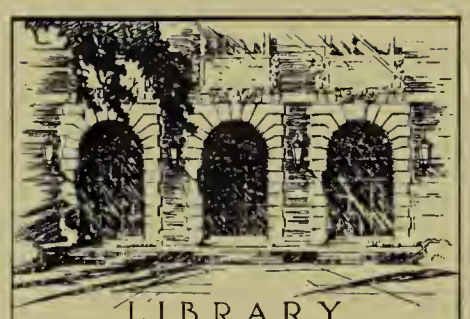


LIBRARY
OF THE
UNIVERSITY
OF ILLINOIS

666.05
CL
V.33-34

REMOTE STORAGE

CENTRAL CIRCULATION BOOKSTACKS

The person charging this material is responsible for its renewal or its return to the library from which it was borrowed on or before the **Latest Date** stamped below. **You may be charged a minimum fee of $75.00 for each lost book.**

Theft, mutilation, and underlining of books are reasons for disciplinary action and may result in dismissal from the University.

TO RENEW CALL TELEPHONE CENTER, 333-8400

UNIVERSITY OF ILLINOIS LIBRARY AT URBANA-CHAMPAIGN

MAR 2 4 1995

MAY 3 0 1995

When renewing by phone, write new due date below previous due date.

L162

THE CLAY-WORKER

Volumes XXXIII-XXXIV,

1900.

F. A. RANDALL & CO.
PUBLISHERS
INDIANAPOLIS, IND., U.S.A.

INDEX TO THE CLAY-WORKER.

VOLUME XXXIII.

FROM JANUARY TO JUNE, 1900.

A.

An Invitation—Detroit to St. Louis..... 13
After Gates' Buttonhole 16
Ancient Egyptian Porcelain..... 16
An Unequal Partnership..... 29
Annex and Annexers, The..... 45
An Old Timer.....180
An Interesting Record of National Commercial Growth 267
Among the Pittsburg Clayworkers.....370, 465, 527
An American Brick Machine Doing Good Work in China.....438
An Effective Dryer—A Convention Echo.462
All's Well at Bucyrus.....546

B.

Brick Roads for Country Highways..... 17
Brickyard Sketches 47
Bugle Call Assemble 49d
Business Methods in Clayworking.....113
Brickyard Pilgrimages 132
Badge of Membership, The.....175
Buttonhole Talks.....240 338, 434, 524
Brickyards at Buffalo, The.....284
Brick Drying 246
Brickmaking Now and One Year Ago....253
Busy Times in the Far Northwest.....264
Brick Pavements Growing in Favor and Must Take a Leading Position.....265
By Way of Comparison.....266
Before—After 284
Brick Pavements in Greater New York.....335, 430, 528
Benefits of Tile Drainage.....362
By the Light of the Kiln Fire.....368, 558
Best Means of Promoting Sales of Tiles.360
Brickmaking at Grand Forks, N. D.....370
Brickyard Boiler Explosion.....371
Brick Manufacturer Commits Suicide, A.373
Brickyard Statistics 372
Building Prospects 372
Brick Machine Manufacturer for Governor, A 435
Building Material in Cuba.....440
Brick Mantels 441
British Clay News.....442
Boston Bakes Brick.....451
Building Interests in Greater New York.446
Brickmakers to Lose Their Jobs.....462
Burning Brick with Lignite.....464
Brick Foundations 466
Brick Plant at the Bottom of the Sea....474
Bond of Brickwork, The.....534
Busy Georgia Brick Plant, A.....535
Brickyard Conundrums 548
Bribers Go to Jail.....550

C.

Convention City, The 11
Canton, Ohio, Paving Brick Industry.... 18
Convention of Stove Lining Manufacturers 23
Committee on Resolutions.....28, 132
Chicago Brick and Building Situation, The.....49e, 263, 343, 476, 546
Chicago to Detroit.....49f
Current Comment 49g, 178, 265, 372, 466, 550
Convention Discussions 49g
Criticism vs. Faultfinding.....49g
Cincinnati Wants the Convention.....110
Clay Age, The 114
Construction of Brick Pavements.....134
Continuous System of Burning, The.....146
Convention Echoes 172, 176
Convention an Agreeable Surprise, The..173
Convention without a Dull Moment, A...173
Culls from the Iowa Convention.....258
Cheaper to Build of Brick Than Wood..264
Change of Base, A.....266, 499
China Workers Welcomed to New York..342
Construction of a Modern Clayworking Plant, The 347
Chemical Reaction Occurring During the Burning of Claywares.....354
Centralization of Power.....373
Capital Brick and Building News.....447, 548
Clay in Modern Building Works.....453
Crowns of Kilns.....542
Common Brick at $25 a Thousand.....546
Check for Municipal Improvements in Indiana, A 550

D.

Do We Make the Best Use of Our Clay Banks 119
Do Not Brick Sell at a Lower Price Than Any Other Building Material.....121
Discipline and Courtesy in the Brickyard 121
Drying Brick with the Heat from Cooling Kiln 124
Down-Draft vs. Up-Draft Kilns for Burning Common Brick.....144
Delegate Who Was Put Off at Buffalo, A 173
Deserved Compliment for the Local Committee, A 174
Detroit Hospitality 178
Disastrous Fire, A.....180
Down-Draft Burning.....252
Don't Toss Your Brick—It Is Expensive.264
Denver Pressed Brick Company, The.....339
Defects of Glazes.....449
Dobbin's Sanitary Vitreous Ware Plant..525
Down in Jersey.....547

E.

Expects the Glad Hand at Detroit..... 23
Editorial Notes and Clippings.....51, 186, 286, 376, 468, 554
Election of the N. B. M. A. Officers, The.106
"Excelsior" Says One Who Has Attended Every Convention 173
Enthusiasm of a New Convert, The.....173
Exhibition Room, The.....175
Experience and Observation of a Clayworker 349
Exact Instruments for Clayworkers.....436, 532
Element of Experience, The.....467

F.

Fire Brick, Their Manufacture and Uses 22, 428, 520
From Clay Bank to Kiln..... 37
Future Tile Business, The..... 38
Five-Year-Old's Impression, A.....172
From a Busy Absentee.....173
From Up in Maine.....262
From the Far Northeast.....264
From Way Down South in Dixie.....264
Fine Picture, A.....265
From Across the Border.....368
Five States in Brickmaking, The.....374
Flue and Chimney Proportion.....464
From the Monongahela to the James....539
French Clayworkers Have an Organ, The 552

G.

Grate Bars or No Grate Bars.....34, 263
Got His Money's Worth.....174
Good Showing for a New Beginner, A...176
Greetings from Philadelphia.....177
Good Roads 235
Garden City Brick Company, The.....238
Good Advice—A Convention Echo.....369
Gus's Fun in Fishing.....374
Guarantees 466
Gray Old Boys in Blue, The.....552
Good Story on a Popular Milwaukee Brickmaker, A 559

H.

Hydraulic Co.'s Family Reunion, The....176
Hollow Building Blocks.....250, 351
How to Figure the Cost of Ware.....359
Hollow Block vs. Frame Houses.....361
Horne Fire the Second.....445
Holland's Brick Industry.....545
How to Get Rich.....536

I.

Illinois Clayworkers' Association Report. 24
Is There Any Advantage Gained by Using Warm Water for Tempering or Pugging Clay 121
Is There Any Economy in Using Exhaust Steam for Drying.....129
Individual Application of Modern Trust Principles to Clayworking, The.....254
Information Wanted About Burning Brick with Lignite 365
Introducing Brick Roadways in England.370
In a St. Louis Sewer Pipe Factory.....538
Inducements to Clayworkers.....544
Importance of Good Construction.....550

K.

Kiln Experiences 142
Kaolin—Its Composition and Use, Etc...243
Kiln Economy 240
Kiln in Continuous Operation for Thirty-four Years, A.....369

L.

Letters from Absent Members.....24, 153
Lessons of Hard Times..... 36
List of Members of the Illinois Clayworkers' Association 45
List of Members of the N. B. M. A.....154
Last Convention the Best of All, The....178
List of Members of the Iowa Association 257
Local Organization Proves Profitable and Pleasant 263
List of Members of the Ohio Association 365
London Letter 544

M.

Modern American Front Brick....14, 241, 340
Maddigan's March 24
Mayor Maloney's Welcome..... 27
Man Behind the Pug Mill, The.....117
Market Side of the Paving Brick Industry, The 132
Manufacture of Tile, The.....253
Modern Manufacturing Plant, A.....444
Monument of Enameled Brick, A.....549
Most Dangerous Trusts, The.....551

N.

New York Brick Market, The.....49f, 261, 380, 450, 541
Notes from Tidewater, Va.....49e, 290, 535
N. B. M. A. Programme, The.....49g
1900 Calendars 50
N. B. M. A. a Great Educator, The.....172
Necessity of Good Roads.....260
News Note from Holland, A.....369
New Location for Fire Clay Manufacturing, A 370
New Paving Brick Testing Machine, A...432
New Field for Brickmakers, A.....441
Nothing the Matter with Kansas.....465
New York School for Clayworkers Elects a Director, The.....467
New York's Use of Brick.....537
Notes from Wellsville, Ohio.....547
Nineteenth Century Miracle, A.....550
New Kind of Chimney Brick, A.....559

O.

Our Exhibit 31, 49h
Outlook for Beginners, The..... 40
Official Announcement..... 49c
Obituary—
Death of Mrs. T. B. McAvoy..... 50
Death of Wm. McGinniss, Glasco, N. Y. 56
Death of Edward Harland, Chicago.... 56
Death of Ward H. Dean, Indianapolis.. 56
Death of George J. Eckert, Reading, Pa. 184
Death of George Tapper, Chicago.....237
Death of D. H. Heager, Dundee, Ill....545
Other Conventions 179

REMOTE
CL
v. 33-34

Origin of Iowa Shales and Clays.....255
Old French Brick Works.....519

P.

President Townsend's Address..... 28
Project for a State Exhibit of Clay Products 32
Pacific Coast News...49b, 184, 292, 382, 474, 560
President Richardson's Annual Address..103
Progress and Prosperity 109
Pow-wow, The 153, 178
Paving Problems, The.....179
Passing of the Esquire, The.....181
President Dennison's Address.....244
Philadelphia Notes 290
President Everal's Annual Address.....346
Practical Application of Science to Clayworking, The 363
Prangley's Brickyard Destroyed by Fire.368
Pumice Bricks 373
Proposition to Try Brick Pavements in Havana, Cuba 434
Plasticity of Clays, The—A New Theory.463
Poor Old Kentucky 549
Prevention of Loss by Fire, The.....551

Q.

Questions for General Discussion.....353

R.

Reports from Members..... 24
Report of Committee on Resolutions.... .....43, 151, 257
Report of the N. B. M. A Convention...103
Report of Committee on Trade Relations 127
Report of Committee on Prof. Orton's Investigations of the Standard Methods of Testing Paving Brick.....141
Report of the Committee on Technical Investigation 142
Report of the Iowa Brick and Tile Association 244
Regarding the Berg Press Patents.....262
Recent Exhibit of Rockwood Pottery Prepared for the Paris Exhibit.....292
Report of the Ohio Brick, Tile and Drainage Association 344
Reports of Committees.....365
Rumbling Sound, A..... 369
Remarkable Brickyard Accident, A.....448
Rockwood Pottery at the Paris Exposition 551

S.

Some Costly Bits of Experiences..... .....21, 239, 366, 439, 531
Successful Convention, A..... 24
Seeing Ottawa 45
Setting Brick in Kiln or Kiln Draft.....123
Saturday Outing, The.....172
Silent Member Speaks, The.....178
Shrinkage and Fusion Point for Certain Iowa Clays 251
Standard Paving Brick Tests.....259
St. Louis Notes.....290, 384, 547
Success in the Manufacture of Tile, A....357
Shrinkage of Clays, The.....358
Starting in a New Territory.....371
Smaller Buildings Prevail in the West...373
Smoke Consumption and Economy of Fuel 452
Science and Every Day Work.....467
Slump in Iron Means Increased Building 549
Satan's Soliloquy 552

T.

Treasurer Stare's Report 43
To the Brick and Tile Maker.....49a
Tough on Gates and Purington.....49h
Trade Literature.....49h, 267, 467
Treasurer Sibley's Report.....106
Tests of Clay Products.....247
Trip to the Tile Works, The.....257
Time and Money Well Spent.....263
Two New Machines.....367
Trusts 373
Terra Cotta in Brick Construction.....427
That Rumbling Sound.....463
Testimony of a Babylonian Brick.....453
Trade Notes 465
Terra Cotta Becoming Popular.....551

U.

Up to Their Old Tricks.....266
Unerring Signs of Prosperity.....467

V.

Very Busy Factory, A.....443

W.

Will Meet Them at Detroit..... 20
Why Burned Clay Is Superior to All Other Materials 42
Will Keep Open House.....49d
Word to Silent Members, A.....49g
With the Cleveland Manufacturers.....49h
What Causes Stiff Mud to Blister? How It May Be Avoided.....120
What We Have Done and How We Have Done It 177
When I Made Brick for Purington.....181
Washing of Clays for Tile and Brick....360
With the Philadelphia Brickmakers.....435
Why Asphalt Is Used Extensively.....462
Wedgwood 522
Women and Strikes.....526

Y.

Young Members to the Front.....179

VOLUME XXXIV.

FROM JULY TO DECEMBER, 1900.

A.

Another Rumbling Sound..... 37
Among Pittsburg Clayworkers..... .....39, 200, 304, 376, 474
Apartment Buildings 41
All's Well at Rome.....125
Asphalt Promoter and His Victim, The..131
Art in Manufacturing.....131
An Important Matter.....132
At the Paris Exposition.....179
An Arkansas Brick Plant.....183
American Society of Municipal Improvements 213
About Clay Building Materials.....283
Arkansas Brick Bats.....378

B.

Brickyard Economy 16
Brick Pavements of Newark, N. J..... 17
Bricklaying Machine a Myth, The..... 28
Buttonhole Talks.....28, 99, 197, 275, 440
Brickmaking in Mississippi..... 30
Brick Interests of Western New York, The 37
British Fire Prevention Company, The... 42
Brick Market, The..... 42
Brickman on His Rambles, A.....102
Brick Business in New England, The....104
Brickmaking in Hoosierdom.....105
Brickmaker Is Born, Not Made, The....108
Busy Tilemakers 113
By the Light of the Kiln Fire..... .....118, 202, 285, 370, 452
Buffalo Brick and Building News..... .....123, 208, 284, 390
Brick Building at the Hub.....130
Brickyard Comics 108
Business and the Postoffice.....185
Brickyard Nearest the North Pole, The..187
Brick Architecture 212
Building on the Sand.....213
Brick Brick Plant, A.....263
Brickmaking in the Colonial Days.....266
Busy Brickmaker, A.....295
Blow Your Own Trumpet.....299
Brick Construction 347
Brick Paving in Des Moines.....354
Brick and Tile Business in Iowa.....376
Brick Dog Dead, The.....368
Brick Pavements 381
Brick Paving in Champaign, Ill.....437
Baltimore Brick, A.....441

C.

Changes in Building Material..... 20
Ceramic Association of the Ohio State University, The 29
Capital Brick and Building News..... .....25, 210, 290, 364, 455
Chicago Brick and Building Situation.... .....27, 122, 208, 293, 376, 460
Correction, A 37
Cincinnati Brick News..... 37
Construction of Water Tanks, The..... 38
Clay in Boiler Furnace Construction..... 38
Could Not Do Without The Clay-Worker 39
Current Comment.....41, 130, 213, 297, 380, 466
Cuban and Porto Rican Investments..... 42
Carelessness Causes Much Loss.....101
Chinese Ceramics 117
Comparative Rates of Insurance.....131
Construction and Maintenance of Brick Pavements 182
Chimneys and Riddle Bottom Kilns.....270
Clayworker's Observations in Havana. A 276, 439
Clay Products in the National Museum..277
Contented Brickmaker, A.....278
Clayworking in Denmark.....281
Cause of Labor Trouble, The.....361
Cause of Variation in the Firing of Kilns and a Remedy for Same.....371, 456
Clayworkers' Thanksgiving, The.....380
Commercial Clubs 381
Causes for Thankfulness.....382
Clay from Top to Bottom.....431
Consumption of Fuel in Burning Brick..445
Canadian Brick Plant, A.....460
Convention Dates 461

D.

Detroit Brick News.....30, 295, 453
Down in Jersey.....50, 209, 294, 378

E.

Exact Instruments for Clayworkers..... 22
Editorial Notes and Clippings..... .....52, 136, 218, 302, 384, 476
Escaped the Dreadful Storm.....294
Electric Power for Operating Brickyards.298

F.

Fire Brick; Their Manufacture and Uses 35, 115, 184, 268, 350, 434
Frit Kilns 106
From the Kentucky Metropolis...119, 210, 377
Fine Deposit of Kaolin, A.....119
Fire Insurance Rates and Equities.....130

G.

Glorious Fourth, A..... 43
Great Ohio Brick Plant, A.....109
Good Times and Some Hobbies.....109
Good Opening for Experienced Brickmakers 123
Got His Money's Worth.....123
Gold Bricks and Clay Testing.....181
Good Roads a Paying Investment... 196
Good Roads—The Wheel Track Project..293
Good Business and Good Business Resolutions 294
Good Point to Locate a Brick Plant, A...295
Good Times in Georgia.....296
Generator Gas as a Source of Power on Brickyards 373
General Prosperity 381

H.

Home Comfort Swing, A..... 33
Hygrometer and Pyrometer, The.....199
Hunt, William H.....357
Hoosier Brick Metropolis.....358
Hail to the Prophet of Wabash.....382
Holiday Greetings 466

I.

In Philadelphia Brickyards..98, 198, 279, 454
Increase of Wealth; Its Cause.....379

K.

Kaolins and Fire Clays of Europe, The.. .....291, 361

L.

LaBrique 24
Latest Modification of Tunnel Kiln as Constructed by Moeller & Pfeifer.....186
Little Feller's Stocking, The.....468
Little Bill Jinks.....468

M.

Modern Clayworking Factory, A..... 36
Midsummer in Maine Mudyards.....122
Midsummer Meeting of National Stove Lining Manufacturers' Association.....200
Manufacture of Brick in Roumania, The.211
More Prosperity at Galesburg.....298
Mr. Tiffany on Chimneys.....459
Meeting of the Paving Brick Commitee..466

N.

New York Brick Market, The..... .....46, 120, 222, 306, 388, 458
Not in the Trust.....123
New York School of Ceramics and Clayworking, The 132, 214

6
63740

Notes from Tidewater, Va.....294, 369, 461
Notes on the Use of Producer Gas in Burning Brick 366
Next National Convention, The.....380
Notable Clay Products and Exhibits at the Paris Exposition 433
New Continuous Kiln, A.....447
National Convention, The.....467

O.

Obituary—
Death of James H. Beggs, Wilmington Del. 40
Death of James W. Carson, Shawnee, Ohio 188
Death of Richard C. Washburn, Saugerties, N. Y.....443
Death of H. C. Carroll, Philadelphia, Pa. 443
Death of Charles Sheppard, Montreal, Canada 443
Original Shirt Waist Man, The.....133
Official Announcement.....296, 369, 451
Outlook in Maine.....459

P.

Publicity and Happiness..... 15
Philadelphia Bricklets 34
Prices of Union Workmen..... 51
Prices of Building Materials..... 42
Pacific Coast News....48, 121, 224, 308, 377, 470
Philadelphia Pavements 107
Philadelphia Pavements and Paving Blocks 298
Pretty Fair World After All.....299
Philadelphia Brick and Terra Cotta.....349
Possibility of a Timber Famine, The....467
Prospecting.....448
Prosperity in Georgia.....365
Personal Mention 379
Prehistoric Clayworkers 444

Q.

Query, A 293

R.

Royal Saxon Porcelain Manufactory, The 11
Reveries of a Satchelor..... 34
Roofing Tiles 97
Right Man in the Right Place, The.....107
Russian Brick Industry, The.....112
Rational Method of Burning, A.....293

S.

Science in Clayworking.....32, 41
Seger Cones; Are They Practical.....110
Summer Meeting of the American Ceramic Society 124
Serious, But Not a Fatal Accident.....131
Southern California Brickmaking and Brickmakers 271, 362
Successful Chicago Brickmaker, A.....283
St. Louis Notes.....309
Spectre of Sand Brick, The.....248
Some Curious Old Water Coolers Made in America 352
Secret Information 442

T.

Trade Literature.....42, 214, 298, 381
Tiles in Nature 95
Trusts and Small Brick Factories, The.. .....201, 265, 357
Transactions of the American Ceramic Society 214, 298
Trade Notes 215, 299, 382
Terra Cotta in Architecture.....274
Treatment of Tenacious Clays.....374
That Clay Bank.....432

U.

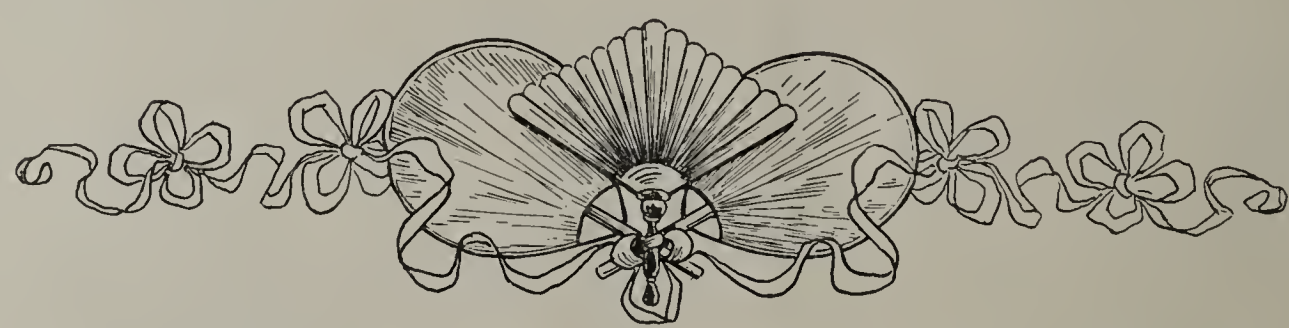
Utilization of Waste Material and Forces.187
U. S. Potters' Association.....450

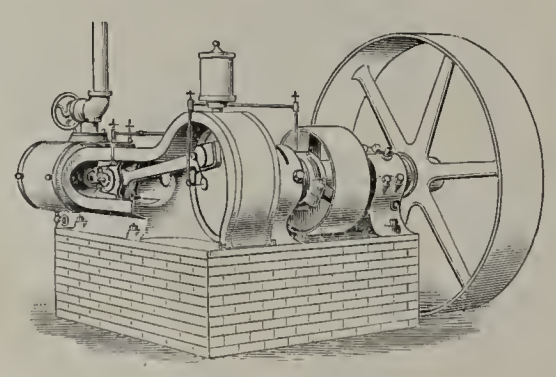
V.

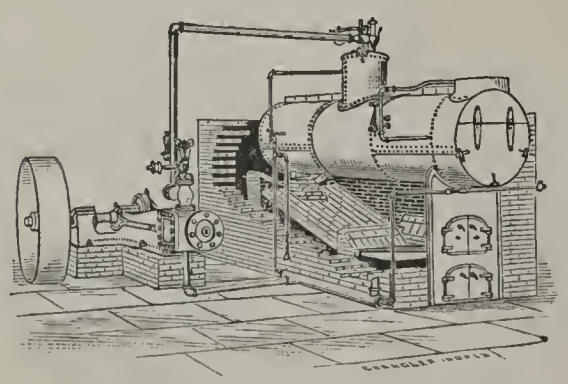
Vitrified Brick Pavements in Philadelphia.....100, 190, 266
Voice from Texas, A.....120
Visit to Buffalo, A.....121
Valuable Material for Potters, Sewer Pipe Manufacturers, Etc.....292

W.

Wants a Partner to Help Manage a Growing Trade 459
Webster and Nephew Plant..... 21
Wants the Best Kiln for Common Brick.119
Way Down in Maine.....208
Weak Side of Asphalt Pavements, The..213
Watch That Burner.....282, 353
Wooden Block Pavements an Expensive Luxury 297







Chandler & Taylor Company

INDIANAPOLIS, IND., U. S. A.

An establishment where quality is the first consideration and where prices are based on a fair and reasonable advance above the cost of manufacture.

Manufacturers of

Complete Steam Power Outfits

For the Operation of

CLAYWORKING MACHINERY.

CATALOGUES SENT FREE ON APPLICATION.

Table of Contents, Page 51.

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII, No. 1. INDIANAPOLIS, IND., JANUARY, 1900. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.

For Sale.

One Second-hand Chambers Automatic End-cut Brick Machine, 25,000 Guaranteed Daily Capacity. Taken in trade from Customer purchasing a larger Chambers Machine. Guaranteed in thorough repair and offered subject to trial and approval.

Bargain for Quick Buyer.

Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

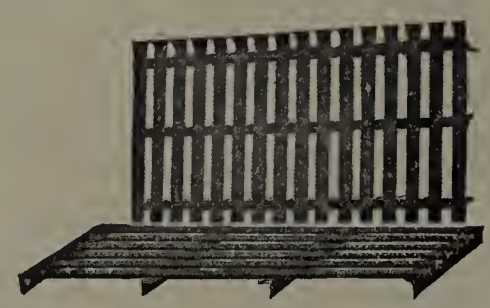
We are the Largest Manufacturers of Dryer Cars in the World.

Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.

No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.

No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet 7 inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name.	Page.
American Clay-Working Mach Co, The	86, 87
Anderson Foundry and Mach. Works	6, 71
Chisholm, Boyd & White Co,	4, 5
Chicago Brick Machinery Co	8
Many, Frank B	60
Fernholtz Brick Machinery Co. The	9
Ross-Keller Brick Machine Co.	7
Western Machinery & Supply Co	60

Brick and Tile Machinery.

Name.	Page.
Adrain Brick & Tile Machie Co.	65
American Clay-Working Mach Co., The	86, 87
Anderson Foundry and Mach. Works	71
Baird and Son, H. C	63
Brewer, H. & Co	78
Chambers Brothers Co	1
Chicago Brick Machinery Co	8
Eastern Machinery Co, The	90
Fate & Co., The J. D	75
Freese, E. M. & Co	88, 89
Henry Martin Brick Mach. Mfg Co, The	79
Hensley, J. W	3
Horton Mfg Co, The	80, 81
Kells & Sons	63
Leader Mfg. Co, The	72
Madden & Co	61
Mock & Co., Jas. F	77
Ohio Ceramic Engineering Co., The	92
Potts & Co., C. & A	58b
Prangley, James	71
Raymond Co., The C. W	52
Steele, J. C., & Son	70
Stevenson & Co	91
Taplin, Rice & Co	8
Wallace Mfg. Co, The	84, 85
Wellington Machine Co, The	55
Wiles Co., A. M. & W. H	70

Brick Kilns and Dryers.

Name.	Page.
Alsip, S. H	65
American Blower Co, The	92
Bushong, M. M	69
Carson, J. W	64
Eudaly, W. A	69
Haigh, H	68
Illinois Supply and Construction Co, The	76
Morrison & Co., R. B	68
Phillips, S. G	59
Pike, E. M	60
Reppell, L. H	68
Standard Dry Kiln Co, The	10
Yates, Alfred	62

Brick Yard Supplies.

Name.	Page.
Atlas Bolt & Screw Co, The	2
Arnold, D. J. C	62
Buhl Malleable Company	59
Cleveland Car Co	57
Caldwell & Son Co., H. W	61
Carmichael, T. W	63
Carnell, Geo	70
Coldewe & Co., G	63
Cox, Geo. S	64
Duplex Heating & Machine Co.	65
Elder & Dunlap	64
Frost Engine Co	73
Harding & Gray	62
Harrington & King Perforating Co, The	3
Henry Martin Brick Machine Mfg. Co, The	79
Horton Mfg. Co, The	80, 81
Jeffrey Manufacturing Co, The.	62
Kendall & Flick	..
Marion Steam Shovel Co	72
Main Belting Co	59
Mershon & Co., W. B	60
Newton, A. H	58
A. C. Newton	62
Phillips & McLaren	60
Rockwood Mfg. Co, The	61
Turner, Vaughn & Taylor Co	92
Vanduzen Co., The E. W	60
Williams Patent Crusher and Pulverizer Co	9

Miscellaneous.

Name.	Page.
Burt Manufacturing Co	51
Chesapeake & Ohio R. R	64
Clinton Paving and Building Brick Co., The	67
Coaldale Brick & Tile Co., The	66
Cotton Belt Route	63
Dean Bros. Steam Pump Works	62
Dover Fire Brick Co	64
Evens & Howard	61
Gabriel & Schall	62
Green & Hunter Brick Co	66
Great Rock Island Route	64
Henry Carey Baird & Co	61
Harper-Norton Shale Brick Co The	66
Higley & Co, J. L	67
Indianapolis Engraving and Electro Co	61, 62
Indiana, Decatur & Western	68
Illinois Central R. R	65
Joseph Dixon Crucible Co	68
Lake Erie & Western	63
Meyenberg, Franz P	58
McAvoy Vitrified Brick Co	67
New York Brick and Paving Co	66
Osborne, W. R	62
Philadelphia Commercial Museum, The	64
Purington Paving Brick Co, The	67
Terre Haute Brick and Pipe Co.	67
Wabash Railroad	74
Westbrook & Wells	60
Ads., Small Wanted, For Sale, etc.	

Mention the Clay-Worker
WHEN WRITING TO ADVERTISERS
Mention the Clay-Worker

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

Samples or blue prints with prices furnished on request.

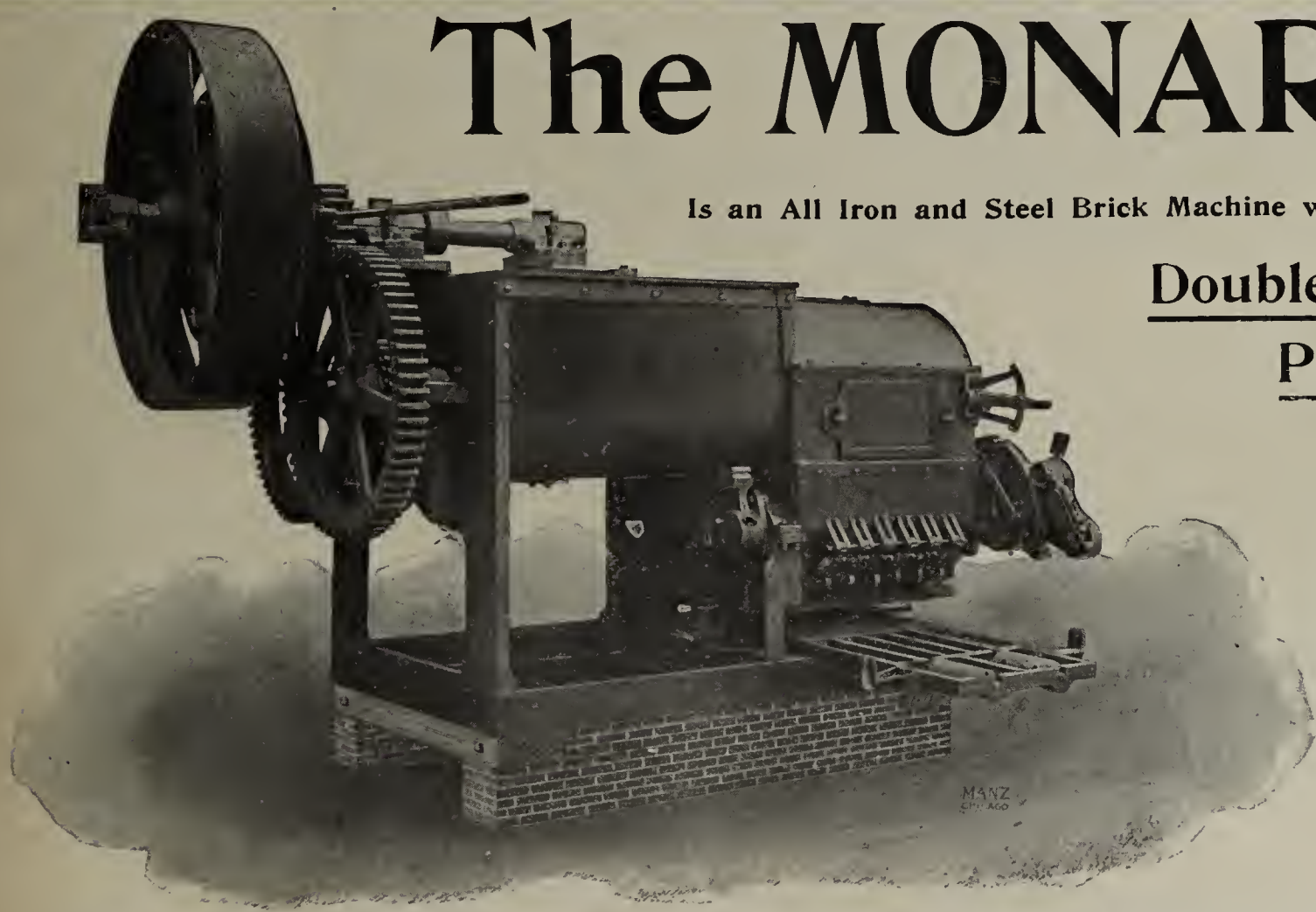
THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.

• • •



SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown. South Africa.

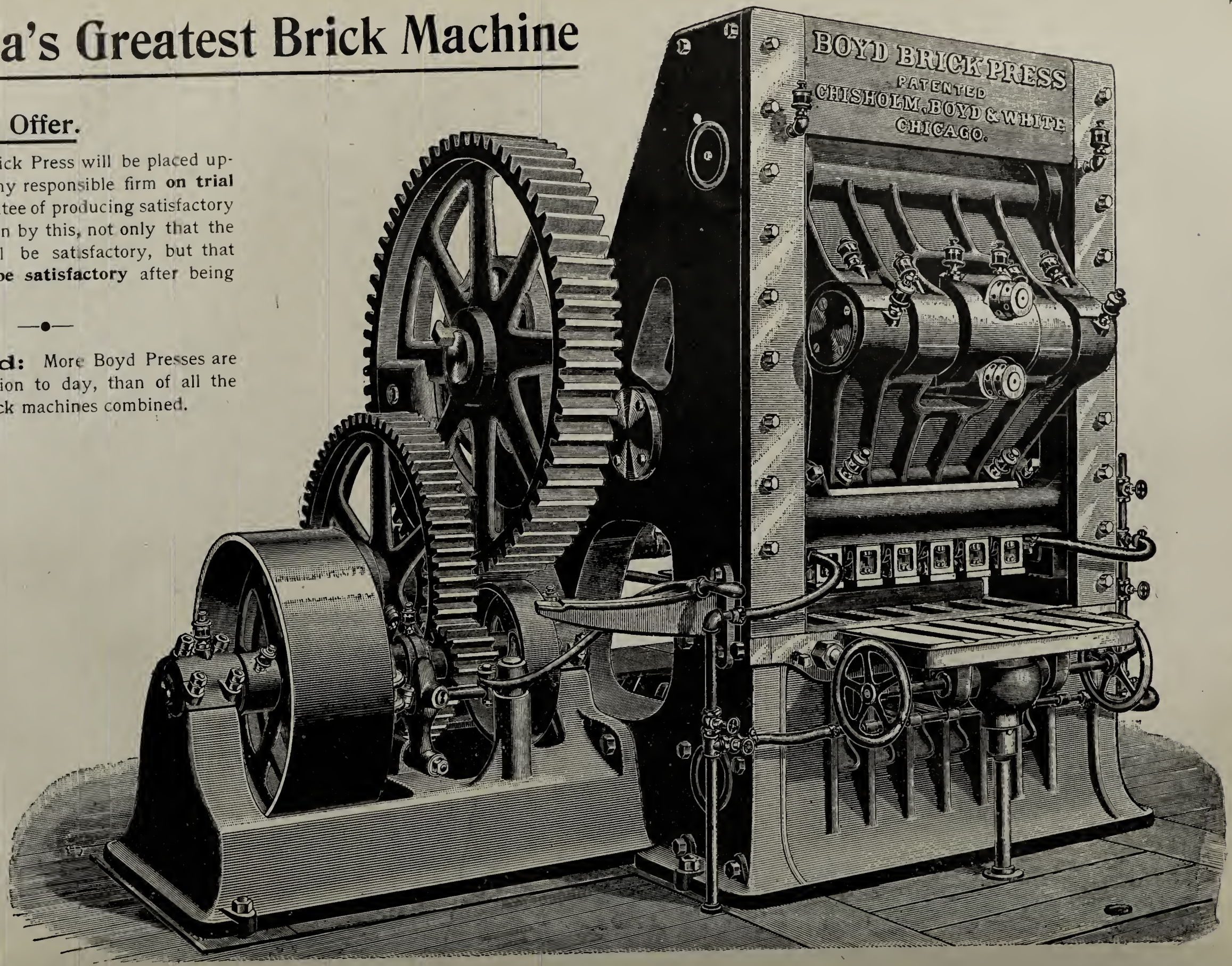
America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

—•—

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Powerful Pressing Mechanism of the Boyd Press Lasts Forever.

Great for Strength.

The engraving shows the heavy forged steel Side-Bars, the Toggles, the upper and lower Crossheads, with the plungers in position. These comprise the "pressing mechanism" of the Boyd Brick Press, and take all the strain exerted in pressing the bricks in the molds between the plungers. They can never wear out and cannot be broken. These pressing parts are suspended upon the lifting levers, and the side frames of the press only guide the side-bars in their upward and downward movements.

Great for Beauty.

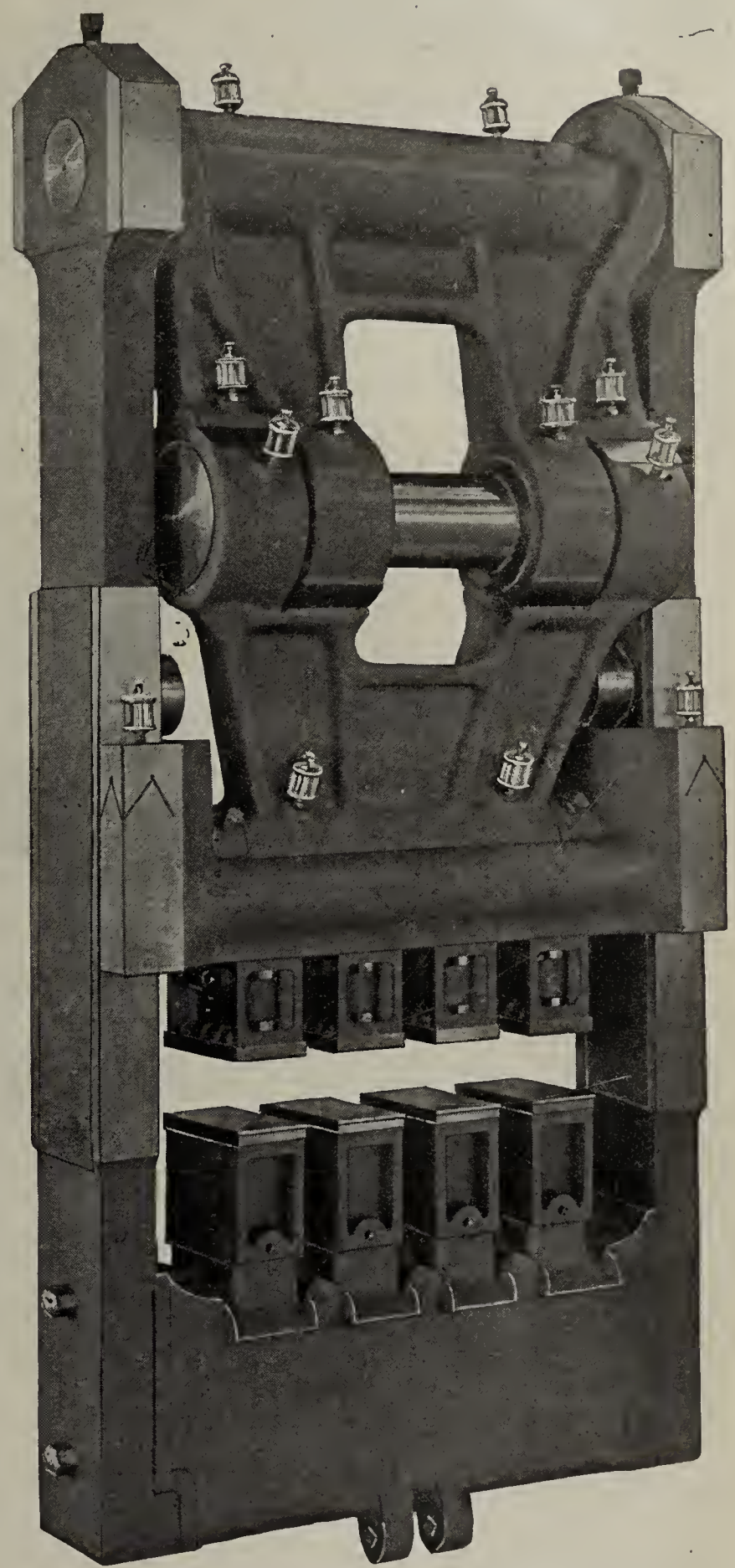
The symmetrical design of the Boyd Brick Press gives it the strength and beauty for which it has always been distinguished. The housing or stand, which contains the driving pulley and intermediate gears, is bolted to the main frame as shown. Each press rests on the floor line, is self-contained and does not need to be bolted or fastened to its foundation.

Noiseless.

No strain is exerted upon the side frames of the press. The movement of the Boyd Press is noiseless and without jar or shock. No buffers, air cushions, hooks, latches, or other uncertain mechanism are required or employed. There is nothing to get out of order. The mold liners are the same for and will fit each size press. They can be taken out and replaced, or ornomental molds set in without removing any of the working parts of the press.

No Pitman-Lever.

The Modern Boyd Press has no **Pitman-Lever,** though we have the only valid Patents on Pitman-Lever Presses. Eight and ten years ago we built Pitman-Lever Presses, but none since 1891, when it was superseded by the Improved Boyd. Nobody now wants a Pitman-Lever Brick Press, can't afford to use one. We will tell you why if you want to know. So could some of our first customers.



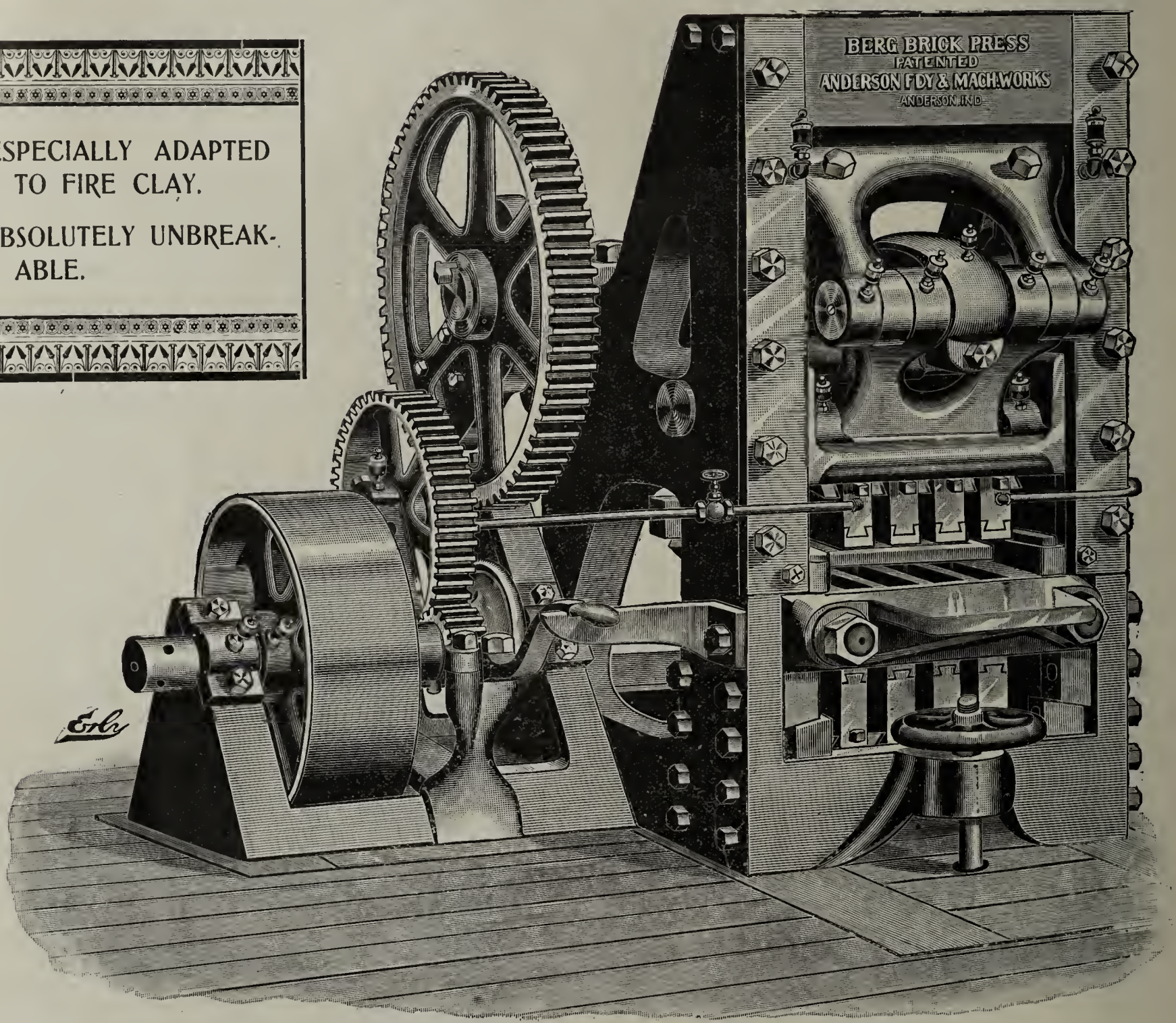
CHISHOLM, BOYD & WHITE COMPANY,

OFFICE AND WORKS: 57th and Wallace Streets. CHICAGO, U. S. A.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

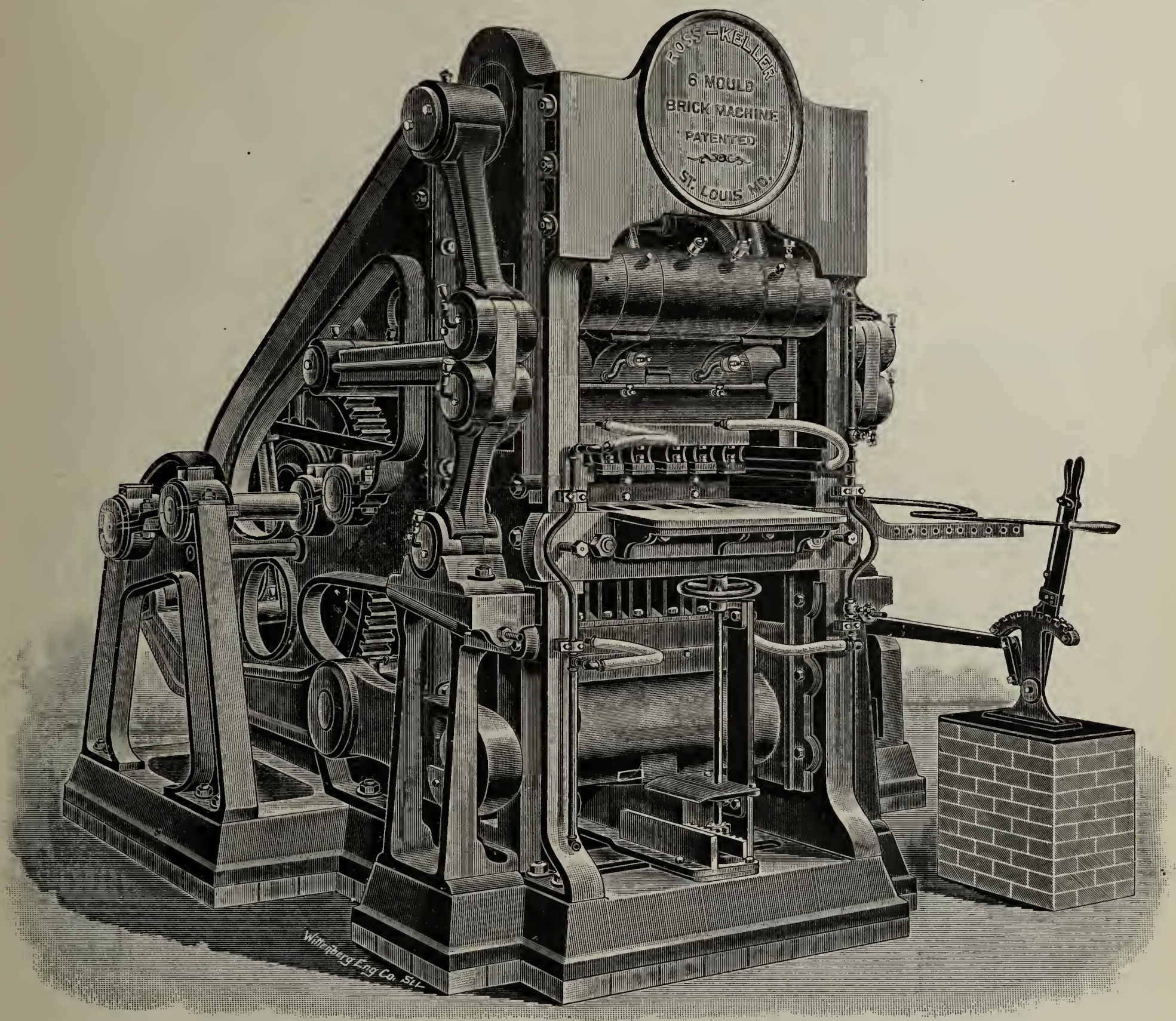
MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

The Latest Improved
Ross-Keller TRIPLE PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 35,000 to 40,000 brick per day.

BRICK SET IN KILN DIRECT FROM MACHINE.



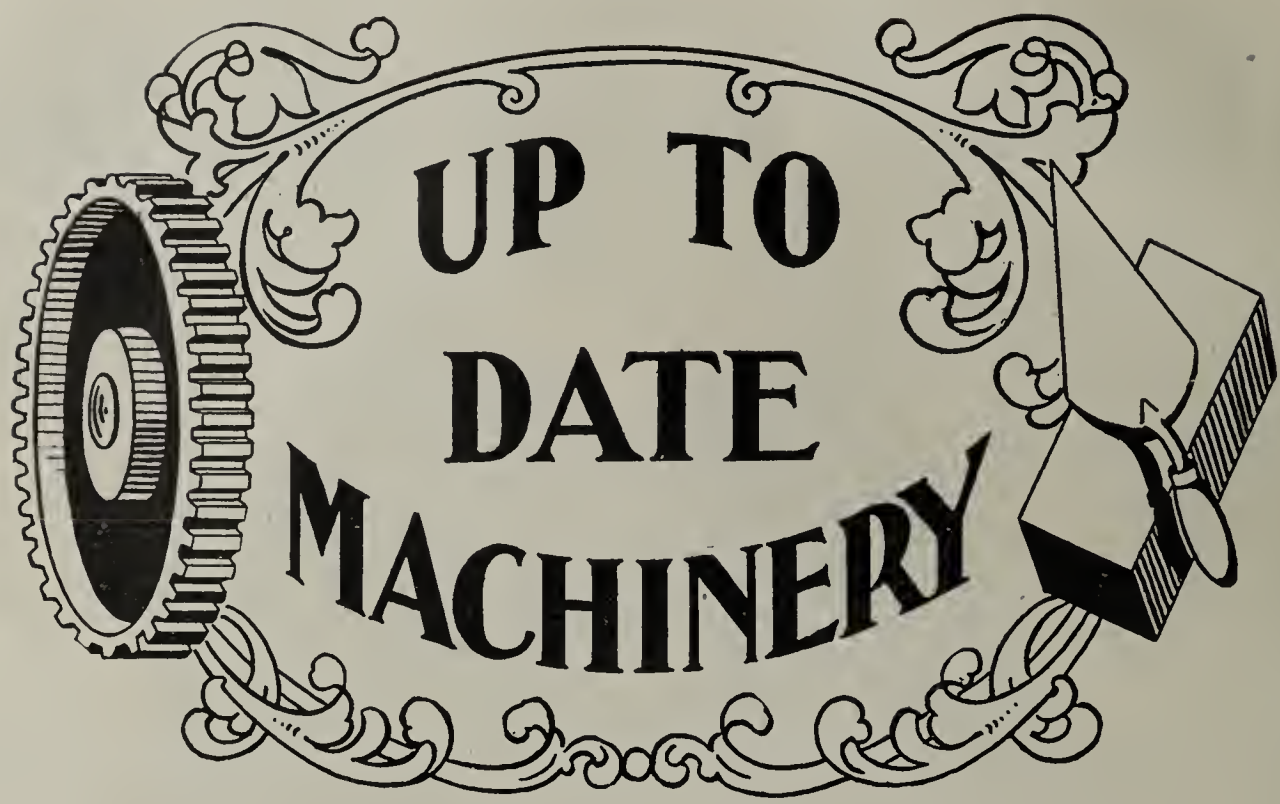
"The Proof of the Pudding is in the Eating."

THE ROSS-KELLER BRICK MACHINE is not "pronounced by the United States Government the highest development of the **Art**" of brick making machinery. But the United States Government **DID** on the 24th day of October, 1898, "pronounce" to the world that the ROSS-KELLER MACHINE was the best "development" to be used by it for the manufacture of forty million pressed brick to be used in the construction of the new United States Penitentiary at Ft. Leavenworth, Kan., as was evidenced on that day, when bids from all of the makers of pressed brick machinery were opened, and after a thorough examination of the different machines in practical operation, **DID** purchase at the highest bona fide bid, the ROSS-KELLER MACHINE. For particulars regarding the working of this machine during the first year, we respectfully refer to the Hon. R. W. McClaughry, Warden U. S. Penitentiary, Ft. Leavenworth, Kansas.

Two of our six mold machines are used by the Green & Hunter Brick Co., Thurber, Texas, the finest plant in the United States—If our machine is good enough for Uncle Sam and such plants as the Green & Hunter Co., why is it not good enough for you? **For Price and Full Particulars Address**

Ross-Keller Brick Machine Company,

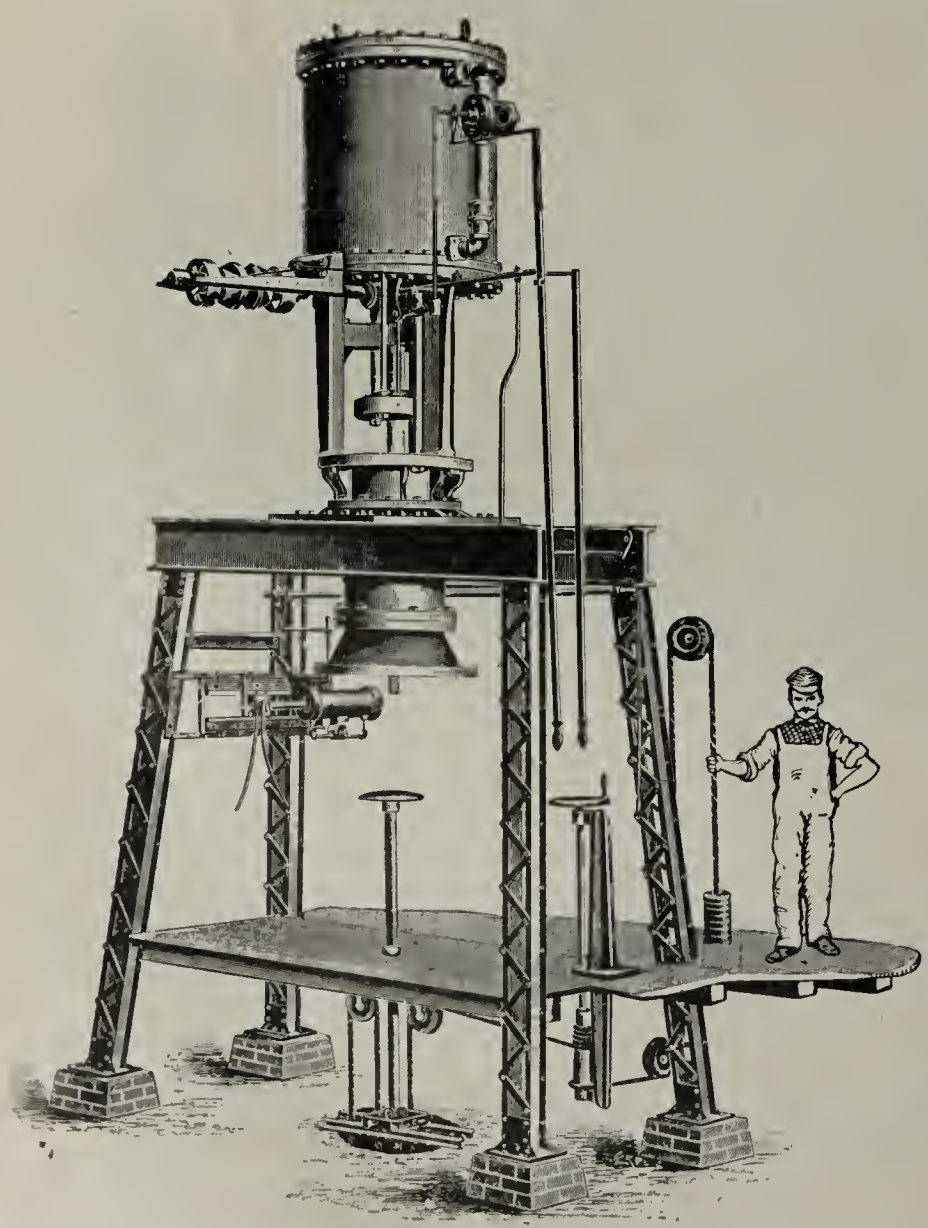
915 and 916 Holland Building, **ST. LOUIS, MO., U. S. A.**



When Buying New Machinery

Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front and Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.



Modern Clay Working Machinery.

We Furnish Complete Equipments for Sewer Pipe, Drain Tile and Fire Proofing Factories.
OUR DIES for Sewer Pipe, Drain Tile and Fire Proofing are Unequalled.

Steel Frame Dry and Wet Pans.

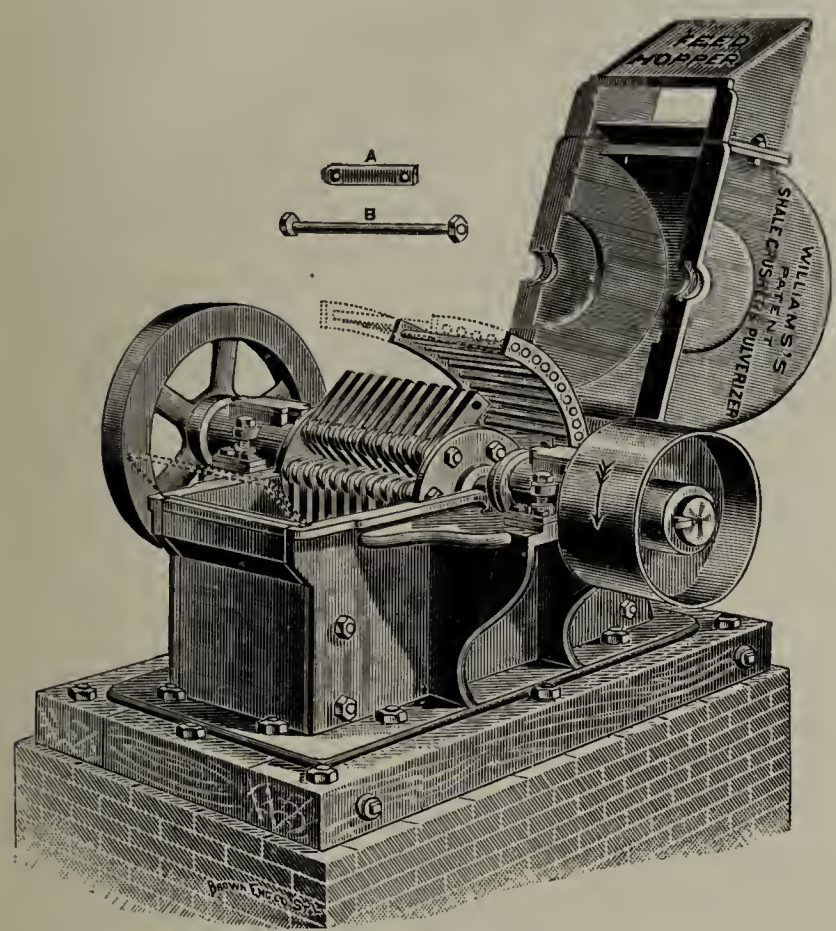
CATALOG ON APPLICATION.

TAPLIN, RICE & COMPANY,

Akron, Ohio.

The Williams Patent Crusher & Pulverizer Co.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

FOR FURTHER INFORMATION WRITE TO

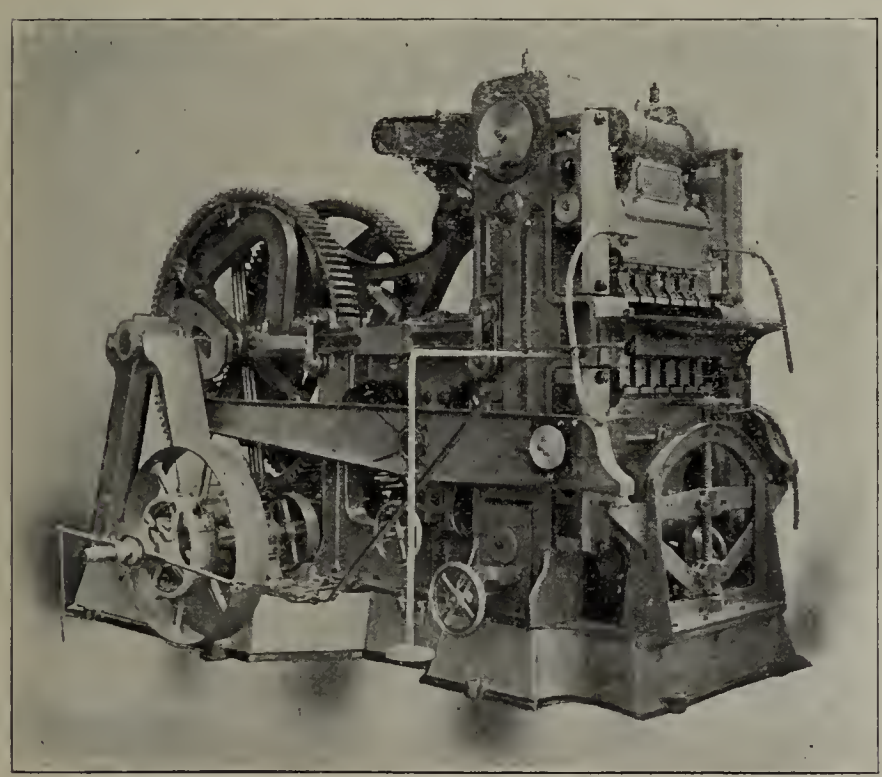
The Williams Patent Crusher and Pulverizer Company,

2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Washington Life Bldg.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for { STRENGTH, DURABILITY and SIMPLICITY.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market, requiring only 6 to 7 horse power to operate the largest 6-mold press. All parts subject to strain are made of the best bessemer steel, and can be seen and gotten at easily. The thickness of the brick can be changed and regulated without stopping the press, and every press is fitted with the Fernholtz mold Box, which is admitted to be the best in use. For fine pressed and ornamental brick, this machine cannot be equalled, the pressure on, and movement of the clay in the mold being such as to prevent granulation, and insures the most perfect product possible. We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer** in our own factory and guarantee them fully.

The opinion of those using our press and full information on application.

Dealers in BRICKYARD SUPPLIES.

The Fernholtz Brick Machinery Co.,

WESTERN UNION CODE USED:
CABLE ADDRESS "FERNBRICK."

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

The Standard Drier

Can be seen at the yard of the F. H. Wolf Brick Co., by Brickmakers attending the convention of the N. B. M. A. in Detroit, February 7th to 10th.

We print below a letter from these people, giving their opinion of the Soft Mud Drier which we erected for them last summer. But MORE CONVINCING evidence of the merits of THE "STANDARD" is the fact that they have given us an order for another Drier to dry the output of their Stiff Mud Machine.

"DUPLICATE ORDERS ARE A TEST OF WORTH."

Brickmakers who are interested in the drying of Brick made by either the Soft or the Stiff Mud process are cordially invited to visit this plant and inspect our Driers.

The F. H. Wolf Brick Co., Detroit, Mich.

THE STANDARD DRIER which you put in for us last summer has been thoroughly tested and gives entire satisfaction. We are pleased to say further that it has far exceeded our expectations.

Your guarantee has been MORE than fulfilled. We will take pleasure in showing our Drier to any one interested and you are at liberty to refer us to all who are looking for a successful and economical Drier.

The F. H. WOLF Brick Co.
F. H. Wolf, President.

Detroit, Mich., October 30, '99.

Our New Catalog, No. 50. is ready for distribution. It is replete with information of interest to Brickmakers and should be read by everyone who has any thought of buying a Drier now or in the future.

We will exchange it for your Name and address

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. XXXIII. INDIANAPOLIS, IND., JANUARY, 1900. No. 1

Written for The Clay-Worker.

THE CONVENTION CITY.

Points of Interest to Brickmakers In and About Michigan's Metropolis—Detroit knows How to Entertain her Guests, and the Keys to the City will be Turned over to the Clayworkers February 5th.

DETROIT, "THE CONVENTION CITY of the world," is preparing a hospitable reception for the members of the National Brickmakers' Association. Much experience has made our people adept in the art of entertaining large bodies of visiting delegates, and we set up as many claims for excellence in this line as the manufacturer of any brickmaking machine that exploits his wares in the columns of "The Clay-Worker."

Detroit is an ancient city, and to those of our guests who delight to delve in the musty pages of the past a rare treat is in store, for the city's history reads like a romance, and many monuments yet remain to recall the years when the Indians, the French, the British and our own forefathers fought bloody battles for its possession.

The Detroit Museum of Art.

The flags of three nations have floated over it, and each in turn has been humbled. But out of the chaos of war a country of peace and plenty has sprung up. The frowning guns of old Fort Wayne now guard a modern city. A detailed description of Detroit would necessarily far exceed even the generous limit as to space that "The Clay-Worker" has set, and so we will merely give an index of our claims, and our guests, when they visit us in February, can make the broad survey with their own eyes.

Detroit has the widest, best paved and best lighted streets of any city in the country.

According to the census of 1890, forty-two of every one hundred families in Detroit owned their own homes—a ratio equaled by no other city of equal or greater size in the United States. A population composed so largely of home owners, it is thought, is more stable, conservative and law abiding than a transient people, and property interests are more secure.

Manufacturing industries build the modern city. In no other way can a large, concentrated population be supported. In 1897 Detroit contained factories that had a capacity of over 57,000 employes. Since that time many new factories have been erected and many old ones enlarged.

The following facts regarding Detroit demand attention:

Population, 350,000.

Death rate, 11.9 per thousand.

Area, 28½ square miles.

River frontage, nine miles.

Net general debt, July 1, 1899, of only $3,296,401.49.

Property owned by the city, $25,684,539.43.

Assessed valuation in 1899, $216,971,000.

Public schools, 66.

Private schools, colleges, etc., 94.

Parks, 21; acres, 900. Paved streets, 260 miles. Sewers, main and lateral, 461 miles. Electric street railways, 180 miles. Public library, 155,000 volumes. Newspapers and periodicals, 80. Churches, 190. Banks, 25. Bank clearings for year ending July, 1899, $381,968,114. Fire department, 408 men. Water-works plant, costing $6,920,467, with a capacity of 103,000,000 gallons per day. Municipal lighting plant, with 1,911 arc and 3,900 in-

candescent lights. Largest seed house in the world. Largest stove factories in the world. Largest chemical laboratory in the world. Largest varnish factory in the world.

And last, but not least, more conventions than any other city in the world. Eighty-one State and national conventions were booked for Detroit in eight months.

Detroit is a well-built city, and the material most commonly used is brick. In a radius of half a mile from the City Hall are grouped a number of mammoth structures that, in point of architectural beauty and strength of construction, are unrivaled in the Middle West.

The fourteen-story Majestic Block, owing to its superb location, is one of the first objects to catch the visitor's eye, and from its roof the whole panorama of Detroit, the great river and the villages that line the Canadian shore are spread before the charmed observers.

The following details regarding the Majestic Building give an idea of the high class of architecture that obtains here. Its total height from sidewalk to cornice is 211 feet, making it the highest commercial structure in Michigan and the tallest department store in America. It was completed in 1897 at a cost of $850,000; the ground cost $700,000, a total investment of a million and a half dollars.

Interior of the Detroit Museum of Art.

The site, which is bounded on the east by Woodward avenue and on the south by Michigan avenue, faces the Campus Martius, the hub in which focus the leading thoroughfares of the city. From this corner every suburban and city car line radiates—a valuable point for visitors to remember who wish to navigate about town without a guide.

The City Hall is opposite this structure, and still further across, looking in the same direction, is a big ten-story brick structure known as the Hammond Building. In the Hammond Building are gathered more brick men than in any other building in town, and visiting clayworkers will be able to find friends in almost any room they have a mind to enter over there.

The Hammond building is located on the corner of Griswold street and Fort street, west. On Griswold street, in the rear of the Hammond Building, is the new Union Trust Building, a beautiful brick structure. North, on Griswold street, may be found the eight-story brick Whitney Opera House, and a block farther north brings the visitor to the next largest brick structure in Detroit—the Chamber of Commerce.

One of the greatest attractions that Detroit has to offer to pleasure-seeking visitors is the beautiful Belle Isle Park. This island park is the recreation ground (summer and winter) of all Detroiters, and one of the most beautiful public parks in America. Its broad drives and pleasant foot paths, its beautiful flower beds and lily ponds, its pleasant groves and tangled wildwood, its swings and ball diamonds, its canals and artificial lakes, make it a recreation ground without equal. Visitors find here all the conveniences for a pleasant afternoon—casino, pavilion, row boats, bicycles, carriages and palatial pleasure steamers. In the winter months the artificial lakes are kept clear by the city for skating and ice yachting and other winter sports. This one park has cost the city over $1,300,000.

Navigation on the Detroit river is kept open all the winter through by the car ferries, that bring freight and passenger trains across the river from Canada, and the passenger ferries of the Detroit, Belle Isle and Windsor Ferry Company, that ply between Windsor and Detroit. Any visitor desiring to taste the delights of an Arctic voyage should take the trip to Windsor. If there happens to be an ice jam in the river during the week of the Convention this is a trip that should not be missed, as it is an experience of a lifetime. Canada has many objects of interest to visitors, and the "trip to Europe" is quite the thing. The round trip costs 10 cents, and ten tickets may be obtained for a quarter. Through this river, or, rather, strait, passes all the commerce of the lakes from the Northwest to the sea. The grain from Duluth and Chicago, the copper from the Michigan mines, the salt from the Saginaw valley and the shores of Lake Michigan, the ore from the mines of Michigan, Wisconsin and Minnesota and the lumber that is destined to move from the Northwest to the sea all pass before the doors of Detroit in continuous procession during eight months of the year, in quantity half a dozen times greater than the tonnage of the Suez canal, equal to the commerce of the Thames and the Mersey put together, and greater for the limited period of navigation than the commerce entering New York harbor in a full year.

Detroit's great advantage is her water transportation, as it is the cheapest form of transportation.

Detroit has many public institutions that are worthy of the attention of our Convention visitors, and chief among these is our celebrated Museum of Art. Here are gathered together art treasures from all over the wide world, including many costly exhibits that will be of especial interest to the visiting clayworkers.

Director A. H. Griffith, of the Museum of Art, has very considerately placed the Museum at the disposal of the National Brick Manufacturers' Association upon the occasion of their visit to this city in February, and will personally conduct members through the vast establishment. As Director Griffith is an artist of world-wide reputation and a most charming lecturer on art subjects, the visiting clayworkers will undoubt-

edly find this portion of their entertainment programme one of its most delightful features.

Director Griffith, in speaking of his art treasures in connection with the visit of the brickmakers, said: "Of all the arts, that of the potter is undoubtedly the most ancient. No material used by man seems so universally distributed over the earth, and it is possible that the very first fire built was over a clay bank or spot, and that the heat from it revealed the properties which would make it valuable to man when fashioned into form by his nimble fingers.

"In every excavation where there is found the least trace of prehistoric races the fragments of pottery bear evidence that it was an important part in their life and domestic economy. The form and decoration are all matters of interest and study to the archæologist and student. In later times kings and the great men of earth have fostered and encouraged this art, which so pre-eminently enters into the everyday life of every nation and of every people. In its crudest form it is found among the savages, while the more enlightened and skillful delight in the many beautiful shapes and sparkling glow of varied glaze that reveal the happy blending of the colors of agate and gem.

"Centuries ago Spain, Italy and the Orient brought their pottery to a high state of perfection, and many an old Moorish tile holds a post of honor among the treasures of the collector. France long held the palm for the transparency and beauty of decoration lavished upon plate and vase. The name of Dresden and its symbol of crossed swords has been one to conjure with.

"Wedgwood, Flaxman and Spade placed the wares of England in the front of nations, and the work of her potters is known in every land; even though she despised us during the revolution, she was glad to supply us with that splendid line of old blue dishes known as colonial, which is both the desire and despair of the modern hunter. Nor must we forget the old Delft of Holland, with its quaint dishes, decorated with still more quaint Dutch scenes.

"During the last decade America, with its push and energy, its inventive genius, seems destined to lead in this as well as in other achievements. The potteries of East Liverpool and Jersey City are fast supplanting the best of foreign makes, while the Rockwood and Biloxi ware hold the very highest place in decoration, glaze and form.

"This change has been largely brought about by the opportunities afforded to the potters by exhibitions and large collections, where they might study and improve upon the work of other nations.

"The Detroit Museum of Art affords just such an opportunity to every visitor. Here they will find a fair, and often fine, example of the many different kinds of ware produced in America, Europe and the Orient. Queer modeling, turning and decoration, odd effects in glaze and finish, are to be found in endless variety, enough to bewilder any one but a student."

The Heart of Detroit—The City Hall is to the Left and Soldiers Monument to Righ—The Sky-Scraper is the Majestic.

AN INVITATION—ST. LOUIS TO DETROIT.

THE INTEREST in the Annual Convention of the National Brick Manufacturers' Association seems greater than ever before, and in all likelihood there will be a larger number of enterprising clayworkers at Detroit, Mich., Feb. 7 to 10, than have ever before gathered at any one place.

A number of brickmakers and machinery men of St. Louis, under the leadership of Anthony Ittner, the veteran brickmaker of this ctiy, who has attended twelve of the thirteen previous Conventions, expect to have a very pleasant time, both at the Convention and on the journey to and from Detroit, for a lively party is being organized. We leave St. Louis Tuesday, February 6, at 8:40 p. m., over the Wabash Railroad, which affords the best possible service to the convention city. Special sleeping cars will be provided and will land the party without change of cars into the Union Station at Detroit, at 9:40 a. m. Wednesday. As we believe thoroughly in the old adage, "The more the merrier," a most cordial invitation is extended to all brickmakers from beyond points, or on the way, to join us, and we will try our level best to make each and every one happy.

For berths in sleeper, etc., write H. V. P. Taylor, A. G. P. and T. A. of the Wabash R. R., St. Louis. He is used to the business and will locate all comers satisfactorily. Every brickmaker who can join the party will be welcomed cordially.

St. Louis, Jan. 13, 1900. T. P. PLUMRIDGE.

Written for The Clay-Worker.

MODERN AMERICAN FRONT BRICK. No. 24.

DETERMINATION OF VITRIFICATION AND FUSION POINTS.

AFTER DISCUSSING the chemical and physical characteristics of clays as we have done, we ought to experience no trouble in understanding that the refractory value of our materials depends upon chemical as well as physical considerations. The presence of soda, potash, lime, magnesia and iron in a clay always reduces its refractoriness, as does also an excess of silica, but only at high temperatures. Alumina, on the other hand, invariably increases the fire-resisting property. These general chemical facts are modified by the structure of the clays in regard to fineness of grain, and we may say, briefly, that coarse-grained clays will resist fusing action longer than fine-grained ones.

It must be remembered, however, that of the substances entering into the composition of clays, lime, magnesia, alumina and silica are practically infusible at the temperatures within the reach of the ceramic industries, if unmixed and pure. But this state of affairs changes very much when we deal with compounds of these substances. Thus, lime, calcium oxide, is practically infusible, but when in combination with silica, forming a silicate of lime, it can be melted without much trouble. Pure alumina and silica, considered only from the standpoint of refractoriness, would form very satisfactory heat-resisting materials if their use was practicable. Alumina, however, stands higher in the scale of refractoriness than silica, and the silicate of alumina is somewhat higher than the pure silica.

But silicate of alumina is pure clay, which is thus the best heat-resisting material known to clayworkers. This has been amply proven by a large number of accurate experiments ser'ous sic'nes', but his'n had been the revivin of a korps. I silicate of alumina, is the most refractory compound and has the following percentage composition:

Silica	46.4 per cent.
Alumina	39.7 per cent.
Water	13.9 per cent.

Such a pure clay is taken as the standard of refractoriness for fire clays, and is known as cone No. 36 in the series of pyroscopes made by Seger. Hence, the nearer a fire clay comes to the above composition the nearer will it come to the standard of maximum practical heat-resisting power. Upon adding silica to this pure clay its refractory quality will be lowered, so that it goes back to, say, Cones 35, 33, 32, down to Cone 26, when, on addition of still more silica, the melting point rises again, and finally, when the silica has replaced all of the alumina, the point of fusion will be that of pure silica, or Cone 35. From this it follows that silica must be considered a detrimental ingredient for highly refractory clays, and a silicious clay can never be regarded as being of high refractory value, notwithstanding all popular beliefs to the contrary.

Now we must understand, however, that this fluxing action of silica takes place at very high temperatures—that is, temperatures which can be considered only in connection with high-grade fire clays. For clays which have a low melting point, compared with fire clays, this influence of silica does not hold true. In the case of such clays silica invariably raises the fusing point. For instance, a brick clay maturing at Cone 2, vitrifying at Cone 4 and melting at Cone 6, would not be made more fusible by the addition of silica, but, on the contrary, would be rendered more refractory. Hence we may safely assume that in the case of all clays which do not belong to the highly refractory class—that is, such used in the manufacture of building materials and pottery—silica raises the points of vitrification and fusion. Alumina, on the other hand, always increases the refractoriness at high as well as at low temperatures.

We are thus justified in saying that the greater the contents of alumina of a clay the greater will be its heat-resisting power, and for all but high-grade fire clays we may say that the melting point rises in proportion with both the alumina and silica contents. But we must never forget that the amount of fluxing material (lime, magnesia, alkalies and iron) always exerts a powerful influence, as well as does the physical character of the clay.

Detroit—A Bit of Lake Front.

A Corner of the Zoo.

Time and time again attempts have been made to calculate definite numerical values for the degree of refractoriness of clays from their chemical composition, and several formulae have been devised for this purpose. But no accurate results have so far been obtained in this way, although it cannot be denied that the formulae proposed by Seger and Wheeler give valuable information in regard to the relative fusibility of clays. The deficiency of these methods is simply due to the fact that no satisfactory factor can be found for bringing in the effect of the physical composition.

After all, the most direct and practical way of determining the standing of a clay in regard to its heat-resisting property is that of actual trial. The clay to be tested in this respect must be heated to a more or less high temperature, and its point of vitrification, as well as that of fusion, determined, either by comparison, as in the case of Seger cones, or by direct measurement by means of a pyrometer. When asked to pass judgment over an unknown clay we must first of all determine whether it is to be considered as a fire clay, to be used as a refractory material, or whether it comes within the great class of clays forming the basis of all other branches of the clay industry. This can best be settled by a chemical analysis, especially if made by the rational method, or by an examination of the burned clay.

A more or less red-burning clay evidently can belong only to the second class. The general appearance of a clay in regard to density and fracture after burning will usually help to decide where the material belongs, and there is little danger of a high grade of fire clay being used in the manufacture of building brick, and the man who does not realize the difference deserves but little sympathy.

If, according to the preliminary tests, the clay is of the refractory type, we must subject it to a high heat in a suitable test furnace in order to obtain correct information in regard to its proper heat resisting value. This is best done by making use of a furnace of the type of the Deville furnace, so much used by Bischof and other investigators in their work of examining fire clays. Its construction is very simple. A cylinder of highly refractory clay, eight inches high and four inches inside diameter, and provided with an iron shell, is placed upon a thick iron plate which has an opening, one and one-quarter inches in diameter, at the center, surrounded by quarter-inch holes arranged in concentric circles. Below the iron plate there is left an inclosed space of about four inches depth, serving as a reservoir of air under pressure. The fire clay cylinder on top is provided with a clay hood, through which the fire gases escape. Into the opening at the center of the iron plate there is fitted a fire-clay block, serving as a support for a crucible one and one-half inches in diameter and two inches high.

The clay to be tested is made up into small pyramids and placed in the crucible, together with Seger cones, say, Nos. 20 and 25. A plate of the very best fire clay is now placed on top of the crucible and heat applied. This is done by starting the fire with burning charcoal and filling up with gas retort graphite. As soon as the fire is under way air is blown in under the iron plate by means of foot bellows, or any other blast, and the heat raised till either the higher or the lower cone has been melted or bent. Upon comparing the test piece with the cones it will be found whether or not the clay corresponds to the one or the other of the cones. If the cones are bent or melted while the trial is still standing, and has sharp edges, the clay evidently is more refractory than Cone 25, and another trial must be made with higher cone numbers. On the other hand, if the clay is more fusible than Cone 20, it cannot be considered a good fire clay. As a rule, four or five tests will suffice to determine the character of the clay in regard to its heat-resisting power.

If desired, the melting or softening point of the clay may be compared with the melting points of wrought iron or platinum by putting pieces of iron or platinum wire into the crucible and heating up to the melting point of one or the other. It has been suggested to fasten a piece of iron wire to the crucible and extend it out of the furnace. At the end of the wire a weight is attached, which, of course, drops when the iron melts, and which may be made to ring a bell. At the high temperatures involved in the testing of fire clays it is not possible to use pyrometers, since platinum nearly always enters into the construction of the apparatus, and, of course, the metal is sure to be melted and the instrument destroyed. As yet no instrument has been devised which answers for use at these high heats.

If, however, the clay in question is not of the refractory class, its fire test comes more within the range of accurate work. For whatever purpose it is intended to be used, for brick or for pottery, its points of vitrification and fusion should be known. This, of course, may be determined on a large scale, if desired, in kilns of working size, or in test furnaces of various styles. The ultimate data which is desired is the same—that is, the difference in temperature between the points of vitrification and fusion. It is not sufficient to know at what point a certain clay vitrifies or melts; we ought to know the interval separating the two stages.

For instance, in the case of a paving-brick clay, it is extremely useful to know how much the temperature may be raised above the point of vitrification without producing viscous vitrification, which means brick crushed out of shape, or at least stuck together. What is desired to be known is the point at which sufficient vitrification has taken place and the margin between this point and the stage of incipient softening. With a clay high in lime these two points are close together, just as they are with a clay containing much iron in the ferrous condition. Clays moderately high in alumina and ferric oxide may be depended upon for slow vitrification, and hence safe burning.

A Detroit Pleasure Resort

Belle Isle Park Casino.

Of course, these points may be determined in various ways. One man may estimate the temperature by eye, another by the shrinkage of the ware, a third by both. From the practical standpoint it does not matter how it is done, so it is done in a satisfactory manner, in a way which permits of the minimum of error. From the scientific standpoint the error is not exactly measured in dollars and cents, but by the standard of absolute accuracy, and, as it happens, this standard is always beneficial to the dollar-and-cent standard. Now, the estimation of temperature by eye must be rejected, from the scientific standpoint, as being governed too much by the personal factor. The shrinkage test likewise cannot be recognized as a means for judging absolute temperatures, but is an excellent guide after the proper temperature and the shrinkage of the ware at that temperature have been determined, and, of course, applies only to a particular clay.

The next method is that of reference to a standard set of pyroscopes, such as metals, alloys or Seger cones. Thus, if the temperature in a kiln is just sufficient to melt a piece of silver, and knowing the melting point of silver to be at 1,000 degrees C., the temperature in the kiln is easily determined. The pyrometric cones are especially adapted for our kilns. If a clay vitrifies at cone No. 4 and melts at cone No. 8, by put-

ting in the kiln some No. 4 cones the required temperature need never be exceeded.

The last and most exact way of measuring temperatures is the use of pyrometers. By means of these instruments the intensity of heat can be expressed in definite, absolute terms, but their strictly practical value is perhaps not greater than that of cones as far as simply the measuring of temperatures is concerned, for the clayworker does not care what temperature prevails in the kiln as long as the proper heat is maintained and the finishing point is reached.

This information is given by the cones in a satisfactory manner. But, after all, the information obtained by means of pyrometers is still of great importance to many branches of the clay industry, for it tells us the rate at which the heat is raised and lowered. A pyrometer tells us whether the heat has been raised steadily, whether the kiln has been allowed to cool down too much on cleaning grates, and, finally, at what rate the cooling is taking place. This information is such that every clayworker will be glad to have it, especially in the manufacture of goods like glazed brick, fine pressed brick, decorated ware, and, last but not least, paving brick.

Delinquent firemen, faulty furnaces and faulty firing may thus be found out and the proper corrections made. Therefore let us not scorn the use of pyrometers in the proper place, to do which there is a strong tendency among some clayworkers.

The most successful pyrometers invented so far are the air and electric pyrometers. The first depends upon the expansion of air on heating; the latter, of which there are two kinds, depends upon the principle of current generation on heating a combination of two metals, like platinum and rhodium, and the principle of increase in resistance in a platinum wire to a certain current of electricity proportional to the heating of the wire.

These several forms are now on the market as quite convenient instruments, but as yet too expensive for general use, the cheapest costing about $120. But there is no doubt that in the near future American ingenuity will succeed in manufacturing simple instruments which can be sold at lower prices and thus be introduced more generally among clayworkers.

AMERICUS.

(To be continued.)

AFTER GATES'S BUTTON-HOLE.

Deer Gaits—I kan't hook my finger into that button-hole, so I'm goin' to jab a pen into it. I will hook onto it at the convenshun all rite, but I want it now, and kan't wate.

I'm goin' there, shure, and I'm goin' with the krowd. The way I figger it out, there's jest es mutch in how you go as in when you go or where you go.

Goin' with the krowd, I get a day or a night more of fun goin' and comin', and it makes just so mutch more convenshun.

Last year I got an idee on kiln furnaces that saved me a bunch of money and a bundle of worries, and I got it from a Western feller on the train. It paid for hull trip.

Then I run across another feller, and we got chummy and told each other our trubbles. Gosh! but he'd had a time of it! I kinder tho't that I was the oneley feller that had had real trubble, but mine wa'n't in it to his'n. Mine had been a pritty ser'ous sic'nes', but his'n had been the revivin of a korps. I seen to wunst where he got his gray hair and wrinkles. He got 'em 'onest. They'r a krown when 'onestly won, and they show a heroe or a raik when they come fore they're doo. He told me how one thing after 'nother had gon' ag'inst him, till it did most seem's tho' he was akurst and set up fer a objekt less'n—fer a kind of horribl' exampl'. He was klean beet, but he never found it out, but jus' kontinuered throwin' clay and doin' bisnis, and finally he jest negleckted findin' it out so late that no one else didn't never find it out, too.

I wuzzent glad fer his mizzery, but it maid me feal a whole lot better to 'no' that I wuzzent the oneley wone.

I had seen a whole lot of you fellers that I konkluded had never had no trubbles, and I sometimes felt soar 'cause I had 'em all. Then when I found I dident have 'em all by a darn site I felt easier, and findin' this feller had konkered his'n made me think I miself cood do the akt. Then when I incidentelly lernt that you fancy prancers had rus'led with your share and konkered 'em, that settled it, fer if you fellers could win out thair shurely was hope for any of us.

Mi yard ain't so blame big, but it's a good yard. Mi clay won't maik krokery, but it does maik good brick. I kan't reed Dutch receeps, but then I'm makin' American bricks, and I'm makin' 'em jest as good as I know how. When they go into a wall they go to stay, and no won will ever say I wuz a froad. Most everybody else's work perishes. The karpenter, the miller, the banker, partickulerly the dockter, and even the staitsman, the awthur and printer, but mine will stand till the last day, and even then clear up to the "fervent heat."

No, Gaits, I'm not ashamed of my kallin', not by no means. It's a proud and honnerble okepashen, and it karries worries enuff to keep your think from gettin' ruste.

Workin' in mi own little world, I do get into rutz—get ruste as it wur—and when convenshun time kums I welkom it as a good time, as a picknick, as a rekreashun, and also as a meens of takin' me out of the rutz and givin' me renude gumpshun, so I can go back full of enthuze and things and make better brick and more of 'em.

Well, tell the Chicago boys I'll be with 'em. Keep a place fer me in the krowd. I don't keer what way you go or what you go in, so long's you bunch, but kount me won of the troop.

ANCIENT EGYPTIAN PORCELAIN.

It has often been a subject of question as to whether a veritable porcelain has ever been made by the Egyptians, the term including products which shall be compact and translucent. The French savant, Brogniart, in his treatise on ceramics, concludes that all the samples of porcelain found in Egypt are of Chinese fabrication. M. Le Chatelier has lately made some interesting researches in this direction, and has presented his results to the Academie des Sciences. Among the samples given him by an archæologist he has found a fragment of a funerary statuette coming from Saggarah, which he pronounces to be undoubtedly of porcelain. Its hieroglyphics leave no doubt as to its fabrication in Egypt. The paste is translucent and of a pale blue color. In composition it presents marked differences from that of china. It is a veritable soft porcelain, its blue color being due to the addition of a small amount of copper. The experimenter has been able to produce a substance which resembles this very closely by making a paste of ground sand, 55 parts; white clay, 5 parts, and a special blue glass, 40 parts. This latter was made up according to the formula—

$$3.3\ SiO_2,\ 0.23\ CaO,\ 0.13\ CuO,\ 0.64\ Na_2O.$$

This paste, when baked at a temperature of 1,050 degrees C., yields a pale blue mass which turns to green when the temperature is raised above 1,200 degrees. It is to be remarked that by reason of the feeble proportion of clay in the composition, the wet paste is plastic only in a feeble degree, and for this reason could not be used for molding objects except those which took a compact form, such as the statuettes referred to. —Scientific American.

WORTH REMEMBERING.

One step won't take you very far,
  You've got to keep on walking;
One word won't tell folks what you are,
  You've got to keep on talking.

One inch won't make you very tall,
  You've got to keep on growing;
One little "ad." won't do at all,
  You've got to keep 'em going.

Written for THE CLAY-WORKER.

BRICK ROADS FOR COUNTRY HIGHWAYS.

—Poor Roads Cost the Farmer Much More Than It Would Cost to Build Good Roads.—

MAY SEEM STRANGE to hear one talk of paving country roads with brick, yet it can be done in many sections as cheap, or nearly so, as any other good road known to the farmer. First, the farmer might ask how much we will be taxed to pay for such a road. Second, I may ask, does any farmer know how much road tax he is paying? No, not within one-half. It is not cents and dollars he pays to the county treasurer, but the repair bill on harness, wagons and general wear and tear on the teams. He pays his taxes to the blacksmith, wagonmaker, harnessmaker, and to the horse dealers. Not only this, but the loss of time by not being able to haul on account of the weather, and the small loads he hauls when the weather is favorable. The best mathematician that ever breathed God's free air could not tell how much the farmer is taxed by having such roads as we see in the country to-day. Not only that, but take into consideration the bicycle riders, pleasure seekers who wish to drive out a few miles for recreation, prospectors visiting a new country, etc., when it is chuck holes, mud holes, sand, mud and the Lord only knows what else. A man better pay more taxes to the county and have solid comfort than live all his life in misery and pay his taxes to the county through the blacksmith, wagonmaker, harnessmaker and the horse dealer and have his liver shaken about sixteen degrees out of place all the time. As I have said before, no farmer can tell, nor has he any idea, how much taxes he pays annually, taking everything in consideration.

How can we improve our county roads? Very easily, especially in some localities, such as eastern Virginia, and many other sections where they can get good paving brick. If they are not in reach of first-class vitrified brick, let them have their home brick plants make the brick. You can find clay in almost all parts of the country that will make a brick which will last twenty years or more, if properly put down and cared for. The common brickmaker could, by being more careful in the manufacture, and especially in the burning, make such brick as I am speaking about. I don't mean to say that this can be done from any clay, but I mean to say that there are lots of brick plants turning out building brick that could turn out such a brick as I refer to by putting forth an effort to do so. This would enable the county to get paving brick at a reasonable price.

Well, what would the county save by such an extravagant deal? Say the road would last thirty years or more, one can readily see what they would save. It would be dollars saved against cents saved now, and solid comfort for those who drive over such roads. The farmer could double his load. What does that mean? It means the saving of one team in hauling, and that would save the increase in taxes before he knew it. The cycler could cover twice the ground in a day; it would increase business in every way, and make any country rich which would take such steps. It would be as great an improvement as the railroads are over the old stage coach.

I drove over a brick street in Mansfield, O., last month which was laid twelve years ago (so I was told there) with common red brick, and if I am not mistaken they were soft mud brick, for I brought a bat home with me to settle any dispute I might have over them. I got it from a street where they were doing some repair work. Well, this street, it is true, is quite rough now, but has stood the test in a busy city like Mansfield for twelve years. Now I am safe in saying that it would last twenty-five years in the country. I could not help admiring the streets in Wellsville, Steubenville, Canton and Mansfield, O., and the towns near Pittsburg, such as Braddock, McKeesport and Wilmerding. All brick streets. What an improvement over stone, asphalt, or anything else ever put down for streets. Then again, take it from a sanitary point of view. It is the most sanitary street known to-day, as it is almost waterproof. It will absorb less water than any other pavement, and, as the brick lay so close together, it does not permit filth and dirt to find a hiding place between them. A great part of the disease in our cities to-day originates from filthy streets. Clean looking streets, perhaps, but saturated with filth of every description. I believe the death rate would be lessened in every locality by the introduction of brick streets and country roads. Of course, brick streets can be neglected and become filthy, yet every pavement known to man needs attention to keep it clean and in repairs, and the brick street requires less attention than any other to keep it in the same condition.

I think the streets in Mansfield are kept about as clean as any I ever saw. At night they fairly glisten under the electric lights. I remember seeing brick streets in another town, which I will not mention, and they had so much dirt and mud on them that I had to scrape it away with my shoe to see what kind of paving material it was. Well, I felt like it was an in-

Country road, Warren county, Illinois, paved with Purington Brick. Cost, Complete, $1.00 per running foot.

sult to the manufacturer of those brick, and I think every brickmaker should raise a kick when they see their brick so badly used, for other cities near by may be contemplating putting down brick streets, and they are just as likely to take a neglected pavement for an example as a well-kept one. I hope the day is not far off when the people of this country, as well as others, will come to realize that brick streets are the best and only kind to put down. We must find a market for our product, and the city streets and country roads are worth looking after.

I also think the paving brick plants could make a curbing to take the place of stone, and very much cheaper and very profitable to the manufacturer. Say they make it about 3x12x24 and stand it long way down, each piece would represent a running foot of curbing, and make a very strong and substantial one. If necessary, they could groove the side to tie it together when put down. I think by working this up it could be made a very profitable addition to the clayworkers. What we want is to introduce everything that there is a profit in, to enable us to keep our plants running at a profit. I believe there are a great many articles unthought of now that could be turned out from clay at a much larger profit than common brick.

H. L. JACOBS.

Written for THE CLAY-WORKER.

CANTON, O., PAVNIG BRICK INDUSTRY.

PERHAPS NO CITY in the United States is so widely known in connection with the paving brick industry as Canton, O., and this is owing to several causes.

First. She was the first in the field. Not that the first paving brick made in the country were produced there, but, as we shall show later, she was first in developing a distinctive paving brick industry.

Second. Her goods took high rank for quality in the outset, and this rank she has ably maintained.

Third. No section of the country is more favorably located for securing a wide distribution of product.

Fourth. She had the clays of the right sort, combined with low cost fuel.

Fifth. And not least in importance, she had the men with the brain and push necessary for pioneering to success a new enterprise. These men were far-sighted enough to see the possibilities wrapped up in the future of this industry, and possessed the needed courage to invest their capital in a new undertaking. And yet we are inclined to think that no one of them has had, until the present year, any adequate conception of the enormous proportions which the industry is sure to attain to. It is probable that only a year ago any manufacturer of pavers would have told you that the paving brick craze had resulted in building plants that would be able to more than supply any demand made upon them in the next five years, and perhaps more.

We are just now near the ending of our first year of the general revival of industry. At any rate, the first year since 1893 in which the accumulated burdens of the five years of depression have been thrown off and the wheels of commerce have been well lubricated for a fresh start, and what is the result as it has affected the paving brick industry?

We have before us a letter dated so far back as August 26 last, written by one who is very prominent as a dealer of the Canton product, which reads: "Our yards at the present time are cleaned. Shipments are being made from kilns as burned. There are quite a number of brick lettings coming up in this vicinity in the next thirty days, and our effort will be to get as many carried over until next spring as possible, as it will be out of the question to furnish any more brick than we already have orders for."

We know that about this same condition of things has existed in other localities, but let us stop right here to say that there is, to our minds, no warrant as yet for building more paving brick factories excepting in localities far distant from present plants, and then only on the best of conditions as to material and fuel, with the advantage of a large, near-by market, now cared for by long shipments, prevailing.

—And Why?

We overheard the management of one paving plant say to his superintendent a few days since: "We have about doubled our product over last year, but we must make another large increase," and how? Speed up our brick machine, improve our drying facilities, add another kiln or two, and this tells the story of what will prevail another year. No time will be lost the present winter, and every concern will strive to make the most of its facilties. We think it quite safe to predict that the plants now existing may be expected to turn out 25 per cent. more of product the coming year than the past. This will be accomplished by running full time, increased speed of machinery in some cases, improved drying facilities—not necessarily extensions, but up-to-date methods—and last, addition to kiln facilities. All this will result in a reduction of avereage costs and add to the margin of profits of those now in the business.

We write understandingly. "Smelling committees" from the plant at A are visiting plants at B and C, in order to decide upon the best programme to adopt. Not a few old kilns will be overhauled and fitted with more modern furnaces. This is already going on, and, to the mind of the writer, there are large margins of difference between the fair and the best in all the lines named.

—A History—

Of the Canton paving brick industry will be of interest preliminary to describing what may be seen in the plants located there to-day.

In 1887 Captain Wm. S. Williams and Nicholas Merley both commenced the erection of plants with special reference to the manufacture of paving brick. Up to that date the only paving brick known in that region of country were made by John Porter, whose works were located upon the Ohio river, near New Cumberland, W. Va., who was making pavers from fire clays. From all we can learn, Mr. Porter's plant was not built for paving brick purposes, but was experimentally making some, and these were being tested at various points. Among these points was Cleveland, O., where a small strip of paving was laid between the tracks of a horse car line. These caught the eye of Captain Williams, who, as a civil engineer in the office of Col. John M. Wilson (now General Wilson, chief of

East 10th Street, Canton, O.

engineers in U. S. army), was doing duty at Cleveland. Captain Wilson was led to watch the pavement closely, and his interest led him to inspect other small pieces laid with the same make of brick in several Ohio river towns. And these investigations led to the building of a plant at Canton, which was completed, with two kilns, in the spring of 1887. In the construction of this plant no other product was had in view but street pavers, and we judge Captain Williams thus became the ranking paving brick manufacturer in this country purely as such.

The first brick made by Mr. Williams were laid on Cherry street, Canton, in the summer of 1887, and also on South Court street, and were from fire clay.

In the spring or summer of the same year Nicholas Merley, an old brickmaker of Canton and vicinity, having erected a plant for the manufacture of hollow blocks, from the vein of shale known as No. 4 (geologically speaking), was induced to try his hand at pavers also, and the brick made by him from shale proved an unqualified success. He secured a contract for paving North Court street, Canton, the same year. These brick were all of standard size, 2½x4x8½ inches, and were wire cut. Mr. Merley has thus the honor of being the first shale paving brick manufacturer in this country, and probably in any country. His plant was also a small one, like Mr. Williams's, being equipped with but two kilns. It may be said of these fire brick laid by Mr. Merley that they have now seen about twelve years

of service, and are in excellent condition for another twelve years at least, and they have been subject to good wear.

Captain Williams was at once converted to shale as furnishing the best material for the purpose, and has been an enthusiastic advocate ever since. In 1888 he was turning out brick from vein No. 3, which, to use his own language, he found to make a paver "so much harder, stronger, and evidently more durable, and in every way superior to fire clay brick, that thereafter shale was alone used." The entire output of this factory in 1888 was shipped to Mr. L. M. Southern, of Cleveland, and were used in that city. We have not discovered whether on public streets or not, as the earliest records we have been able to obtain of shale brick in Cleveland from the engineer's office dates 1891. But it will be remembered that a two-kiln plant

North Cleveland Avenue, Canton, 1897.

would not make a very large mark in a single season. It is worth noting here that the first fire clay brick laid by Captain Williams on South Cherry street, Canton, wore out and had to be replaced within four or five years, while that on Court street was also replaced years ago. This statement may and should not be considered as a blanket indictment of fire clay pavers, but it certainly applies to those made at Canton.

On the other hand, in our Cleveland paving brick pavers, we refer to fire brick pavers in use ten years in excellent condition. Let it be remembered that we are now discussing the Canton paving brick industry. Captain Williams has said, referring to this early period: "It seemed very hard for a long period to convince the general public that brick of any kind would be durable and a proper material for street paving."

All honor to these early pioneers, Williams and Merley, who laid the foundation of what has become a most important feature of clayworking, not forgetting John Porter and others who did early pioneer work. From these early beginnings there has since in Canton and vicinity grown up a business which has demanded the investment of near a half million of capital.

In the fall of 1888 H. S. Belden and J. L. Higley purchased the Merley plant, and, being men of energy and push, immediately commenced to enlarge and increase the capacity of their plant, which was thereafter known as the Canton Brick Co., and has, for the years intervening, been a prominent factor in the paving brick interests of this section, their brick having been shipped hundreds of miles, both east and west, and standing second to none in quality. The first large contract of this company was for about a million standard wire cut brick in 1889, which were used in paving East Tuscarawas street, Canton, and the price received was $10 per thousand. These brick were laid on a gravel foundation, and the street, notwithstanding the comparatively poor methods used in laying, and the relaying and removal to other parts of the street of car tracks, is in good condition to-day, though over it has been passing the heaviest traffic of the city, as we judge.

This yard price of $10 per thousand was maintained until 1893, with an addition of $1 per thousand for repressed stock. The demand during these years was such that, while the annual capacity of the factory was increased to about twelve million, they were taxed to their utmost to fill orders.

In 1897 the Canton Vitrified Pressed Brick Co. was consolidated with the Canton Brick Co., the new organization being incorporated as the Canton and Cleveland Brick Co., with a capital stock of $200,000. The Cleveland factory, located a few miles south of that city, has been enlarged, and the annual output of both factories is now about twenty-five milions of brick, for which, in 1888 and 1889, there has been a greater demand than could be met. The officers of the company are B. F. Marry, president; Geo. J. Hoffman, vice president; J. L. Higley, secretary and treasurer; Peter Miller, superintendent.

—The Royal Brick Co.—

Was incorporated in 1890, with a capital stock of $50,000, Otto Geissen being the moving spirit, a small number of brick being marketed the first year. This plant was built with all modern improvements—stiff mud brick machine, repress, steam dryer and Eudaly kiln. Mr. Geissen was a practical and energetic business man, and the product of his company was soon well and favorably known. The factory was burned down in 1895, and at once rebuilt. The new plant, being built of brick and iron, is made what may be termed a fireproof structure. In 1897 Mr. Geissen died. Since his death his son, Otto, Jr., has taken his place. Notwithstanding the company's misfortunes, it has prospered, and the plant is to-day one of the finest and best equipped in the country, having an annual capacity of more than twelve million of brick. The present officers are J. W. Walsee, president; Louis Moushey, vice president; Otto Geissen, secretary and treasurer; Jacob Renkert, superin-

South Market Street, Canton, 1891.

tendent. We present a couple of photos of these works, and we dislike to leave them without referring to the courtesies extended to us by the office, and without referring to what was of great interest to us—the method of drying green brick in the use of the waste heat of the kilns. This plan was devised by Mr. Geiseen, Sr., and has, therefore, been in operation some years.

There are eight or nine Eudaly kilns in a row, just sufficiently far apart for convenience in firing. Between these kilns midway a tunnel has been laid connecting with a main tunnel as a header, which conveys the waste heat of the kilns, which begins to be taken off just as soon as firing ceases, and which is drawn by a fan (84 inches in diameter, we think), stationed at one side of the steam (?) dryers at the end nearest the kilns. The heated air can be tempered by the admission of outside air at the fan, and as used it is thrown into a pit with open top, crossing the end of the drying tunnels at a tempera-

ture ranging from 400 to 500 degrees Fahrenheit. The heated air traverses the length of the tunnels and is discharged in similar open pits or flues at the rear end of the tunnels, which flue connects with a low stack.

Of this system, it may be said it is the only and efficient means of drying the entire product of the company. Experience has shown that in its use the time of firing the kilns has been reduced twelve or fourteen hours on each kiln, as against former experience. The suction of the fan drawing the heat from the top to the bottom of the kiln completes the burn, which would otherwise need to be prolonged. This system is well worthy the attention of clayworkers generally.

—The Imperial Shale Brick Co.—

Of whose works a photograph is given, and the clay pit also, is located in the side of the same range of hills, perhaps a half mile west. This company was organized in 1891, with a capital

3 Imperial Shale Brick Co's Clay Beds. 4 Rear View of Works.

of $100,000, and in 1892 it commenced turning out paving brick.

Captain E. D. Keplinger, the general manager of the company, undertook this enterprise, with a view to having the best equipped brick plant in the country, and further, to make the best paving brick made anywhere, and I may say, in strict confidence, that a competitor of the Captain's informed me that he has succeeded in both undertakings. The location of the factory is perfect, situated on a sloping hillside, with an immense bed of shale in the rear of the factory, so that, from the mining of the clay to the loading of the brick from the kiln to the cars, there is a gentle descent, insuring the greatest ease in handling both material and product.

Nothing but the best and latest machinery is used in this factory and the entire plant is a model one in every respect. Nowhere have we seen brick works in such fine trim, such perfect order, as here, save it be at Los Angeles, where one can find several plants answering the same description and of which we hope some time to present a picture. But then we understand that Captain Keplinger developed his rules of order in a dry goods store, and has transplanted it without diminution to his present field. With a brick machine that will turn out easily 75,000 brick a day, a steam tunnel dryer holding holding 150,000, and eight Eudaly kilns 22x84 feet, this factory turns out about fifteen million brick annually, and it is safe, we think, to say that their standard make of brick, branded "Metropolitan," is regarded as second to none in uniformity and in durability, and the same competitor whom I formerly quoted whispers in my ear, you may put it "the most uniform and durable."

The present officers of the company are C. W. Keplinger, president and treasurer; Josiah Correll, vice president; E. D. Keplinger, secretary and general manager.

It will not do to dismiss Canton pavers without mentioning and commenting upon a fact which we hope may contain a hint for other brick manufacturers, and which presents a strong evidence of the "level-headedness" of the group of men whose works have been under discussion. After for years running a tilt with each other, four years ago these several companies decided to put the sale of their united product into the hands of Mr. J. L. Higley & Co., who make all sales on a commission basis. The results are, first, increased ability to fill orders promptly, especially large orders; second, reduced expense in the cost of marketing brick, and, third, less competition. One of the managers said to me, "This move was our salvation."

This company is composed of J. L. Higley, W. E. Keplinger, H. S. Renkert and C. W. Keplinger. It will be observed that each of the three companies is represented in this firm. Their management of the business has proven so satisfactory to the several companies that there is no desire on the part of either to attempt to handle their own product. In 1898 the entire output of the companies was disposed of by Sept. 1, and this year their salesmen were called in by Aug. 1.

In the early days, perhaps not over $10,000 was invested by either Captain Williams or Mr. Merley, and the output was correspondingly small.

No doubt the early success scored by the Higley Co. (Canton Brick Co.), from 1888 to 1890, induced the starting of the other plants.

The Captain Williams plant, after being idle since 1893, has just been started up. It is not as modern as the other plants mentioned. We trust it may score a success.

The size of standard Canton brick burned is 2½x4x8½ inches, weighing 7 pounds, 3½ tons per thousand. Size of regular block, 3½x4x8½ inches, weighing 10 pounds, 5 tons per thousand. The character of the shale clays about Canton is practically the same. It is, generally speaking, mined without stripping, and the supply is practically inexhaustible.

We desire to acknowledge our indebtedness to Mr. J. L. Higley, Captain Williams, Mr. Geissen and Captain Keplinger for courtesies heartily extended. In wanderings over this planet in search of information, my desire will be met if I am permitted to meet others like them. E. G. DURANT.

WILL MEET THEM AT DETROIT.

Publisher CLAY-WORKER:

Inclosed please find check for my subscription to The Clay-Worker for 1900, also my annual dues to the N. B. M. A., which you will please see go in the right channel. The Clay-Worker for 1899 has been a No. 1 journal, and really any brickmaker who does not take The Clay-Worker does not, in my opinion, know where he is at. Individually, I should not want to think of running a brickyard without it. The brick business in the East this year has been all right, and a man in the business the past year who has not made money had better get out, as there is nothing in it for him. Have been driven all summer, and it has been the best season that I have ever had. Now, about coming to Detroit in February, I cannot tell you as yet, for I have several trips in contemplation, but which one will materialize I do not know yet. Want to come "awfully," because I want to shake hands with my friends and fellow-clayworkers.

Glens Falls, New York. DANIEL P. DE LONG.

Written for THE CLAY-WORKER.

SOME COSTLY BITS OF EXPERIENCE.

BY L. C. MOORE.

THERE ARE perhaps very few men who have not had several attacks of the above malady, and I am sure no brickmaker enjoys an immunity from its ravages. Unlike lightning, it often strikes more than once in the same place, and the oftener it strikes the harder it hits. However, there is one consolation in all of our tribulations: we get somewhat accustomed to them, so that the pain they inflict is not so acute in our later as in our earlier experiences. These callous spots in our sensibilities often become prominent features in our moral make-up, and, whether for weal or woe, a certain amount of stoicism is essential to a successful career in clayworking. If we make a mistake, try again, but carefully avoid the old pitfalls.

But I started out to tell some costly bits of experience that have befallen me. We have added the business of drain tile to our original factory, and, though meeting with some discouragement at the outset, we have succeeded beyond our expectations. We built a down-draft kiln especially for burning the tiles, because we had not succeeded to our entire satisfaction with the up-draft. We made and burned several kilns of four-inch tile in our up-draft kilns, but, having a demand for larger ones, we made several thousand sixes and eights. When we came to set them in our down-draft kiln we thought the proper method was to put the sixes inside of the eights, and the fours inside of the sixes. This would economize the space, and the extra cost for fuel for burning in this way would not be commensurate with the advantage gained by this saving of space. This seemed to be all right. The smaller ones went into the larger ones, and left some space to spare. There surely could be no trouble arise from such an arrangement.

But when the kiln was burned and cooled, and we came to withdraw the ware, we found the large tiles badly broken, while the fours were as perfect as tiles could be made. More than one-half of the sixes and eights were split down one side, and 25 per cent. were broken laterally into halves. The large tiles were almost a complete loss, and all because we had "nested" them too closely. Whenever an eight-inch tile had only a four-inch tile in it it was all right. But whenever a six-inch tile was found in an eight-inch or a four-inch tile in a six-inch, the larger tiles were split as described above. But one experience of this kind was enough. So we now put fours inside of eights and threes inside of sixes, and have no trouble.

I do not know that all clays behave in a similar manner, but I have tried a few tiles in several kilns since the first trouble, and the result is always the same, so that I know that no other cause can be assigned for the loss.

We set our green tiles to dry in shelves in large sheds, and depend upon the air to do the work for us. This is sometimes a slow process, and sometimes a rapid one; sometimes a safe plan, and sometimes otherwise. All depends upon the whims of a northern Missouri climate. During the spring months and early summer the drying was slow, but very satisfactory when the quality of the ware was considered. All the tiles were sound and strong, without a check or crack. But as the weather became hotter and dryer greater precaution became necessary to exclude the surplus breezes, thus preventing checks and cracks. Sometimes, when a tile was placed near some opening in the shed, thus exposing it to too much draft, it would be found split open as smoothly as if done with a knife. This ought to have been sufficient warning for us to be extra careful in case of high winds. But the most wary are sometimes caught napping, and that was what happened to us during the month of October, when we were visited by a strong, dry wind, almost the counterpart of a Kansas zephyr. We noticed that freshly made tiles were beginning to crack. We closed the doors of the sheds and thought that would be sufficient. But that wind found many open places through which to enter, and, taking advantage of us while our backs were turned, proceeded to rip things up the back. When we came to put those tiles in the kiln we found no less than four thousand tiles completely ruined. This loss was especially aggravating from the fact that one had free access to all parts of our sheds, and should have discovered what was in progress long before the loss reached such proportions.

Royal Brick Co's Kilns as seen from Office.

Royal Brick Co's Works as seen from Office.

When a burn is in progress one can never tell for certain what is going on in the kiln, and not until the kiln is cool can the burner say what may be the result of any experiment he may be making. But all this happened in broad daylight, and escaped our notice because we thought things were safely protected, and failed to look carefully after our business.

As we have in former papers stated that our method of watersmoking was to begin very slowly, and gradually increase the fires as we thought the bricks or tiles would bear, we would not have mentioned that matter here if it were not for the fact that we concluded to experiment along that line just a little bit and see if we could not gain time and save fuel by more rapid firing. It is human nature to lay the blame for any mistake upon some one else. So I shall follow the example of Father Adam, and say that the error was made by the senior member of our firm, who insisted that we should risk one experiment of rapid firing from start to finish. As he was

the older man—we always called him boss—we reluctantly consented to try his plan. The tiles were very well dried in the sheds before setting them in the kiln, and we had a faint hope that this fact might save them from total ruin. But as nothing else would satisfy the boss, the fires were kindled, good dry wood was crowded into the furnaces, and a cloud of vapor soon began to pour from the stacks of our Eudaly kiln. The fog settled among the neighboring hills and hollows, causing such a murky appearance in the atmosphere that the old burner said that Indian summer was setting in. The kiln had been fired but a few hours when the upper peep holes showed that the tiles were getting to a good red heat, but the vapors were still coming from the flues in clouds. Within twenty-four hours the tiles at the middle peep holes were at a red heat and the top tiles as hot as our clay would bear. Yet still the stacks were fogging. It took twenty-four hours longer to get the bottom tiles to the required heat. It seemed that the vapors were collected in the bottom tiles, and that the last of the moisture was very hard to dislodge. But the burn was finished in forty-eight hours, which was less time than we usually spent in watersmoking alone. Our readers will guess a disastrous result of this burn long before I have time to tell the rest of the story. We found the tiles better than I had expected. I lost several nights' sleep in my impatience to know the result. The tiles were whole and of a good red color, but inside and out they were as full of fine checks as could be. They did not appear to be weakened to any great degree, but were so unsightly that customers avoided them, and we still have them on hands. The boss still insists that those tiles are all right, but he cannot sell them, and he will never insist upon another experiment of this kind.

(To be continued.)

Written for The Clay-Worker.

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 6.

BY ALFRED CROSSLEY.

PHYSICALLY SPEAKING, fire clays proper, in America, are divided into two leading classes, viz., nonplastic clays (often called flint clays, from their flint-like fracture) and plastic clays. I think I am probably correct in saying that the cretaceous and tertiary formations of fire clay are always of a plastic character. The coal measures produce both plastic and nonplastic, and they are frequently associated together in the same veins. The nonplastic is by far the most refractory (other things being equal), but it is doubtful if any one can give a completely satisfactory explanation of the reason. The only explanation I know of is, as expressed in a work published by Henry Carey Baird & Co.: "Tenacity of texture in a fire-brick material is a mechanical condition which, *coeteris paribus*, assists vitrification, a coarse, open body being much more refractory than a close, homogeneous brick of similar composition." It will be understood that the latter condition attends the use of plastic clay, while the hard, nonplastic clay works into an open-grained body. There are probably other reasons for the superiority of the nonplastic over the plastic clays, if we did but know them. I have asked some of the best practical authorities in the United States what is the cause of some clays being nonplastic and others plastic, and why the one variety is so much more refractory than the other, but never could obtain what I could accept as a satisfactory explanation. The fact remains that two clays of the same chemical composition, one nonplastic and the other plastic, will be very different in their ultimate refractory qualities. So far as I have seen and heard, the first fire clays in England and Scotland do not properly belong to either of these classes, but appear to have a character somewhat between the two. I have seen a few clays in America of a similar nature.

For the information of those not familiar with nonplastic clays, a description of some peculiarities of difference may not be out of place. The hardness of clay when first taken from the mine is no evidence in itself of its being nonplastic, many plastic clays being almost as hard as rock when freshly mined. A nonplastic clay presents a clean, sharp, though irregular, fracture. So sharp are the points and edges of the fractures as to often cut the hands with an almost razor-like keenness. When exposed to the sun and rain it soon disintegrates, and will continue doing so until it is comparatively fine, but each time, as it breaks up, it presents the same sharp-edged, clear fracture, and, however fine it becomes, will never soften or soil the hands or clothes, even when rubbed. Plastic fire clay, although it may appear as hard as the other when first mined, not only breaks up under the influence of the rain and sun, but also softens, so that when trodden with the feet in wet weather it will form a sticky, clayey mass.

There is a great deal of ignorance on the subject of plasticity itself. It has been claimed, on the one hand, that the plasticity is in proportion to the *purity* of the clay, and, on the other hand, that it is due to the *impurities* existing in it. It has also been claimed that it depended on the fineness of the particles. None of these explanations, however, are entirely satisfactory, all of them breaking down, sooner or later, before some stubborn fact of an opposite nature. The fact is, this physical condition of plasticity exists in both pure and impure clays; indeed, as regards fire clay, the nonplastic clays are usually the purest, and in fire clays also the grain of the hardest nonplastic clay is very much finer than in the plastic. It has also been suggested that the presence of a large proportion of free silica in the clay reduces its plasticity, but this, again, is not necessarily true, as free silica may exist in such an extremely fine state of subdivision as to escape all but the most delicate tests, and, in this condition, is quite plastic. The weathering of fire clay also influences its refractoriness, but this belongs properly to manufacturing, and will be considered in connection with it. Another matter said to affect the refractoriness of clays, and which is acknowledged by good authorities to be imperfectly understood, is the molecular condition of the particles of clay.

From some things that have been said it might be inferred that a chemical analysis of clay was of little or no use. Such an impression is not intended to be conveyed. While analysis is not an absolute and infallible guide, yet it is a guide, and a very good one, for it gives a clear indication of the quality of the clay, which is generally borne out by a practical test, and in many cases where a clay proves unsatisfactory it is probable that a chemical analysis would show the fault, and often lead to its correction.

Having now, at some length, engaged the reader's attention on fire clays in their different varieties and properties, as the foundation of all good fire brick, it will now be in order to take up the methods or processes used in the manufacture of the same. In doing so I will, at this stage, confine my attention to fire brick of the regular class, as used for blast furnaces, rolling mills, etc. Afterwards I will try to give some description of special varieties of fire brick. A fire brick may, in the abstract, be defined as any brick that is capable of enduring an exposure to intense heat, no matter of what material it is made. Common usage, however, practically confines the term to a brick made from clay. The qualities required in fire brick, according to Dr. Percy, are as follows: "They should not melt or soften in a sensible degree by exposure to intense heat, long and uninterruptedly continued. They should resist sudden and great extremes of temperature. They should support considerable pressure at high temperatures without crumbling. They may be required to withstand, as far as practicable, the corrosive action of slags, rich in protoxide of iron or other metallic oxides."

Greenwood gives the following somewhat more complete description:

"Fire brick should withstand, first, continued exposure to the highest temperatures of a furnace without decomposition, cracking, fusing or sensibly softening; second, they should bear considerable pressure while heated without suffering fracture or distortion; third, they should be unaffected by considerable and sometimes sudden changes of temperature; fourth, for certain applications they require to be unaffected by contact at a white heat with such metallic oxides as those of iron and magnesia, or other basic slags or scoriae; fifth, contact with heated fuel should be without effect upon them; sixth, they should be able to resist at one time an oxidizing and at another a reducing action; seventh, for commercial considerations, fire brick are required to be regular in shape and uniform in quality." And I think Professor Greenwood does well when he adds: "Brick having all these qualities are rarely to be met with."

While this is confessedly true, the aim of the manufacturer should be to make the very best brick possible out of the material he has at hand, and the above clearly defined points of merit should be a kind of code of excellence that we should keep constantly before our minds. Of course, as already said, the foundation of a good brick lies in the clay, for it is a difficult matter to make a high-class fire brick out of clay that has the elements of weakness in its very composition. But much may be done, even with an inferior clay, by careful and intelligent manufacturing, and, if we are fortunate in possessing a good fire clay, that should be no excuse for loose and careless methods, resulting in the production of an indifferent quality of brick, but rather should be an incitement to produce the highest grade of brick possible.

(To Be Continued.)

CONVENTION OF STOVE-LINING MANUFACTURERS.

THE ANNUAL CONVENTION of the National Stove-lining Manufacturers' Association was held at the Broadway Central Hotel, New York, Dec. 12 and 13. The following companies were represented: Presbrey Stove-lining Company, Taunton, Mass., by B. C. Peirce, treasurer; Williams Stove-lining Company, Taunton, Mass., by John G. Williams, treasurer; Taunton Stove-lining Company, Taunton, Mass., by J. W. Parker; Union Stove-lining Company, Taunton, Mass., by G. Arthur Lincoln, treasurer; French & Winslow, Taunton, Mass., by J. Fred Burt, manager; Dighton Stove-lining Company, Dighton, Mass., by G. C. Francis, treasurer; Brooklyn Fire-brick Works, borough of Brooklyn, New York city, by H. A. Perkins, secretary; Brooklyn Stove-lining Company, borough of Brooklyn, New York city, by A. E. Hauser; Peekskill Fire-brick Works, Peekskill, N. Y., by S. D. Horton; Hall & Sons, Buffalo, N. Y., by C. M. Helmer, manager; E. S. Fox & Co., Reading, Pa., by Benj. T. Fox; Rogers & Co., Royersford, Pa., by W. L. Latshaw; McLeod & Henry Company, Troy, N. Y., by Harvey S. McLeod; Greenhill Fire-brick Company, North East, Md., by W. J. Falls; Cecil Fire-brick Company, North East, Md., by W. L. Coudon.

The Convention was called to order by the retiring president, C. M. Helmer, and, after the minutes of the previous meeting were read and approved, the Convention proceeded to the election of officers for the ensuing years, and the following gentlemen were unanimously elected:

President—H. A. Perkins, 88 Van Dyke street, Brooklyn, N. Y.

Vice President—W. L. Latshaw, Royersford, Pa.

Secretary—B. C. Peirce, 212 Somerset avenue, Taunton, Mass.

Treasurer—John G. Williams, Taunton, Mass.

The retiring offices were given a vote of thanks, and the treasurer and secretary were re-elected—the treasurer because, like our friend Sibley, of the National Brick Manufacturers' Association, he always has a surplus, and the secretary for his clean-cut, business way of conducting his office.

Death having taken from us during the past year two of our members, a committee was appointed to take suitable action, and upon their report the following was adopted:

"Whereas; this Association having sustained, by death, the loss of Seth C. French and Horace H. Henry, since our last annual meeting, we desire to give expression to our sincere sorrow and to extend our warmest sympathy to the bereaved families.

"Resolved, That these resolutions be spread upon our minutes and copies thereof be sent to the families of the deceased."

Tuesday afternoon a dinner was given by the Association in

Secretary B. C. PEIRCE, Taunton, Mass.

the private banquet hall of the hotel, and in the evening a small theater party was given to see "Way Down East" at the Academy of Music.

Wednesday afternoon, after all matters pertaining to the good of the Association had been settled, the meeting adjourned. All claim to have had a good business year.

C. A. BLOOMFIELD.

EXPECTS THE GLAD HAND AT DETROIT.

Publisher CLAY-WORKER:

We inclose herewith our check for $2. to pay for another year's subscription for The Clay-Worker, and are glad when it comes to our office each month.

The past season has been a good one for us in the paving and building-brick line. The demand for more brick the past season increased our business considerably, and, while the books have always balanced on the right side each year, the footings this year are far in excess of any previous season; hence we can smile and never grow weary of the brick business. I expect to attend the Convention at Detroit, and, if I do, I trust I may meet all my old N. B. M. A. acquaintances and be able to make many more.

Hornellsville, N. Y. O. PRESTON, Secretary.

THE ILLINOIS CLAYWORKERS ASSOCIATION'S ANNUAL CONVENTION

A SUCCESSFUL CONVENTION.

THE TWENTY-SECOND Annual Convention of the Illinois Clayworkers' Association fully met all expectations. The Clay-Worker's prophecy that the meeting would be the largest of any for a number of years came true, as the readers may verify by turning to the full list of members on the succeeding page.

It will be found to contain nearly all the faithfuls who in past years have made these annual gatherings a source of pleasure and profit to all who have participated, and also a very generous sprinkling of new names—representative craftsmen who are valuable additions to the Association.

The Convention was a fine looking body, young in appearance. Perhaps this was due, in a measure, to the atmosphere of good feeling which prevailed to an unusual extent. Prosperity has brought an air of sprightliness to the older members, who once more think and talk more of the operative features of the business and less of poor prices and demoralizing competition. The croaker was conspicuous by his absence. The old and young alike seemed to view the world complacently.

The meetings were held in the Knights of Pythias Hall, which afforded spacious and comfortable quarters. The anteroom furnished excellent facilities for the display of trade literature, models of machines, kilns, etc., which the festive "middle man" was quick to appreciate.

The Ottawa clayworkers were omnipresent, and left nothing undone that could add to the pleasure of the visitors. Much of the success of the Convention was due to their untiring efforts.

THE FIRST SESSION.

Tuesday, Jan. 9, 10 a. m.

President Townsend: Gentlemen—It is time to call this Convention to order. We have information that a great many more of our members are coming in on later trains. As most of the gentlemen here have enrolled their names, we will omit the enrollment and take up the regular order of business.

LETTERS FROM ABSENT MEMBERS.

Secretary Stoll: We have one or two matters that we might as well consider now. I have a letter here from our treasurer, Wm. Stare, which I will read.

Ponce, Porto Rico, Dec. 18, 1899.

To the members of the Illinois Clayworkers' Association:

I am very sorry that I cannot meet with you all at Ottawa, Ill., this year, as I am here in Porto Rico, but I have sent you my dollar just the same, for I expect to meet with you all again some day, as I have only missed one year in sixteen with you, and have had a very pleasant time at each meeting. I thank you one and all for the favors you have bestowed upon me in making me treasurer for four of five years, and I trust I gave satisfaction. I hope you may have a good convention.

I have a favor to ask of the members, which the secretary will explain. I ask you one and all to sign this petition, if

President H. F. Townsend.

you think I am worthy and entitled to such an office.

Yours respectfully,
Wm. Stare,
Boss Carpenter in the Quartermaster Department.

Secretary Stoll: I have a letter from Mr. Hammerschmidt, saying that, owing to sickness in his family, he will be unable to be with us. He sends his membership, and asks to be remembered to you all. Mr. D. E. Kretsinger also writes that he has been left alone to attend to his store, and so cannot get away. He also sends his membership fee, and wants to be remembered. This brings us to the reports of members on the year's business. The first on our list is our worthy president.

REPORTS OF MEMBERS.

President Townsend: I have no tabulated figures, or anything of that kind. I can only say that we are well pleased with our work and could not ask for anything better, so far as demand is concerned. Prices might be a little better. It has been suggested, in connection with these reports, that each member give the prices that maintain in his locality for common labor. We have been paying 11 cents an hour for common labor.

F. Plumb, Streator: Business with us has improved. We did not get in a full year, having started late. We run, perhaps, two-thirds of the entire year, and a trial balance shows the figures on the right side of the ledger. They have been on the wrong side for several years. We are paying our common laborers 14 and 15 cents an hour. We look for a good season the coming year.

D. O. Loy, Atkinson: I have no business report to make. I have a small claim on a small spot of earth, and I am grubbing along for all it is worth. That is all I have to say about my claywork, but I have something else I might bring in here. I have another interest at stake. For many years I have been honored by being named the Poet Laureate of this Association, and, while I am not on the programme, I may not be here at all the sessions, and I thought it might be pleasing to some of you to hear a little reminder of a year ago, and, with your consent, I will give it.

MADDIGAN'S MARCH.

In the city of Peoria,
And just the other day—
It was at our yearly meeting
For the workers of the clay.
Bright and early in the morning,
According to the plan,
They sent us out to see the sights
With Johnny Maddigan.

Now, happy Johnny Maddigan,
He is a jolly boy;
There is no other like him
In the State of Illinois.
He is only one and fifty,
But he measures six feet tall;
There's many witty Irish lads,
Yet Johnny beats them all.

He took us on a trolley line
To see a large distill.
Much like an army officer,
He marched us down the hill.
March two by two, "that's double fill."
Then Johnny, he cries, "Halt!
Boys, stand contented where you are,
Sure, can't you smell the malt?"

"Forward, march, right face," he said.

"Now climb the stairs," said he.
"All of you boys who like the stuff
Climb up and take your tea."
Much quicker than it can be told
We mounted to the top,
And from their mugs we drank the drugs
Like cattle drinking slop.

He took us all about the place;
'Twas up the hill and down,
While Captain Maddigan points out
The places of renown.
We did not go to see them make
Those grand Peoria brick;
"The yards are all so fine," said John,
"Bedad, 'twould make you sick."

"But look," said he, "the way I point,
Our race course is in sight,
The amphitheater," said John,
"Is the large building to the right.
Just follow me," said Maddigan,
"Sure everybody knows
We haven't got the time to-day
To see them make glucose."

"But see our grand buildings,
As large as Noah's ark;
Bedad, we cannot take them in
And see Bicycle Park.
You must not think you'll see the earth
In one short half a day;
We must get back by one o'clock
To see the fire display."

Sure the way you know he's Irish.
In his eye you see the rogue,
And when he speaks his tongue betrays
The good old Irish brogue.
He marched us on the brick paved streets;
It was this to us he said,
"Now, boys, be sure and keep the step,
Walk straight, hold up your head."

Time was too short to see it all,
Nor can it all be told
While marching on the brick paved streets
With captain true and bold.
I cannot speak for other boys,
But I long to go again,
And ride and march along the streets
With Johnny Maddigan.

Secretary Stoll: I suppose you all know that the secretary of this Association is also a representative of the American Clayworking Machinery Co., of Bucyrus, O. This company manufactures a full line of all kinds of clayworking machinery, everything known to the clayworker's art, and if any of you haven't one of our little memoranda books, I will be pleased to give you one, and that will show you what they manufacture.

N. E. Potter, Kewanee: In our line, the trade has been very satisfactory. We have done a very fair business. We pay 16½ cents for common labor.

W. H. Lyle, Kewanee: Gentlemen, I am very glad to meet you. This is my first offense, though I have been in the buisness fifteen years. I am well pleased to see so many members present. Our work this summer has been pretty fair. We are bothered somewhat in our little town with labor troubles, and I do not know when we will ever get rid of them. At the present time we pay 16½ cents per hour for common labor.

J. M. Powell, Orestes, Ind.: I can say we have had a very satisfactory business in our line, and expect something better for 1900. We paid 14 to 16 cents an hour for common labor last year, and expect to pay the same this year.

Lincoln Solfisburg, Aurora, Ill.: We have had a good business. We sold 2,500,000 brick—all we could make. We pay 15 cents an hour for our common labor.

Mamer Bros., Campus: We have had the best year we have had since we have been in the business, and have made more stuff. We turned out about half a million brick, and have sold at least four-fifths of them. We pay 15 cents an hour for common labor. We came near having to pay more than that this year. I do not remember the amount of tile, but we make all sizes.

H. Lambert, St. Mary: Business has been very good this year. We made more brick and tile than ever, and have sold nearly all of them. We pay 12½ to 15 cents an hour for our common labor.

C. O. Swift, Waverly: We have had a very good year. We have made nothing

President-Elect E. J. Hess, Ottawa.

except drain tile, all sizes. We have a small stock on hand at present. Prospects are bright for next year. We pay our common laborers 12½ cents an hour.

A. M. Combs, Mechanicsville: Business has been very good the last year, and the outlook is good for next year. We have been paying 12½ cents an hour last season and expect to pay the same next season.

A. S. Curry, Reddick: This is the first time I have attended a convention. Business has been good with us this year. I had to rebuild our kilns and put in new machinery, which kept our output back. Our stock has all been sold. We still have some on the yard that has not been delivered, but it is all sold. We pay $1.40 a day, and we have plenty of offers for help next year at the same price.

W. R. Cunningham, Frankfort, Ind.: Way back in the nineteenth century, when some of the old wheel horse traveling men were on the road, I happened to be one of them. Those were the palmy days to sell brick machinery, and when any of the traveling men met another, he would always tell them that he had sold a machine in every town he had been in during the past month. It would make the man who had been up against the real thing for months and had not sold anything feel like the little boy whose mother kept him in the house and would only let him look through the windows at the other boys playing outdoors. As for business, I have quite a large bunch of orders here (holding up a large bunch of papers), but for the benefit of my brethren I will tell them that they are all blank, but I would be glad to fill them out. So far as the brick machinery business is concerned, it has been very good the past season. During the first half of the year prices were not very good, but the volume of business has been twice that of last year. We have quite a number of orders booked. We have made figures on more plants the last sixty days than for several years, which is a good indication of future business, so far as the brick business is concerned. The plant I am interested in made 3,000,000 brick last year, and sold all of them, and we could have sold a couple of million more if we had had them. Our prices are good. We get $5.50 for our soft grade, $6.50 for arch brick, and $7.50 for face brick. We pay our laborers by the thousand, and I can not tell just what that is; it varies according to the work done.

Charles Stookey, Belleville, Ill.: I may be considered an amateur in the tile business, and also a pioneer. We established a factory at our place in 1879, as Gooding & Stookey. A year afterward I went out of the business and left my partner to run it, and this winter I have taken charge of the work again and Mr. Gooding has retired, being over seventy years of age. We have made some brick, but not very many. We are now making drain tile. We pay $1.50 a day for ten hours' labor.

J. J. Gledhill, for E. M. Freese & Co., Galion, O.: So far as I am acquainted with the inside facts, our people have had a very satisfactory year the past year. If this means prosperity, they have certainly been prosperous, for they have been busy all the year. As for myself, I am still holding my job.

Elder & Dunlap, Bloomington: We have had a very successful year. We sold all our brick early in the season, and could have sold many more if we could have made them. However, our books will show a balance on the wrong side of the ledger, for we have put the profits all back into the plant, and are making a number of improvements. We are well satisfied with the year's business. So far as our clay screen business is concerned, that also has been very

satisfactory, especially the latter part of the year. We now have eight or ten screens in course of construction. We pay 12½ to 14 cents an hour for common labor. We pay them according to what they are worth.

T. A. Randall, Indianapolis, Ind.: There is one side of the reports so far made that is very gratifying, I think, to all of us; it is to me. Up to the last Convention this feature of the programme was for several years anything but cheerful. The reports were very unsatisfactory; everybody was talking about the good times in years gone by and the bad times then existing. Last year there came a change; a little ray of sunlight was let in, and the members began to talk of prosperity. Now the cry is changed from prosperity to expansion. The expansion of trade interests is surely satisfactory to all of us. The Clay-Worker, of course, feels the effects of the prosperity you are having, and we are feeling pretty good ourselves, I thank you. The attendance seems a little slim this morning, but I believe before we are through with this meeting the attendance will show an increase over that of former years. In behalf of the National Brick Manufacturers' Association, I can say the prospects are good for the largest attendance at Detroit that we have ever had. I think we will have one of the best conventions in the history of the Association, and every member of this Association is cordially invited to attend.

W. L. Emerich, Chicago: We have had a pretty good year with the exception of a few months we have been fighting our brother brickmakers, owing to a combination we had. I will not air my troubles here. We make pressed brick, and pay 15 cents an hour. In the paving brick line (we do not make, but buy our paving brick), business has been very good. We sold about 8,000,000, and expect to sell more this year.

John Maddigan, Peoria: Mr. President, and Clayworkers of the State of Illinois, including the machinery and kiln and furnace men and editors—I feel that I ought to return thanks to Mr. Loy for the compliment he has paid me for showing him around Peoria. I manufactured last year a little over 3,000,000 of soft mud brick, and something over 2,000,000 pressed brick. So far as labor is concerned, in our city the laborers control themselves; they fix the wages themselves; they work for from 18 cents to 25 and 30 cents an hour. We have done very well the past year. As you all know, competition is very strong in Peoria from the outside towns. Take the little city of Chicago; they make a good many brick there; and then there is the little town of Springfield, and a good many other little towns in the State, and we come into competition with all of them; but, taking all in all, we have done pretty well, and have about 2,000,000 brick in stock.

F. E. Swift, Washington, Ia.: We made about 1,500,000 stiff mud brick, and sold all but about 2,500 at $6 a thousand. We started in on drain tile in November, and expect to run on drain tile the rest of the winter, as we have done for the last ten years. The first of January we had about 3,000 brick and tile both on hand, the least we have had for ten years. I have leased my yard to my son, and he will run it the coming year. In the kiln line I have done a good business, and expect to give all my attention to it the coming year. We pay from 12½ to 15 cents an hour for common labor, and pay bricklayers from 25 to 40 cents.

J. R. Campbell, Washington, Ia.: I am just a beginner in the brick business; in fact, haven't started yet, any more than I have been out selling Mr. Swift's furnaces, and, as we sell quite a good many, I judge that business must be pretty good, or else you would not buy them.

G. C. Stoll, Secretary, Wheaton, Ill.

L. H. Martin, Dwight: I have had a fairly prosperous year; run but eight months; make drain tile mostly. Made about 500,000 tile and 200,000 brick. We paid 15 cents an hour up to the first of September, but now we pay 17½ cents.

J. P. Fargo, Streator: I do not know that it is necessary for me to make any statement. I am superintendent for Mr. Plumb, and he has given you all the facts necessary.

J. J. W. Billingsley, Indianapolis: In looking over this meeting, I am impressed with two or three things. A great many of those present at the first meeting of this Association, twenty-two years ago, have passed to that other world; a great many who are still living are not present this morning. There has been quite a change in the general appearance of the Convention. For several years after the organization we used to crowd the halls, and then there came a time when business was not so good, drouths came, and there was a stringency in money matters, and one thing and another, and so changes have gone on. Two or three years ago our business was very much depressed. I am very glad this morning to report that, so far as I have any knowledge, especially in the drainage and drain tile interests, the interest has been increasing in the last two years. I have inquiries from many places in regard to the tiling interests, such as I have not had in years gone by, and so there is a continual expansion of the business. When we take into account the rapid increase of the population in this country of ours, it is very clear to every observing mind that all the waste places must be brought into cultivation, the waste lands must be reclaimed, and the drain tile interests will increase as the years go by. There is no question about it. I do not speak of the brick interests, for the reason that it is quite generally known that the amount of capital that is invested in this business speaks for itself. I presume that twenty years ago the magnitude of the clay interests was not anticipated by any of us. It did not occur to any of us that in the years to come there would be any such investment of money and talent in the business. I am very glad it is so. I am glad for the future prospects of this Association and the clay interests generally. I am very glad to be with you to-day. I believe I have only missed one, possibly two, of the twenty-two yearly meetings, and I am glad to be here to-day. (Applause.)

E. J. Hess, Chicago: Representing the Celladon Terra Cotta Co., will say that the last year was the best ever known in the history of our company. We have two factories, one here and one at Alfred, N. Y. These two plants were run continually until the plant at Alfred burned down, the first of September. We are rebuilding, and have the plant nearly completed, and, when finished, it will be the most complete and best equipped roofing plant in the world. The rate of wages paid at the two plants have been a trifle over 15 cents an hour. A large part of the work is piece work, at which the men make 25 cents an hour.

W. H. Hurlburt, Macomb: I represent the Illinois Mfg. Co. As a sewer pipe man, I do not know that I can interest you gentlemen very much. Our plant is known as the W. S. Dickey Clay Mfg. Co. They have four large plants. They ship their goods all over the Western States. Like Mr. Randall, we believe in expansion. Some months ago we shipped thirty-five carloads of pipe into Mexico. We expect to follow them up with more. We do nothing at all in the brick line, and very little in tile. We manufacture what we consider a very fair article in sewer pipe. I think a lit-

tle later in the day you will have an opportunity of seeing a sample here in the hall. Of course, we have had our troubles getting fuel, but the past year has been one of the best years in the sewer pipe line that the manufacturers have experienced in five years. It has been simply a case of get the goods; there is no difficulty to sell them. We will be glad to see any of you at our factory in McComb and show you how we handle our clay.

C. A. Harbaugh, Mendota: I do not feel competent to address this body of men just now. I am a young member, only about four minutes old, in this Association. We have had a very successful year. We manufacture nothing but tile—drain tile—and have sold all we could make. I have had to ship a good many of the tile, but I prefer to save freight rate and sell my product at home. I am paying my best help $1.50 a day; about one-fourth of them get $1.25, and from that down to the boys who get 75 cents a day. Some of my men, who do work that anyone could pick up, get $1.35 per day, and they are satisfied to take that and have regular work instead of doing other work that would not be so regular.

J. A. Wilson, Pawpaw: I have not much to offer this morning. I have had a very successful year at both our plants. Our wage scale is from 14½ to 15½ cents an hour. We have had a very prosperous year at very fair prices. We have been having close prices on account of the shipping rates, but we are now on the road to better prices. The scarcity of an article always raises prices.

W. N. Pratt, Earlville: I had a very satisfactory year. The trade is not so extensive where we are as in other places, but it has been very satisfactory. The scale of wages is $1.50 a day, or 15 cents an hour.

Secretary Stoll: This ends this part of the programme for the present. Other members will be here this afternoon, when they can report.

President Townsend: I cannot help but be impressed by the number of new faces here. I know the officers appreciate it. Our annual banquet will be held to-night at the Cliffton House. We will meet a number of Ottawa citizens, and I am sure we will have a pleasant time. A motion to adjourn is in order.

On motion the Convention adjourned to meet at 2 o'clock.

SECOND SESSION.

The second session was called to order by President Townsend at 2:30. There was a gratifying increase in attendance, the morning and noon trains having brought many delegates, who swelled the crowd materially.

President Townsend: Gentlemen, we are pleased to have with us this afternoon the Mayor of Ottawa, the Hon. Mr. M. T. Moloney, who will now address you. (Applause.)

MAYOR MOLONEY'S WELCOME.

Mayor Moloney: I assure you, gentlemen, you embarrass me very much when you attempt to applaud me. Of course, you do not know me as well as the people of Ottawa do or as well as I know myself. If you did, you would not be surprised at my telling you that my chief failing in life has been my modesty and my bashfulness. (Laughter.) However, my friends, I am glad to meet you here this afternoon. I am glad to see the clayworkers of Illinois in their annual meeting, and in coming together in this city, as the chief magistrate, it is with special pleasure that I tender to you the hospitality of our city. I do not know what to say to you that would interest you. I have not, since I left the University of Virginia in 1871, put anything in writing, and whenever I talk I do it off hand, as it were. To attempt to talk to you about what will be most in-

D. O. Loy, Atkinson, Ill.

teresting to you would be attempting an impossibility. I remember the saying that "Fools step in where angels fear to tread," and as I do not know anything about clay in particular, except a great deal of mud that we have in the streets, now, gentlemen, I think I had better not try to go into a discourse on clay or clayworkers or the clay business, because if I do I will certainly put my foot in it, and I do not desire to do that. I always have believed in that old saying that is attributed to the shoemaker, "each party had better stick to his last." My chief forte, as you can see, is not in discussing the subjects that brought you here, and yet you will permit me to say that, since I have had the good fortune to quit the practice of law and enter an honest and orderly business (laughter), my business being that of the gas and coal company, I have taken more interest in the business affairs of our city and our county, and also the State and Nation generally. From a geological standpoint, I know nothing whatever about clays, and yet it seems to me from what I have read that in this county we have a great many kinds of clays. These clays are manufactured into different products, which are being placed on the market. As you know, we have the Pioneer Fireproofing Construction Co. here. It is a very large undertaking, and they are turning out vast quantities each day. Then we have the Standard Company, and then we have a few more. We have a terra cotta works; I understand there are very few in the country of the kind. Then there is another large factory at Twin Bluffs, a few miles from town. So you see you are well represented in this city. The Standard Brick Co., which is owned by capitalists here, have another plant at Dayton, a few miles from here. I have been told by people who profess to have given a great deal of time and thought and consideration to the different kinds of clays that are found in the county that we have all the different kinds of clays here in this city and this county. When I thought over this matter last night, after reading an interesting article on this subject, I became convinced that it would be impossible for me to attempt to master the subject so as to be able to talk on it intelligently, and, therefore, I made up my mind I would abstain from attempting impossible things. And now that you see how little I know on the subject, it would be worse than "carrying news to Newcastle" for me to try to enlighten you. When we hear talk of gold and silver mines, we wonder why people are so attracted to them. They inquire about them, read about them, people are tempted to go seek their fortunes in these mines, and yet it is true to-day that, so far as producing commodities for the benefit of mankind, for the necessities of mankind, for the supply of their luxuries, the business you are engaged in is of more value to the world than all the gold and silver and diamond mines in the world. Your industry is, of course, an ancient one. The industry of turning out brick is as ancient as the world. I understand there are brick to-day, for example, in the old land in Egypt, that are estimated to be 300 or 400 years old.

Now, gentlemen, knowing that you are anxious to get through with the business that brought you together, that you desire to exchange ideas one with another, and it is only by the exchange of ideas that progression follows, and that you have a banquet to-night at 10, a time when all good people in Ottawa go to bed—especially since I have become Mayor—I will not detain you longer. Since you are the guests of the city, however, I want to say that you can stay up as long as you want to—you can stay up until clear daylight. You can do this

because the keys are going to be turned over to your president in a very few minutes. If any of you are so inclined, we will take you to church—if you are otherwise inclined, we will take you to other places. (Laughter.) Our police officers will treat you very nicely. Your president will have the keys so long as you remain with us. I hope you will enjoy your stay in our city. I hope you will not only visit the plants of which I have spoken, but that you will see other plants and factories. In the past we have been called mossbacks, but I assure you it is not so. Ottawa is going to be one of the most progressive cities in this State. We have now building one of the largest plate-glass factories, not only in this great land of ours, but in the world. When you adjourn, I trust you will adjourn to meet here again. We want you to come back again. We have a population of 15,000 or 16,000 now. I see Senator Plumb, who lives at Streator, a little town sixteen miles from here, is with you to-day. He says they are larger, and have a greater population than we have, but I want you to come back when we have annexed Streator, and we will have our population nearly doubled, and we will give you a royal good time. I now tender to your president, and through him to you, the freedom of our city, and I welcome you again and again, and sincerely hope you will find your stay among us a pleasant one. (Applause.)

President Townsend: Before taking up the regular order of business, I desire to announce the

COMMITTEE ON RESOLUTIONS.

W. H. Hurlbut, Macomb, Ill.
M. L. Emerich, Chicago, Ill.
J. M. Elder, Bloomington, Ill.

Secretary Stoll: We will now again take up the reports of members.

M. Deering, Peoria: I cannot answer so far as labor is concerned. I do not employ any. I am just a representative. In Peoria, during the year 1899, the increase in building was 23 or 24 per cent. more than in 1898. In 1899 two and one-half miles of street pavements were laid. We have had a good year in 1899, and expect a better one in 1900.

J. D. Jensen, Pekin: We have done very well, done all the good we could, and we are not done with our last year's work. We pay $1.75 a day for our common labor.

M. Schmidt, Secor: The season has been a good one, with favorable prices. Our wage scale is $1.50 per day.

Robert Unzicker, Peru: I have no report to make. I am glad to be here to meet my old friends and make new ones.

S. H. Alsip, Belleville: I am not a manufacturer of brick, but am in the class with Mr. Eudaly, Elder and others. I employ no common labor.

Geo. Gillen, Cantrall: Though I have seen better years than 1899, business has been fairly good, but not as good as I would like to have seen it. The prospects for 1900 are far in advance of what they were in 1899. We pay on an average $1.50 to $1.75.

H. B. Skeele, Chicago Heights: Business has been fairly satisfactory. I am in the same business as my colaborer, Mr. Hess. We are trying to keep people out of the rain by making roofing tiles for them. I think he will bear me out in the statement that the only thing in the building material line that has not advanced in price is roofing tile. We are working along at the same old price, with increased expenses. We pay $1.50 a day for common labor.

F. A. Martin, Mazon: The year 1899 has been a fairly good one, and the prospects are good for the coming year. We pay $1.50 a day for common labor.

W. H. Steep, Seneca: Business for 1899 was fair; prospects are better for 1900. We also pay $1.50.

F. R. Carter, Peoria: This is my first year in this State, and it has been a good one. We pay $1.60 a day, on an average, for common labor.

Secretary Stoll: The president's annual address is the next thing on the programme.

PRESIDENT'S ADDRESS.

Gentlemen of the Convention—It is an honor to be president of any organization or association that enrolls the names of as many honorable, energetic, inspiring citizens of our country as does this association, but this year, with its record of success and its expansive characteristics, adds luster to the association and places the president in a position the incumbent feels incompetent to fill.

While reviewing the past year it is almost impossible not to be startled when

W. H. Hurlbut, Macomb, Ill.

contrasting it with the past few years. While my experience is quite limited as compared with many older members, yet my thought is that remarkable changes will be presented in the next statistical report of the clay industries of our State, and that we will gain another point in rank at least in some of the lines of our great industry.

The past year has been full—in fact, heaping full, almost to running over, and the effect has been an impetus that to my mind will last for years to come. The hope which was in every heart and so freely expressed at our meeting last year at Peoria has been fully realized.

Nearly all lines of industry are represented by an association that meets annually, for mutual pleasure and advancement. In fact, it has become almost necessary to have associations and conventions to carry on any line of work. I believe associations of this kind are a power. I believe the commingling of the people, the binding together of those especially in the same calling elevates the individual, broadens his views, stimulates him to greater activity and collectively is an inspiration that is far reaching in its results.

This convention should, and, I trust, will be, emblematic of our year's work, and to that end I hope every one is full, not has been or will be, but is now full of experiences that can and will be shared by the convention profitably. To each member there is a certain amount of credit given by the association, and it rests with the members themselves whether or no that credit is misplaced.

No undertaking pushes itself. Some must push and push and keep pushing to make the wheels of commerce revolve. A social enterprise must be pushed by some one to make it a success, for even the chronic gossiper, the most expensive church or the largest congregation availeth naught unless there are some tireless pushers. On the other hand, continued pushing in anything or in any one line eventually brings success to some degree, and to make a successful association or a profitable convention a large amount of hard, continued pushing must be done.

Brother Stoll has been pushing all the year and is willing and is going to keep pushing all through the convention. We must not ride a free horse to death, but rather take the burden ourselves as far as possible and make this the banner convention, relieve our secretary for the time being and cause a rose-tinted blush to cover his smiling countenance, thus modestly confessing success of his efforts.

Statistics show the value of the products of the clay-working industry in our State for 1898 was over six million dollars, and for the year 1899 it will probably be a large per cent. greater. No other industry, I believe, embraces as many branches of commerce as does the clay worker; the common opinion would not grant it. Every home, no matter how poor the surroundings or furnishings, has samples of our trade, and it has grown so that to-day the larger the home or building and richer the furnishings the better are we represented. Nothing else that is so generally used and has become so essential to man's needs is found that is the complete result of one trade or industry.

With this thought in mind are we, as members of an association that represents an industry that is as far reaching in its results, doing what should be done? We have profitable conventions and no one can regret being a member, but should not more be done to bring out the true merit of our industry? Attention has been called to an exhibit at our state fair, but so far it has been far from what it should be. Last fall indications pointed to a creditable display. I feel partly to blame that it was no better, but circumstances were such that I could not give it proper attention. No particular authority was given me, but had other work not crowded so fast I would have pushed it some anyway.

At this meeting I feel something definite should be done that will insure success another year. The cause is a worthy one and should meet the hearty approval of all and be proven so by proper action before we adjourn.

Again insisting that this is your convention and that the many new members are as powerful a factor as many older ones, and that they are expected to assist in making this convention a success, I close with thanks for past favors and your kind indulgence for my shortcomings.

Secretary Stoll: The first number on the programme is a paper on "Continuous Kilns," by E. J. Hess.

AN UNEQUAL PARTNERSHIP.

By E. J. Hess, Chicago.

Our Secretary, in asking me to prepare a paper to read before this Association of Clay Workers, suggested three subjects—viz., first, "What is a Successful Clay Man?"; second, "The Continuous Kiln," and third, "An Unequal Partnership."

With three topics suggested and an unlimited amount of time at my disposal, I agreed to accept the honor of appearing before you and prepare the paper, using one of the above-mentioned subjects, or, with Mr. Stoll's permission, any other I might choose. You will notice here the generosity of our Secretary, and also his poor judgment.

The selection of a suitable subject is not always an easy thing, and, realizing this, I spent very little time (just five weeks) in deciding not to use any one subject, but to start and write, without any regular plan, as many clay men do, and see where I would land.

It is too true that many men try to run their business without having any definite system or plan, and I have been told by one of the officers of this Association that it is a serious thing for a clay man to be struck with a deep or sensible thought. However serious this may be, I have been afflicted with one, and I will try to bear up under it while I watch you suffer. Before going further, it might be well for me to say that at this point in my attempt to become a "successful clay man" I am seated comfortably in a coach, which is being pulled rapidly away from Ann Arbor toward Chicago over the Michigan Central. This, however, is offered only as an explanation to show under what disadvantages I am attempting to write something to please, rather than to instruct, as suggested by Mr. Stoll, and should in no way be construed as a reflection against Ann Arbor or the Michigan Central Railroad.

Ann Arbor is a nice little city, and is quite noted because of its great University. Had it not been for this University we would never have known of a young man who received a great knowledge of the clay business by attending there one year. Having completed a whole year's course in Greek and Latin, triginometry and literature, he felt that he was well prepared to start into the clay business. He remembered that on his father's farm was a vein of clay, which, others had said, would make a good drain tile, and, as the surrounding farms were low and wet, he knew there would be a good demand for his product. He reasoned with himself that he possessed more than ordinary ability; was endowed with good health; had a strong physique and plenty of money, all of which are essential to a successful clay worker, but he was reminded also of the great amount of hard work connected with the business, so he decided to seek a partner.

The friends of U. N. Practical, as this was his name, knew he would make a successful clay man because he had failed in everything else; so they assisted him in getting S. U. B. Stantial as a partner. This new partner was of mature years. He was known to be upright and solid, and he possessed the necessary ability, tenacity and grit (as a clay bank should) to make a substantial factor in the business. In his veins was the substance that generations had produced and of which coming generations may well be proud. The first partner impressed the observer by his outward appearances, while the second was conspicuous because of the real depth under the surface.

Having made satisfactory arrangements, it was decided to erect a plant and begin operations at once. The work of construction and selection of machinery was to be done by U. N. Practical, who began to think where he could buy his machines, but he hadn't finished thinking before he was visited by representatives of the American Clay Working Machinery Company, Wallace Manufacturing Company, Freese & Co., the Frost Manufacturing Company and several others, everyone having the best and only machinery and appliances suitable for working his particular kind of clay. Good advice was offered by the President of this Association, by Messrs. Pike Eudaly, Purington, Plumb and others, but U. N. Practical would not listen to any one but Mr. Randall, who assured him that if he would read the "Clay Worker" and follow its teachings his efforts would surely be crowned with success.

The building was finally completed, the machinery set in place and everything was ready to run tile, but U. N. Practical was

G. W. WALTERS, Chatsworth, Ill.

disappointed when the tile didn't run as the machine maker said they would. Experimental runs were made each day for a week, and still not a good tile in sight. The Superintendent's stock of fitting sayings was exhausted, and failure seemed to confront him at every turn, but some changes were made in speeding the machinery, the clay was more thoroughly pugged and finally full lengths of odd-shaped tile were standing on end in every available spot around the machine. The machinery was stopped and enough clay for a week's run was around the machine and cutting table. The further experiments, trials and tribulations of starting this clay plant I am not allowed to make known, as Mr. U. N. Practical is preparing a book on 'Hints to Clay Workers," in which will be told ten thousand things that no one but a clay man could ever have known.

Our College tilemaker soon saw his drain-tile plant in successful operation, and the floors of his dry rooms covered with holes, each surrounded by a wall of clay varying in thickness from ⅜ to ¾ of an inch, and ranging in length from 11 inches on one side of the tile to 12 on the other. These odd-shaped tiles, being partly dried, were set into the kiln and the fires started. The burner had instructions to "rush the thing along," as too much time had already been lost and customers were waiting for their tile; so the "thing was rushed," and when about half the contents of the kiln had been drawn through the fire holes and the arches were well filled with clinkers and melted clay, it was decided to quit firing and "let her cool off," so as to see what was on the inside. The next day, in his anxiety to see the results of "the first kiln," U. N. Practical tore the door of the kiln down and was rather pleased at the clinking and musical sounds to be heard inside, but he didn't like to see so many pink tile with slabs as large as his hand off the sides. So far the experiments were carried on without any regard for S. U. B. Stantial, who plainly showed that the tile, after being cut and thoroughly dried, should be properly set and bound in the kiln and then more slowly fired. The second kiln was more carefully set and the warnings of S. U. B. Stantial more closely observed, but the burner had instructions to "burn her hard enough" this time, and when S. U. B. Stantial indicated by appearances that enough heat had been applied the other partner insisted upon a hard burn, and—he got it. Instead of being pink the tile were black, and instead of being removed carefully from the kiln they were rolled out in huge masses, and U. N. Practical suggested that if the clay, which had been so nicely melted together, be properly piled, it would make a good fence around the hog lot, as that was the kind of dirt no rooter could touch, and it would save the expense of ringing their noses. The interesting story of the manufacture of drain tile from this point to the time that great success and wealth is attained will also be found in U. N. Practical's new book of "Hints to Clay Workers," which will soon be printed by the Clay Record People. Having finally been successful in the manufacture of drain tile, and the business having been worked to a paying basis, U. N. Practical began to realize that the demand for tile for drainage purposes would soon be decreased because the surrounding country had been pretty well drained, and by this time other factories were in operation in the same part of the country. He realized that he had reached a point where he was making no progress, and knew that stagnation meant nothing else than starvation, since there is no such thing as standing still in the business world of to-day.

Rather than to go backward, he decided to take a step forward, and he signified to his partner his intention of making brick to supply the local demand. This question had already been solved by the substantial partner, who knew well his own capabilities, and, before the plans of the partners had fully matured, they were again visited by the many gentlemanly and "ready-to-please" salesmen, who offered to sell dies at cost price and send cut-off tables on thirty days' trial. One of these liberal offers was accepted, and after very little experimenting good side-cut brick were being made. The wide-awake brick and tile maker had visited a plant where Grath's Patent Coking Tables were being used, and they were such an improvement over anything he had ever before seen. He first made sure that he could not be sent to the penitentiary for using them, and then had

them attached to his kilns. As the season advanced business increased, and the happy clay man, who had such a good partner, began to picture himself as one of the greatest of clay workers.

Only one more step, and he would reach the highest pinnacle of fame. He had read accounts in Brick, the Clay Record and the Clay Worker of how the same amount of clay put into a thousand brick for $6, if made into roofing tile would sell for $50, and he knew of no better way to get rich and become famous than this. He began to make investigations, and, representing himself as a prospective purchaser of material, he visited one roofing-tile plant, and, disguised as a salesman of oil and babbit metal he got through another. He observed the kind of machinery used, the way the clay was handled, how the plaster dies were made, the style of kilns used and the method of setting the tile in the kilns. With this full and complete knowledge of the roofing-tile business he went to his partner and made known his intentions. The conservative old partner seemed to say:

"Be not the first by whom the new are tried,
Nor yet the last to lay the old aside."

But this only tended to make U. N. Practical more determined, and he began to tell of his visit to the roofing-tile plant at Ottawa, and how the clay, taken at the side of the building, was finely ground and in a few minutes later, in the form of tile, was falling off the dies of the big press like so many dollars coming through the mint. He explained how the tile, when dry, were wheeled out and set up in pockets in the continuous kiln.

This kiln, he said, is oblong in shape, and inside of its walls, which are six feet thick, with air spaces between, is a circular tunnel of sixteen chambers, or apartments. Each apartment is fourteen feet long, six feet wide and eight feet high to the center of the crown. Each chamber has an opening into the main flue, which is under the outside wall, through which the draft is given to the big stack at the end of the kiln. The coal, which is the finest slack, is fired from the top of the kiln through small openings into a checkered work of brick known as the combustion chamber. The burner told him that great care had to be exercised in setting the combustion chambers properly, so as to distribute the coal evenly and allow only the right proportion to fall to the bottom.

He continued telling his old partner how cheaply this kiln could be operated, and that only nine thousand pounds of slack coal are required to burn off a chamber large enough to contain six thousand brick. He contended that such a kiln would not cost more than $8,000, inasmuch as they could make all their own brick to build it, and U. N. Practical was satisfied he knew enough to build it without the assistance of an expert kiln man. With such a kiln and one new tile press he felt that roofing tile could be made as cheaply as common brick, and if they would sell for ten times as much he knew he would be warranted in borrowing a few thousand dollars to make the necessary improvements. He admitted his lack of ability to market a product, but he insisted that he had such a knowledge of the roofing-tile business that he could make tile that would sell themselves, but when he woke up he thought he had heard his careful old partner say to him:

"You who seek to give and merit fame,
And justly bear a critic's noble name,
Be sure yourself and your own reach to know,
How far your genius, taste and learning go;
Launch not beyond your depth, but be discreet,
And mark that point where sense and dullness meet."

This started him to thinking, but he had refused to take advice from any one but the Editor of the Clay Worker, and this advice was to be followed. The new press was purchased and the big kiln was built. The machine maker furnished a pattern of tile that was made by his ancestors in Germany a hundred years ago, and it was supposed to be especially good because the same pattern of tile had been made for a century and it had "Patent" stamped upon the back. An expert die maker was hired from one of the factories already in operation, so after the first few days they had no trouble in getting the clay to relieve from the dies, but the tile could not be dried without warping and cracking until the clay was properly weathered and pugged.

The regular amount of trouble was encountered in burning the first kiln, but finally some well-burned tile were put upon

J. J. W. Billingsley, Indianapolis, Ind.

the yard, and all that could be said in their favor was that they were well burned, and this was a very strong point. With nicely selected samples of the newly made tile the very wise manufacturer visited the leading architects for the purpose of inducing them to use his material. Before the day was far spent he found that at least a dozen different shapes and sizes of tile and trimmings were necessary for every roof; so he went back home to make the other eleven. A season had passed and the various shapes were made, but the money was gone and the mortgage was due. Operations were suspended and the plant was sold, and as he sat in his cozy little home he thought how comfortable it was, how complete in all its appointments.

How happy he had been in it. Here he had planned his triumphs, won his success, enjoyed his victories, and now a peculiar expression came over his face as his mind reverted to his college days, when his greatest anxiety was for position, prestige and rank in the world, where rank was measured by accumulation. He delighted to think of himself standing on what he had heaped up and looking down on those who had failed or those who were still eagerly striving to equal his success. He did not expect to be valued for himself, but for the power he would represent; and now what could he be without that power? A Failure! He had climbed up, only to be hurled down, and his friends would now laugh at him. But as he sat there thinking to himself he was reminded of his faithful old partner, whose very nature had served as a warning to him, and he remembered the old saying that "It is a wise man who knows when he has enough, and it is a successful man who never goes beyond his depth in business." Success does not imply the accomplishment of something great, or the doing of something momentous, or the accumulation of wealth, but simply the favorable termination of something undertaken. So I leave it for you to decide what a successful clay man is. While U. N. Practical realized that he had formed an unequal partnership, S. U. B. Stantial was convinced that his partner had been operating a slow and "continuous kill."

At this point President Townsend asked Mr. Billingsley to preside. He was greeted with applause when he took the chair.

Chairman Billingsley: We have been favored with a very pleasing paper, and it is now open for discussion. It may be that you may have some questions to ask the writer.

Mr. Randall: We have a new member who has just come in and who, I think, is capable of discussing this paper, particularly as he has heard but little of it. (Laughter.) I refer to Dr. Converse. (Applause.)

Dr. Converse: The gentleman has hit it about right; I can always talk better about things that I know nothing about than on things that I do. I really did not hear all of the paper, and I do not know what it is about, but I think it is a very good one, judging from the applause, and I joined in with you. (Laughter.)

Chairman Billingsley: It has been suggested to the chair that the next subject under consideration, the "Lessons of Hard Times," by Mr. T. P. Plumridge, be passed over for the time, as the writer has not arrived yet, and is likely to come in this afternoon, and his paper can be heard to-morrow. The writer of the next paper, "Tile Laying in a Drainage District," is also absent, but as the subject is one of considerable interest, it is desired that some discussion be had on the subject, and I have been requested to ask Mr. J. M. Powell, of Orestes, Ind., to give us a little talk on this subject.

"FARM DRAINAGE—ITS BENEFITS."

Mr. Powell: I feel entirely incompetent to discuss this question. While I am in the drain tile business, and have visited many of our drainage districts, and have seen a great many tile laid, and all that, I am not able to discuss this question in a manner satisfactory to myself. However, I wish to remark that in the last few years tile drainage is being pushed, farmers are beginning to realize that it is possible to reclaim land by underdraining with great advantage to themselves. A few years ago we could not put down large drain tile. There were large ditches, and all over Indiana in the wet places these ditches were open across the farms, and made it very unpleasant. They had to go to a great expense in the way of keeping up

floodgates, and now that they are closing up these ditches and buying large tiles it is much more successful. I want to say, as a tile manufacturer, my demand has been almost exclusively for large tile. I believe the time is close at hand when the tile business is going to be run on a larger scale. That is, the demand will be for larger tile. The State of Illinois is also now underlaid with small tile, which gives ample drainage if it has the proper outlet, but not having the proper outlet these laterals will fill up and become useless, and now the farmers are beginning to fill up these ditches. I think these remarks will, perhaps, bring out something on this subject.

Secretary Stoll: How do the farmers proportion out the cost of these tiled ditches? How are they assessed for these advantages of the tile drains? What are they charged? Does the farmer who has a farm lying closest to this ditch pay more than the other man?

Mr. Powell: That is according to the benefit. We have three ways of determining this. The most popular is that of appointing commissioners. The commissioners appoint a body of men as jurors, and they go over the land, and the man who gets the most benefit from the drainage is taxed more heavily than the man who is farther from the ditch. This is a just way, and one that proves satisfactory to the farmers. In this way the drainage is not very expensive, even to the small farmer, and the farmers are beginning to realize that they can band themselves together and select disinterested parties as commissioners, and they save themselves all the way from 20 per cent. to 30 per cent. It is the best means that we have found.

Mr. Cunningham: The commissioners in Clinton county, where I live, follow the rules laid down for sewerage—that is, they put in manholes and cover them up just as they do in sewer mains, so that a man can get down into each ditch and clean it out where it gets clogged up, just the same as in sewers.

Mr. Townsend: My understanding of a drainage district is that certain territory is placed in a district, and all the land in that territory is assessed a certain tax, collected by the county collector the same as any other tax, and bonds are issued against that territory. I know in my county there is a drainage district, and there are a number of people living in that district who are trying to get out of the taxes because they say it does not do them any good. In this way all the land is drained, irrespective of results, if it gets in the district.

D. O. Loy: I have had some experience along that line. I have noticed that in forming a drainage district it is sometimes impossible to get a man into the district. He will become interested after the ditching is done, and, as I take it, the question is, How can the people get in after these districts are formed? A district is formed and so much territory taken in, and then assessments are made to drain off the land, and then sometimes there is land that the owners do not want to pay for, and yet, after the assessment is made and they realize the benefit, they are always willing to do the paying.

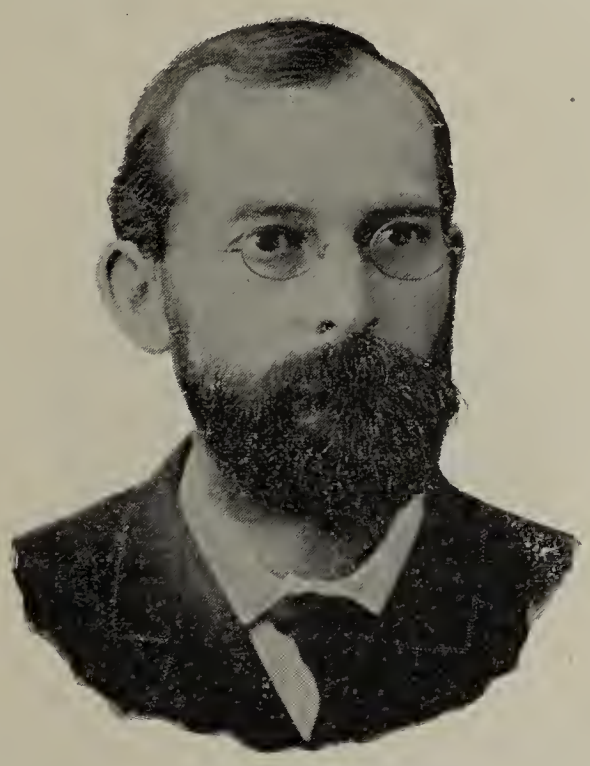
Mr. Powell: If, when they are forming a district, the commissioners find a man who does not want to pay his assessment, and then, after the draining has been done, he wants to come in, they allow him to come in and pay the full amount of the assessment. Where it is once decided that a man should not be assessed he has no right to be in that district.

Chairman Billingsley: While you are on the floor, I want to ask you what depth is required in laying large tile?

Mr. Powell: It is best to lay them at least three feet below the surface.

Secretary Stoll: I would like to hear from Mr. Pike. We have been talking about tiling in a drainage district. You have been doing a lot of tiling on your land near South Bend, Ind., and we would like to have you tell us how deep you lay your largest tile, and whether you have a drainage district up there?

Mr. Pike: I hardly know what the Secretary is asking. I am but newly initiated in this lodge and know nothing about it. (Laughter.) If you will let me get more acquainted, and let me know where I am, I will try to talk. I have been all day trying to get to this Convention. I found Mr. Skinner and brought him with me. I am not in a drainage district; we have no combination of that kind. We do our own tiling



W. R. CUNNINGHAM, Frankfort, Ind.

and pay our own expenses. The largest size tile that we are using is 12½ inches.

Mr. Billingsley: What fall do you allow your tile? How do you get the best results?

Mr. Pike: We have seven and a half feet to the mile. I believe in deep drainage. I believe in putting them in well. I put them in three feet and eight inches from the surface to the top of the tile. My idea is that if you put them in deep they are more satisfactory. What you save in digging you will lose in your tiling. I put my drains twenty rods apart, thinking to put in a line between, but as yet I have not put any more in.

Chairman Billingsley: Gentlemen, if there is any information you want to get from Mr. Pike, now is your time.

Mr. Harbaugh: We want to lay about four miles of tile. What capacity of tile would you take?

Mr. Pike: I would say large tile.

Mr. Eudaly: Do you cultivate any of your land where you have used these drain tile, and what do you raise?

Mr. Pike: Yes, indeed, I cultivate it, and I raise corn and oats.

Mr. Eudaly: Do you think it pays to drain your wet land?

Mr. Pike: Yes, indeed. Now, Mr. Chairman, may I come up and claim my stipend.

Chairman Billingsley: Mr. Pike, you may report to the Secretary and get your pay. (Laughter.)

Mr. Gillen: We have a drainage district at Manito, Ill. We have put down thirty-six miles, and the people were undecided as to whether they should do the draining, and we finally left it to the vote of the people, and it was voted that we should have the drain. They appointed three commissioners. The soil is a very dark, heavy loam, and underneath is a layer of gravel, and where they put in open ditches and laid the tile the tile are now high and dry. This is the first work that was ever done, and water passed away in the strata of gravel. They have another drainage district between my place and Springfield. They had to open up the ditch and lay the tile in, and then left it to the vote of the people, and each one pays his proportion; the one that is closest to the ditch is benefited the most and has to pay the most. They issued bonds, payable in ten years, and we pay so much each year. I think this is a very good plan. Wherever there is wet land, especially down along the river, thousands of acres can be reclaimed that have been useless for years, and I think the time has come when all this waste land should be reclaimed.

Chairman Billingsley: While this subject is very interesting, we will have to pass on to the next, which our Secretary will announce.

Secretary Stoll: The next is a paper on "Our Exhibit," by Dr. Converse.

Dr. Converse: I felt pretty blue when I came into the room. I have a tacit understanding with Brother Pike that we shall applaud each other, and since he has come in I know I am safe. I was so mixed up on the twentieth-century question that I hardly knew where I was at, and so did not prepare my paper until the last moment. I got a call from Mr. Randall, saying he wanted my paper, and the result was I hurried and scratched it out and sent it to him, but I had not seen it since until he handed it to me just now. If there is anything good in it, it is mine; if there is anything bad in it, you can lay it to Randall. (Laughter.)

"OUR EXHIBIT."

By A. L. Converse.

If I was asked where and how, in my judgment, can the most people of this and adjoining States learn of the real value of the products of the clay industries I should say without hesitancy at the Illinois state fair. If I was not a citizen of Springfield (the place where that fair is permanently located) and any one should ask me where in the United States is the best state fair located I should with readiness respond in Springfield, Ill.

I do not know that any one is going to propound either of the aforesaid questions, but I have suggested them in this hypothetical form for the purpose of emphasizing my faith in the state fair of Illinois as one of the best, if not the best, places for an exhibit of our products. In a recent conversation with one of the citizens of this State who has traveled extensively in this and the old country I was informed that nowhere had he seen the equal in

natural and artificial equipments for exhibition purposes to the grounds of the Illinois State Fair Association.

The making of brick is as old as the records of antiquity, but the allied clay industries and modern methods of handling and manipulating clays is so new and the variety of uses to which clay products are put are most of them so new that those who have made the subject a matter of study readily conclude that verily the clay industry at this writing must be in its infancy.

The development of the resources of a country for the benefit of the people of that country is an act of true patriotism, and the individual that contributes most to such developments is entitled to the greater praise. Strange as it may seem, public benefactors as a rule reap great personal rewards. Such being the case, have we not a right to expect that by the education of the public to the real value of the clay products that we as craftsmen in the production of such products will reap a reward?

I know of no industry of such magnificent importance as our own that has come so far short of making use of all legitimate means in calling attention of the general public to the value of the industry. I believe, as intimated in the opening of this article, that now is the time to make proper use of the Illinois state fair as a proper means of advertising our industry for the double purpose of educating the people and creating a demand for our products. Since the permanent establishment of that fair there has been on exhibit a few samples of clay products, but the display has been so meager that it has not claimed the attention of even our own craft. It occurs to me that preparation should be made at once for a proper display of all clay products at the next annual exhibition, and that that display should include such specimens for exhibit as will not only appeal to the utilitarian classes, but will attract the aesthetic as well. I have sometimes thought that a building of our own in which could be combined every article made from clay in such a way as to best show both the utility and the aesthetic combination would be most attractive, and thereby most far reaching in its effects. It does not occur to me that a building of very large proportions would be required to accomplish the end sought. It certainly should be attractive in its architecture and so arranged and constructed as to make use of the greatest variety of material. As to the cost of such a building, the contribution of the different kinds of material by the different manufacturers, it seems to me, would not be a burden that the manufacturers would be unwilling to bear. The labor required would, of course, have to be borne by the parties making the exhibit. The State Board of Agriculture has given assurance that a building constructed on the plans suggested would be an attraction that would be most acceptable to them. The building would be a permanent educator and advertisement. New material and new methods could be put on exhibition upon tables or shelves in the interior. Judging from the action of the state board heretofore there is no doubt but what an exhibit in the form suggested would result in some financial aid being given by the agricultural board.

PROJECT FOR A STATE EXHIBIT OF CLAY PRODUCTS.

President Townsend: There is a great deal of truth in that paper, and I believe, before we drop the subject, something should be done to get this work started right, so that by to-morrow we can go home with the assurance that something definite has been accomplished in regard to this building. I would like to ask Mr. Converse if he has any ideas to offer in regard to the structure that he has in mind. If he can give us something of this sort we will have something to work on.

Dr. Converse: I really have no plan to submit. Last September I met Mr. Townsend, and we were both anxious to have an exhibit by the Association. We had our pavilion that we used at the World's Fair, and Mr. Townsend and I went to take care of the exhibit, and when we got there we found but little to make a show of except ourselves, and, as we were not very attractive, not very many people flocked our way. The exhibit was very meager, and there was not enough there to claim any special attention. We had more room than we required, and I suggested to Mr. Townsend that it would be a good plan to have a building of our own; we would certainly have something attractive; then I made the suggestion that that building be of our own products. I thought we could commence with the

E. M. PIKE, Chenoa, Ill.

foundation of hollow block and have the wall of brick, and then put a roof on it of tile, and so give the people something of an idea of what could be done with clay in building structures for the habitation of man. Then it could be decorated on the inside with our work; we should also use tile to decorate the walls. It seems to me we could make that sort of a structure very neat. It would be most attractive and would be a source of much interest, and at the same time attract the eye to the use of our ware. Now, that is just about the idea that I have tried to bring out in that paper. Just how to go about it I do not know. Some of you who have been thinking about it can give us something of value. It seems to me it ought not to be very expensive. I think we could get all the material contributed. I think those engaged in the manufacture of roofing tile and other products would be glad to contribute. The State Board of Agriculture, to whose attention the matter has been brought, would be very much pleased to have something of this sort. Perhaps some of you have some idea how we can formulate plans by which the material can be gathered and some arrangement can be made for a suitable building. It need not be a large one, and still we could make a very pretty building that will hold all our exhibits. The more I think of this idea the more it has grown upon me. I do not know what else we could do to attract the people to the ware we are making.

Secretary Stoll: We have been trying to hold an exhibit of the clay products of the State for two or three years, and we had our pavilion, of which Mr. Converse has spoken, moved to Springfield two years ago, and last year, in about August or July, I got out a little circular letter and sent out to all the clayworkers in the State, telling them we wanted to make an exhibit at Springfield—one that would be attractive and result to the advantage of the clayworkers generally. I sent out 150 of these letters, with self-addressed tags to President Townsend, at Springfield. I thought that out of 150 we would probably have fifty exhibits, and I think we got four or five. I wrote to the secretary of the State Board of Agriculture concerning the matter, and asked, if we sent the material down there, if they would furnish the ground to put it on. He said they would be very glad to help us out. I have been talking to several gentlemen about this matter, among them Mr. Gates, of Chicago, and I cannot think of any way of making a building attractive unless we would build the foundation of hollow block from one man's factory, and then lay two or three courses of brick of one man's make, and then three or four courses of another, and if we have every two or three courses different we would not have a very nice looking building. I would like to hear what Mr. Skeele has to say on this subject.

Mr. Skeele: I have not given this matter any thought. However, I should regard it as a very desirable move. I should think the State Board would be very glad to erect the building if we furnish the material.

Secretary Stoll: They agreed to give us $50, and I expect they would be willing to do more for us after we got the plan under way.

Mr. Skeele: It would be a feasible plan, I think, if we furnish the material for them to put it up, and we could have a plan drawn to accommodate ourselves and our exhibit if we want to make one in the building; we certainly want to make it worth something to exhibitors. We can let out the space at so much per foot, and those who have furnished the material can have the first choice of space. I should think a committee might readily be appointed to take this matter in charge, and I think it both desirable and feasible.

Mr. Hess: I think the suggestion a very wise one, and that a large number of the clayworkers of the State will be willing to join in the movement. Possibly a good idea would be to have a committee to look after the matter, and, after we once found out what could be done in Springfield, then the clayworkers could submit samples and state how much he would contribute to the committee, and the committee could have an architect look over the plans and the material, and the architect could then advise them as to what material is wanted. The architect might want to use more of one material and less of another, and the manufacturer could know in that way how much he could furnish.

Mr. Plumb: I do not suppose that the object of the State fair is a selfish one, and yet, on a proper plan, I do not ob-

ject to selfishness. The exhibitors go there and furnish articles to let the public know what they have got, and expect to reap a benefit. The State fair is largely a large advertising scheme for the people that are represented there, and if a manufacturer is willing to contribute a wagon load of brick or roofing tile or hollow block, he will want it known whose material is put into the building. Mr. Skeele, for instance, contributes the roof; he will want it to be known, and so we will all want the public to know where these articles can be obtained, and it is not a selfish idea, either. Now, you talk about the clayworkers of the State. There are three hundred tilemakers and a thousand brickmakers, every one of whom would be very glad to contribute something to this building, and yet they would want it known whose material goes into the building. Now, personally, I would be glad to have such a building, that the public might know what Illinois can produce in the way of building material. I think it a good idea; but if we are going to send our products down there, we want to have something nice. Right here in Ottawa we can find the hollow-block ware; in Springfield or Galesburg we can get paving brick for our walks, and I say the problem will be to give every one credit. If built out of material taken from all over the State it would be a mistake. It would take the genius of the greatest architect we have in our State to take the multitude of materials sent in and work it into acceptable shape and make a handsome building out of it. The scheme would be a difficult one if you undertake to satisfy all of them; and yet, if we can work out the plan so that we can have a permanent exhibit, so that each clayworker can take certain space in this building and make his display artistic, it will be a very desirable thing, and one that I would like to see carried out to a successful finish.

Mr. Pike: Mr. Chairman, I do not know that I have anything to say. It seems to me that in the construction of a building of this sort we should make it as artistic as possible. If we are going to have a building to show off our clay products of the State of Illinois we want a handsome one, and we will want it to be a permanent one, and if we go to using material from all over the State we will have one course of brick here of one color and another course there of another color, and above it we will have a course of mottled brick, and here a red and there a buff, and we would have a building that would look like a regular Dolly Varden. (Laughter.) Of course, when we do that in the construction of this building we will lose the very object we were after. We would want this building symmetrical, handsome and attractive to the eye, as well as being durable. It seems to me we cannot go into it so extensively as to take all the products. Another thought that Brother Plumb has advanced is that we should have a building that we could hand down to posterity, and we cannot follow a Dolly Varden feature. I do not know that I have made myself plain, for the question is a hard one to get at; but if we build this structure, we will want to build it so that the public can see how a building can be made beautiful and artistic and durable, and yet be all built from the products of clay.

President Townsend: I do not believe there is a clayworker in the State but would be glad to have this building erected, and I doubt not that if a half dozen members of this Association would take up this matter in earnest we could get it done, if we can find some one who can spare the time that will be needed. Somebody has got to put time and thought into the matter. The Association has not money enough to pay for any one's time. I expect that if a committee were appointed this afternoon to go ahead and formulate plans they would find later that they could not attend to it, and that at our next meeting they would come up and ask for more time.

Mr. Plumb: The point the Secretary has brought out is whether we deserve anything of the sort. He sent out 150 letters of invitation, with the assurance that the exhibit would be well cared for if sent to Springfield. He expected fifty replies at least, and yet less than a half dozen responded, and I do not know if we deserve anything of that sort. Perhaps he had better try us again, and if he does not get more than a half dozen responses it will be a pretty good indication that we are not very anxious for a permanent exhibit.

Mr. Randall: I am an outsider, and

W. A. EUDALY, Cincinnati, Ohio.

have no direct interest in this, yet I will be very glad to see the Illinois people start and carry to a successful finish such an enterprise, because it would afford me an excuse to come over and visit you. As Mr. Pike has said, it ought to be done, but the question is, How ought you to do it? I think the very fact that so few replied to the Secretary is because there was an indefiniteness to his plans. So many questions come up in these matters that need to be settled before you can have the entire confidence of the people. In matters of this kind you must have some well-defined plans to submit, so they can see what you propose to do. Now, I believe this can be done. Mr. Skeele says he is interested and would be very glad to see it carried to a successful issue. He informs me that he has an architect in his employ who can prepare plans for such a building, and that he will do so cheerfully. If this is done and something tangible is presented to the clayworkers of Illinois, I believe they will respond promptly and satisfactorily. First determine the character of the building that you want to erect, then submit your plans, and you can count on ample support. I therefore move, Mr. President, that a committee of five be appointed by the chair to consider and formulate such plans; that the President and Secretary be ex officio members of this committee, and that the Secretary be authorized to expend a sum not to exceed $25 for the preparation and distribution of these plans among the members.

Motion seconded by Mr. Mamer.

Mr. Eudaly: I do not believe it is feasible to build a building such as you contemplate from materials from all over the State. I concur in what Mr. Plumb and Mr. Pike have said. I believe that such a building should be a magnificent affair. I believe that the clayworkers of this State have pride enough to do everything they are called upon to do to build such a building. I do not think, if the manufacturers build such a building, that it will be done from a selfish motive. I believe that the clay manufacturers have just as much State pride as any other manufacturers, and that they will go just as far toward putting up the building as any other manufacturers, and I do not think we should intimate that the clay manufacturers will not take a hand in any public manner until they can see their dollars coming directly back to them. I believe that if this committee which is to be appointed will select some plan regardless of the material—that is, where the material is to come from—to make a beautiful building, it will make no difference whether it comes from one manufacturer or from a dozen, just so it is put together in a manner to make a beautiful building, a building that will be a model in claywork, and get the very best material in the State with which to build it. Don't put up a building from stuff here, there and everywhere, and try to get every man's material into it, but make a grand building, a beautiful building, out of the very best that the State can offer, and then get the very best architect to put that best material together in such a way as to make a building, and not let it be understood that the material of which the structure is built is made by this manufacturer or that or any other, but let the space in such a building be taken by the different manufacturers, where they can show what they are capable of doing. In other words, let every exhibitor who is willing to pay for it have an exhibit to suit himself. Let your building be one that will be a credit to you. Now, how will you get the means to put up such a building? Don't the State Board owe the clay industry as much as any other industry in the State? This is one of the great States in the Union so far as your clay industries are concerned. I understand that you rank fourth according to your last statistics. Well, I say to you that to rank fourth in any industry in these United States is no mean thing. It is a thing to be proud of, and I know the clayworkers of this great State will not hesitate to contribute a few dollars for this enterprise, regardless of seeing them come back. Now, if the State Board is not willing to build this entire structure, can you not sell space enough to pay for it? If you can't do that, you can depend on the clayworkers of this State to furnish enough money to finish it. It makes no difference whether you get out of the building what you put in or not.

Dr. Converse: As Mr. Pike suggests, we do not want a Dolly Varden exhibit.

It should be practical; it should be built not only with the idea of beauty, but of utility, and that would be a benefit to each and every one of us engaged in the clay industry. In this way we can open the eyes of the people so that they may see what can be done with clay. It is not a makeshift; it is not to take the place of something because it is cheap, but because it is to be permanent. I will give you an illustration. A gentleman came to my office six months or so ago and said: "I see that there are some large blocks out there at the plant, and I want something about 4 by 8 by 16 inches. What will you sell them for?" I said, "What do you want them for? You can go out and pick out just what you want, and you shall have them." But he said, "How much will they cost?" I said, "I will send them down, and they won't cost you anything." And he took those blocks and built a beautiful mantel for a lady in Springfield, and now about a dozen or fifteen ladies in our city have gone crazy over that mantel. I think they will get over it, but they think they have got to have that mantel. There was nothing particularly peculiar about the blocks we put in the mantel. I presume they could be made on any stiff-mud machine in Illinois; but what I want to say is that the people should be educated to the utility of this material. That is one of the objects of our exhibit at the State fair. There will be an increased demand for our material that will benefit us, and will benefit the people more. One of the greatest arguments that we can use for our material is its durability. It is a waste of money to put down wooden sidewalks. Now we are using shingle roofs all over this country. There is no reason why we should not use roofing tile, but we are using shingles, and in six or eight years they are gone; we want the people to know that there is a stability about us and our products. Mr. Eudaly has brought out an idea that is correct, and that is what our State deserves to have. Possibly if we present this matter to the State Board in the right light they will put up such a building as we should have to show what can be done with our material. There is no more reason why they should not do that than that they should help every other industry. They help the live stock, the agriculture and the dairy interests, and I am sure that if we present plans, properly drawn up, they will help us. We cannot ask for an appropriation until we have something tangible to show, and I think it a good idea that we have suitable plans drawn up that we can present with a bill to our State Legislature in such a way that they will grant what we ask for.

The motion of Mr. Randall was then put by the chair and duly carried by a rising vote.

—Grate Bars or No Grate Bars.—

Secretary Stoll: The next of the programme was to have been a discussion on grates, to be led by Mr. W. S. Purington. The secretary has been around the country a great deal the last year, and has often asked, which is the best way to burn, with or without grate bars? I have replied that if they would come to this Convention this question would be brought up. Mr. Purington writes that he is very sorry that he is not able to be with us, owing to the fact that he is very busy. They are changing their kilns, so as to use the waste heat from cooling kilns for drying purposes, but I think we have a number of gentlemen here who are experienced along this line. I will ask Mr. Thomas Trainor to give us his ideas in regard to this matter.

Mr. Trainor: I have used coal very little, so I cannot discuss the question. However, I would rather burn without grates.

Mr. Plumb: We have been working with this question at our plant. We have two plans of burning coal, one with grates and the other without. The plan of burning without grates has some difficulties in that it clinkers, and it is hard on the men. That is, the way we have it fixed, which is, I suppose, the ordinary plan of putting the coal into the hopper above and taking out the clinkers below. The slanting grate bar which we use is easy to handle, easy to clinker, and these conditions seem favorable, but we find that we are consuming a little more fuel each burn with the slanting grate bars. Why that should be so is more than I can tell, unless when we fire up and open the doors it lets in the

JOHN MORONEY, Chicago, Ill.

cold air, and we hinder the burning and lose heat in that way. The men who do the burning say, "Give us grate bars, slanting grate bars." The men like the grate bars. The men who pay for the fuel like the other plan. That has been our experience. It has been rather limited. There are other people here who have been using grate bars, and I would like to hear from them.

Mr. Solfisburg: We burn without grate bars. I have always thought it averaged up on coal. It is hard on the grates, harder to keep clean. We use the dead bottom.

Mr. Skinner: We have burned both with and without grates. If you have an experienced burner, one who is wide awake, and does not go to sleep, he will keep the fires up all right, and keep the cold air out, but if you have an inexperienced man you will find him a little tardy in attending to the fires, and you will find the dead bottom is the best. You get the bottom flat and narrow and keep the air out. You can make the fire hotter without grate bars than with them. I know this is a warm question to talk about in this Convention. Without the grates you do not have as large a per cent. of cracked brick, and I think the reason is if the fires get a little low it holds the heat and keeps the cold air from getting into the kiln. It is much easier to fire a dead bottom without grates than with them. I remember the first kiln we started at Varna. The grate bars were about 4 feet long, 15 inches wide and 18 or 20 high. We nearly had to carry a shield with us to keep from roasting when we were burning that kiln. Where you have to change men sometimes, and where you get inexperienced men who do not attend strictly to business, there is less waste with the dead bottom.

Mr. C. C. Barr: I do not know that I can say much to interest the members. We originally had grate bars in all our kilns. We have none now. Our experience is that we get better results without them. Whether we should or not I do not know, but we do.

Mr. Pratt: I would like to ask the gentleman if, when using a dead bottom pocket, they realize any difference in time in generating a certain heat?

Mr. Barr: We have both round and square kilns. We have 50-foot stacks, plenty of draft, and we can acquire heat just as quickly without as with them. In some kilns we have short stacks, and we cannot get the heat as quick. It will take one or two days longer to burn the kiln without than with them. Where we have plenty of stack we can burn just as quick without them.

Dr. Converse: We took the grate bars out of our kilns and burned two or three kilns without the grates, and it was not satisfactory with us. We believe it would be better if we had taller chimneys. We use the Eudaly kilns. We put our bars back two or three years ago, and have made no change since.

J. M. Mamer: I believe it depends entirely on the coal a man uses. If he uses a coal that will run or clinker I do not think a grate bar is the right thing to use. If he has a coal that burns fairly well without clinkers it will be all right. We have never used grate bars. We have got good results without. I think there are a great many of the members here who visited the Purington Paving Brick Co. when the Convention met there. They were changing their pockets and burning without grate bars. Of course, they were changing from oil to coal, and they tried burning without grate bars, and Mr. Purington said they got heat into the top courses in the kiln, and practically got their very best ware from the top, while in burning with grate bars they were nearly always more or less checked. I think a man must know the character of coal he is using.

Mr. Pratt: I would like to ask another question in regard to water smoking—whether they notice any difference in the length of time?

Secretary Stoll: For two years and three months I was superintendent of the Grant Park Brick and Tile Works. They had two kilns with grates and one without. The two with grates were 18 feet in diameter, and the one without grates was 22 feet. The coal we used came from near Danville, and we had to throw it down on the ground, where it got mixed with the sand and dirt. We had a great deal of trouble in using grates. When the fires got real hot this stuff would melt and run, and we could scracely do anything with it. The coal, of course, was bad, and it took us so long to clinker it and get the mass loose from the bars that we would let the cold air in, and so we cooled our

boxes, and it would take us two to two and one-half hours to get our heat back where it was when we started. I do not think it water smoked as well as the kiln that did not have the grate bars. We would not wait until there was a great mass of clinkers in the grate, but we had a long bar that we used, and we would keep them loosened up. We had no trouble whatever in burning without the grate bars, but we had a whole lot of trouble with the grate bars, and I could burn the 22-foot kiln ten or twelve hours quicker than could the 18-foot kiln. I could water smoke one just as quickly as I could the other. We had a 50-foot stack. I cannot tell how often we fired. If the wind came from the north that side of the kiln needed firing more frequently. It took sixty hours to burn the big kiln, and fifty hours with the little. We had to clinker about every two or three hours. Our heat would go back, and it would take us nearly two hours to bring it back to where it was at first.

Mr. Cunningham: This subject of grate bars is an old one, and I think I can tell why one kiln will clinker and another not. We all know that some coals will clinker much worse than others. I have had a great deal of experience, both in Indiana and Illinois. Take the Danville coal, and it is very bad about clinkering. If you will give it plenty of air space it will burn without clinker. If I were Mr. Moloney I might tell you all about air spaces and the kind of grate bars to use. If you have sufficient grate bar surface, you can burn your coal properly. My experience has been not so much with kilns as with boilers, and you know we burn all kinds of coal under boilers.

Mr. Eudaly: Now there are a great many patented grate bars, and a great many that are not patented. Fortunately, or unfortunately, I do not own any of them. I am particularly interested in the discussion of grate bars in every shape and form. It would be worth thousands of dollars to me if I could build kilns without grate bars satisfactorily in all parts of the country. I would like to abandon them. For two or three years I have heard this question discussed. I cannot go before people to whom I want to sell my kilns and advise them to abandon grate bars until I can give good reasons for it. They talk about the economy of burning without grate bars. I wish some one would assure me that there is economy. Perhaps there are places and conditions under which men can get better results without grate bars than with them. I am led to believe this because these gentlemen say so. But it is a very dangerous kind of advice to give. I knew a man once who was burning with a certain kind of fuel, and he talked and wrote about it, but did not say anything that was not correct and proper to say. And I know of a number of people who, without knowing any of the circumstances under which he was using this fuel, without knowing what it cost him, put in similar plants and broke up because of it. This was not because the fuel could not be used in burning brick, but it was because there were certain conditions under which this gentleman burned that did not maintain with the other people. So it is with this question. We must know all of the conditions and circumstances before we can say we can do this or that or the other. A man must take into consideration the entire scope of the thing. I want some one to help me along in this line. These grate bars are expensive, and I would like to do away with them.

Mr. Pike: Those who burn without grate bars have to have a greater draft than those who burn with bars, for the reason that when you get a draft in the kiln, and the grate bars are there, you put in more air than you do heat, on account of having a good draft. It takes a stronger draft to burn without grates than it does with grates and get good results.

Mr. Barr: That has not been my experience. My experience has been with a dead bottom pocket. I was burning a round down-draft kiln with a group of stacks on the side of the kiln. I used the grate bars, and, as our friend Skinner here said, we had to use a shield. (These were slanting grates.) I felt there was more heat going on the outside than on the inside of the kiln. This was a kiln 22 feet in diameter on the inside, and, as a usual thing, we burned 40,000 brick in this kiln, and last year we used to use between twenty and

THOS. TRAINOR, Cayuga, Ind.

twenty-two tons of coal, and I got to considering the matter and changed a pocket or two, and it seemed to give out so little heat on the outside and burn up so well that I changed the kiln this year to solid furnace bottom without grate bars, and I have reduced the expense of burning considerably. Using the same coal, we now use between fifteen and seventeen tons where before we burned twenty-two.

Mr. Pike: That is another condition. In that case you had a stronger draft. With most kilns the greater and larger opening of the stack the greater the draft. If you have grates with a strong draft you cannot do as well as if you had it without grates.

Mr. Eudaly: I have written a great deal on the subject of draft, and I am just foolish enough to believe that if there is anything that I do know something about it is draft, and if I fail on that I should think I did not know very much. It is not always a question of small stack or tall stack to create draft. That is not the thing that makes the draft. It is the weight of the column of air in the stack as compared to the column out of the stack. A column 25 feet high should be heated to 25 degrees at the top (the weight is measured by the temperature at the top; it makes no difference how high the stack is). If the air at the top is 500 or 2,000 degrees, it is much lighter than the outside air at 60 or 70 degrees. Consequently, your draft is accelerated to that extent. If you have a very tall stack and you maintain at the top of that stack the same degree of heat that you had in a very low stack, you will have a greater draft, but you very well understand that it takes a greater amount of fuel to maintain the temperature at the top of the tall stack than it does at the top of the small stack. That is all there is in it. You can get all the draft you want with a tall stack if you are willing to put the fuel into it. You must heat tall stacks. A stack with the temperature on the inside the same as the temperature on the outside, with a quiet wind, will have no draft.

Mr. Mamer: I do not agree with you.

Mr. Eudaly: That does not make any difference. (Laughter.)

Mr. Mamer: Why is it, then, if you take a stack early in the spring of the year, when there has been no heat in it all winter, and you put a piece of paper in at the bottom, the draft in the stack will carry the paper out at the top?

Mr. Eudaly: If you will take the temperature near the top of the stack you will find it is several degrees warmer than it is on the outside. I want to make another statement or two. Draft depends upon another thing. The size of your flue and the size of your stack must vary in proportion to the amount of fuel you are going to burn in your fire box or grates. If you by chance get the right proportion and you think you are doing fine, the nearer you get to the right proportion, based upon an average amount of fuel, the nearer you will have the right kind of draft. I believe you all believe this. It is simply a problem of mathematics. If you are running some sort of a plant where you keep your fires just the same week in and week out, you could figure this thing down to a nicety. With brick we begin with a light fire, and then we have a high fire, so that at the finish the fire is not the same. You should strike an average in the building of your flues and stack so as to meet an average temperature and an average daily amount of fuel used, so as to make your kilns work properly. We should take these things into consideration. One man gets up and says I tried this thing or that thing, and it worked all right. Well, he, by chance, got his proportions right. Another man says it won't work; well, this man did not get his proportions right. There is no question that comes as close to the hearts of all clayworkers as the question of burning, and I hope some time some brother will invent a perfect kiln, and will be able to tell why it is better than some other. There is a wide field here for discovery.

Mr. Pratt: I would like to ask Mr. Eudaly, if he were going to get a strong draft, whether he would increase the area of his flue, or raise the height of his chimney.

Mr. Eudaly: I am very glad you asked that question. Strong draft and quantity of draft are entirely different.

It must depend upon the size of your kiln and the amount of fuel you are going to use per hour.

Mr. Pratt: Do you say that a stack 25 feet high will draw as strong as one 50 feet high?

Mr. Eudaly: No, sir. I said that the draft in a stack was measured by the temperature at the top of the stack. Now a stack 100 feet high, with a temperature at 500 degrees, will have a great deal more draft than one 50 feet high with the temperature at the top the same. It takes more fuel to maintain the temperature in a stack 100 feet high at 500 degrees than it does in a stack 50 feet high. Therefore, there is a limit beyond which you may not go with a tall stack, because you will use so much fuel. For that reason I have always maintained that low stacks are better, for you can get a greater amount of draft with the same amount of fuel.

Mr. Skeele: It is interesting to observe—I will not undertake to state the reasons—but it is interesting to observe that the Germans, who are very careful manufacturers, invariably have high stacks. They can tell you why this is so. You go through Germany, and all the clay works have stacks 250 feet high, and they are not putting all that money in stacks for nothing. I have entire confidence in their judgment and experience and economy, and unless high stacks were not valuable they would not use them.

Mr. Cunningham: The reason why a stack draws is simply because the temperature at the top of the stack is different from what the temperature is at the bottom. The higher you go the colder the air. That creates a vacuum; the warm air passing up the stack causes the air to rush in and creates a current. Now the gentleman asks whether if you make the stack larger or taller if it will make a difference. If he will make his stack larger and allow the height to remain the same, and allow the grate bars to remain the same, he will get the same result as though he left the stack the same size and made it taller.

Mr. Eudaly: I have prepared a table on this question, which I expect most of you have seen, but I will read it:

Table showing the Theoretical Draft Power in cubic feet of air and pounds of fuel possible to be burned by chimneys of different heights, with a cross-sectional area at the top of 144 square inches, mean internal temperature 550 degrees, external air at a temperature of 62 degrees.

Different heights of chimneys.	Velocity of cold air, in feet per second, entering the furnace.	Velocity of hot air, in feet per second, leaving the chimney top.	Cubic feet of cold air entering the furnace per hour at 62 degrees.	Cubic feet of hot air leaving the chimney per hour at 550 degrees.	Pounds of coal burned per hour.	Pounds of hard maple wood burned per hour.
25	28.3	56.6	101,880	203,760	346	782
40	35.7	71.4	128,520	257,040	437	996
60	43.8	87.6	157,680	315,360	536	1,222
80	50.6	101.2	182,160	364,320	619	1,412
100	56.5	113.0	203,400	406,800	691	1,576

A comparison of the theoretical power of short stacks, at high temperature, within the kiln wall, with tall stacks, at low temperature, outside the kiln wall.

Different heights of stacks.	Different temperature of stacks.	Velocity of cold air, in feet per second, entering the furnace at 62 degrees.	Velocity of hot air, in feet per second, leaving the stack.	Cubic feet of cold air entering the furnace per hour at 62 degrees.	Cubic feet of hot air leaving the stack per hour.	Pounds of coal burned per hour.	Pounds of hard maple wood burned per hour.
25	1600	34.64	138.56	124,704	498,816	424	986
80	325	41.35	62.03	148,860	223,290	507	1,153
100	230	40.00	52.33	144,000	192,000	403	1,116

Mr. Mamer: There is a table prepared by the Wilcox & Babcock Boiler Co. that does not agree with your figures. According to their table, the best results are obtained from a stack about 300 feet high.

Mr. Eudaly: I was not giving you the best results at all. I was giving you the results from stacks of different heights with the same amount of fuel. I was giving you the same conditions as to temperature in different stacks.

T. P. Plumridge, St. Louis, Mo.

Mr. Plumb: I can bring this discussion to a close by stating a fact. (Laughter.) In our town, at the glass works, not long ago, a stack was built about 60 feet high and would not do the work. No changes were made except to increase the stack about 30 feet, and it did the work.

President Townsend: I do not know whether this question is settled or not, but we will have to take it up some other time. The secretary will read the next on the programme.

Secretary Stoll: Mr. Plumridge has been unable to get here but has prepared the following paper.

LESSONS OF HARD TIMES.

By T. P. Plumridge.

As this subject was assigned to me by our worthy Secretary, and as he did not give me time to accept or decline it, I presume I must constitute myself a mind-reader and endeavor, as far as possible, to enter his life and thoughts and portray under his mental control what he would have said had he had the time to prepare a paper on this subject. You will consider, therefore, that he is doing the talking. As for me, I would rather have had something pleasant assigned me, such as, "How Do You Feel When You Have to Pay an Exhorbitant Doctor's Bill After You Have Entirely Recovered?" or "What Pleasant Sensations Are Associated with the Information That You Have Had a Fire and Your Insurance Expired the Day Before?" The fact is, I think "I know when I get enough," especially of some things, and I have lived, dreamed and slept through the hard times, heard that the trouble was occasioned by being burdened with a cross of gold on one shoulder and carrying too much silver on the other; that I was trodden upon by the Republican elephant, and being kicked to death by the Democratic jackass, and now I haven't hardly got my breath until my sleep is disturbed by dreams of a trust octopus, that stretches its multiple arms over and around me, takes the bread I have prepared for my wife and little ones, and nothing is left me but—"water." Water that comes down past your beautiful little city, which is now and soon will be further diluted with the clear water of Lake Michigan, as it gently ripples past the many manufacturing industries along the south branch of the Chicago river, murmuring sweet cadences of love, life and joy, as it strikes the impeding piers of Chicago bridges, flowing past the beautiful stockyards and gathering odors which scent the country for miles around, and even reaches St. Louis, where I am privileged to pay for it and drink it—unfiltered.

This is what is left when the pessimist gets through, but the Secretary is not a pessimist. He has learned that 100 cents make a dollar, and 42 cents won't do it. The hard times have taught him that economy is the source of wealth, and not only the source, but the fountain spring. That it is better for him to run on with the old brick machine than to run in debt for a new one. To run it for all it is worth, to bring up his capacity to such an extent that when the octopus does come along he can get out at a good price and back his son or his neighbor's son and start a better yard for half the money.

These are some of the lessons he has been forced to consider, but looking backward now will not be of as much service to us as it will be a few years hence. The mistakes of the recent past are too vividly portrayed on memory's tablet; they are intensified by hardships which we have undergone, and which we think will never be effaced. But time as well as death effaces distinctions. History repeats itself. The good times are upon us, fair seas are before us, and we will sail on through brighter skies and the storms will be forgotten. To have learned our lessons properly is not to forget the storm, but to construct our craft for the severest gales. Storms will arise, and we will again be called to face them. Would it not be as well to pause now, and, when the inclination comes to increase your capacity on account of the demand for your product, to consider that the time will come again when you will wish you had taken your surplus and invested it in some other direction or laid it by to draw upon when the supply again exceeds the demand. I do not think that this fact can be better illustrated than by giving you a synopsis of a conversation I had with a buyer for a large Eastern jobbing house. His specialty was lace curtains. A certain

grade was made by a manufacturer in a little town in Germany. He went to Europe, as was his yearly custom, to purchase for his house, and called on the German, offering to take his entire output at an advanced price. The manufacturer refused. The refusal caused some astonishment in the mind of the American buyer, and he was unable to account for it by any process of reasoning acquired in his school of trade or experience. When plying the German with questions, among them, why he did not increase his capacity, he was met with the argument that he had an established trade; that he had built it up on the quality of his goods. If he sold his output to America this year he would lose the trade which had taken him a goodly portion of his life to acquire. Next year America might not want his goods, either through dull times or other causes, and if he increased his capacity to meet the trade of both sections he would be left with a large factory on his hands and not enough demand to take his entire output. This would cause him to either run on half time or sell at a loss. He preferred to keep along the even tenor of his way, and have a good demand for his product at a fair price rather than to run the chances which he enumerated. Was he right or wrong?

The lessons we learn, therefore, are these: Make good goods. Establish a trade by close attention to your business which will stick to you in hard times if you stick to it when times are prosperous. Don't increase your output to such an extent that when the demand slacks off you will be compelled to sacrifice in order to meet your competitors who are sailing close to the wind. Do not go into debt to build a bigger plant than your neighbor. Fraternize with the trade, attend your State Conventions, and when the National Convention meets go and hear what the other fellows are doing on the other side of the lakes, rivers and mountains.

Secretary Stoll: The next is a paper, "From Clay Bank to Kiln," by R. Thomas, Roselle, Ill. Mr. Thomas is here in the city, but he had some business to attend to, and asked me to read his paper for him.

FROM CLAY BANK TO KILN.

A. Thomas, Roselle, Ill.

Mr. President, Members of Illinois Brick Makers' Association—Your worthy secretary, G. C. Stoll, requested the writer to prepare a paper entitled, "From Clay Bank to Kiln," to be read before the session now convened, which subject is very easily mentioned, but in reality covers a large proportion of the ground in the manufacture of brick. It is also a question which is occupying some of the best minds engaged in the trade to-day. But for the necessity of considering these weighty questions the present association would not have been called into existence, and doubtless there are members present who have clay banks which will require a lifetime to solve the best possible method of manipulating the same so as to obtain the best results. As the majority of plants in this State are of common brick, that department only will be considered in the present paper.

The quality of the clay is one of the most essential points to be determined upon, and the next is to ascertain the depth of your clay and also to find whether the clay is the same from top to bottom. If this is the case it can be handled to good advantage, but if you have two or three different strata of clay then it is a more complicated matter to insure a uniform mixture of the different kinds. Where the clay is lifted with a steam shovel the various kinds can be mixed to good advantage easily, but where the pick and shovel is used the safer way is to bench off the clay bank, assigning one or more men to each bench, according to the proportions desired. The writer's experience has proved that almost invariably much better results are obtained by a mixture than where each strata is used alone. A little careful supervision in the clay bank will undoubtedly be the means of producing superior results, not only in the making, but also in the burning of the brick.

Where the crusher or disintegrator is used it is desirable to reduce the clay to as fine particles as possible before going into the pug mill in order to obtain a homogeneous bond in the brick. The writer's experience in working a number of clays throughout the State has proved that it is not only necessary that the clay be well pugged, but that it is practical that it be well packed before reaching the machine. In order to obtain this necessary packing it is advisable that the clay be put

A. Thomas, Roselle, Ill.

through a second pug mill which should have a closed top. There are common brick plants running to-day with a large output and making money, but they sustain a heavy loss on each day's work in broken and cracked brick. This is frequently attributed to the weight which the green brick sustains on the drying cars or to some fault in the process of drying. It is the writer's conviction that this could be obviated by the packing of the clay in the second pug mill, for where the clay passes through only an eight-foot pug mill the time is too short for the proper packing of the clay where there is an output of 75,000 or 100,000 brick per day. This packing will produce a better appearing brick and one which will stand handling with much less injury, and will also reduce the lamination. Failure to have the clay reduced fine enough and well packed is one cause of the large percentage of bats. If there was as much care exercised in manipulating the raw material to properly prepare it for the machine as there is to look up all the latest points of improvement in machines there would be far less fault with all machinery and there would be a superior brick made, with an increased output. The manufacturers of brick machines are somewhat in advance of many of the men in charge of brick plants. The machine builders, being good mechanics, have centered their energies upon perfecting the machinery, while it has devolved upon the brick makers to solve the several problems of how to obtain the best product and large output. Practical experience is the chief factor in this case.

Having prepared the clay for the machine, we will now consider some important points at this stage of the manufacture. It is essential that the man who has charge of the machine should thoroughly understand how to keep in good repair and be competent to discover just where the trouble is when the ware is turned out imperfect. He should be a man possessing a certain quantity of snap judgment, and also one who is thinking more of the best interests of his employers than how near it is to quitting time. It has frequently been the writer's experience that superintendents appeared to think that all which was necessary was to have a man with the requisite muscle to start and stop the machine, and if the result was not satisfactory the machine was condemned, whereas had a man who put a little more thought into his work had charge of the same the trouble could have been avoided. On a common brick plant where the quantity more than the quality is the point to be kept in view there may be two or three men who can produce about the same average for a day's run. If there is one whose judgment is superior as to quality of brick made it is desirable to keep him at the machine, for there is no doubt a well-made green brick is preferable to a poor one, for an imperfect green brick cannot become a good brick, even though it be well burned. The man who has charge of the machine should be competent to judge whether the bar of clay is too dry, for great pressure upon such a bar will lessen the adhesiveness and cause lamination. This process of pressing all the particles together, with a uniform moisture, before subjecting the clay to the pressure of the machine is equally essential for shale brick. If the supply of brick to-day came only from those who make and burn best the demand would far exceed the supply.

In compliance with the secretary's request for a short paper, I will leave the subject here, as to attempt to comment on drying and burning would be a lengthy matter, wishing that all interested in the manufacture of brick may be successful in carrying their product from clay bank to kiln. Experience is a great teacher, but it is a difficult matter to commit its teachings to paper.

President Townsend: If there is no further discussion a motion to adjourn is in order. I want to again mention the fact that the banquet will be held tonight at 10 o'clock. The Business Men's Club will be open to our members, and there will be a very good opera company in town this evening, so I guess the members will have no difficulty in passing away the time until the banquet hour arrives.

On motion, the Convention adjourned to meet Wednesday morning at 9:30.

THIRD SESSION.

Wednesday morning, Jan. 10.

President Townsend: The Convention will come to order. I guess, gentlemen, we are all glad to be here. I know I am. In accordance with the motion made yesterday, I will appoint the committee to look after the building at the State fair grounds. In addition to those I name, the committee will include the president and secretary of the Association as members ex officio. I will appoint:

H. B. Skeele, Chicago Heights, Ill.
A. L. Converse, Springfield.
W. H. Hurlburt, Macomb.
E. M. Heafer, Bloomington.
Lincoln Solfisburg, Aurora.

I would like to have Mr. Pike take the chair for a time.

Secretary Stoll: The first paper on the programme this morning is a paper on "The Future Tile Business," by J. M. Mamer, Campus, Ill.

THE FUTURE TILE BUSINESS.

By J. M. Mamer.

There is nothing more uncertain than dealing with futures. We generally expect much and often get but little, so in calculating the future of any business it is necessary to take into careful consideration its history of the past, together with some of its possibilities for the future, and thus arrive at some approximate conclusion.

The drain tile business has been largely overdone in some localities the past eight or ten years, causing serious competition and occasionally forcing some of the financially weaker manufacturers out of the business. While this modus operandi has caused a loss to a few individuals, yet it has placed the business on a more substantial basis for the future.

In comparing the statistics of the clay-working industries of the United States for the last five years, we find that the production has increased from $64,655,385, in 1894, to $71,597,380, in 1898, while the production of drain tile has decreased from $5,803,168, in 1894, to $3,026,213, in 1898, or from 8.99 per cent. to 4.23 per cent. of the total. In this State (Illinois) the showing is a little better. In 1894 $1,418,572 worth of drain tile were made, while in 1898 the production had fallen to $797,600, a decrease of 43.63 per cent., while the decrease for the United States was 47.85 per cent., a difference of 4.22 in favor of Illinois.

These figures certainly do not look encouraging for the future tile business, because if the decrease continued at this rate the tile business would be practically extinct by 1905. But as there is a cause for every effect, I believe that the principal causes for this decrease was: First, the continued low price for grain during the years following the panic of 1893; and, second, the dry seasons of '94, '95 and '96, which induced a good many would-be wise men to blame tile drainage for the dry seasons, one even going so far as to blame the tilemakers for the low price of corn. Summing up these causes, is it any wonder that the production of drain tile has fallen off? Let us probe statistics a little further and see what they prove.

As we have government reports only since 1894, we must make the best possible use of them. We find that the year 1896 reached the bottom in tile production. Since then there has been an increase of $412,700. Illinois shows up well in this revival, its increase being $279,913 since 1896, or 67.8 per cent. of the total. The total increase over 1896 was only $9,692, while that of Illinois was $14,309, showing that outside of this State there was a decrease of $4.617 from 1896 to 1897. The total increase during 1898 was $402,900, while in Illinois alone it was $265,600 over the production of 1897. Thus we see that during 1898 there was a marked advance, and I feel satisfied that when the reports for 1899 are made up the advance over 1898 will be even more marked than 1898 was over 1897. The large stocks which were piled up during 1894 and 1895 were pretty well cleaned up during the summer of 1898, so that most of the tilemakers were busy during the past season, and I think we all feel that we have shared in the general prosperity of the country.

The prices of farm products have been so low during the last five or six years that the average farmer has not felt inclined to do more tiling than was absolutely necessary, yet I believe that there is not 20 per cent. of the agricultural land in Illinois to-day which is thoroughly and systematically tile drained, while there is probably as much which has little or no tile drainage at all.

Thus it is fair to suppose that the future tile business will remain at par for some years to come. There will probably be no more booms as there were in years past,

J. M. Mamer, Campus, Ill.

but there still remains a great deal to be done. A number of manufacturers who went into the business during the boom years are gradually dropping out and taking up the manufacture of other clay products or quitting altogether. In the case of our own plant the production of drain tile has remained about the same, while our brick business has increased more than four fold since our initiation six years ago, during which time two of our neighbors' yards have been closed and are now being torn down.

The government reports of 1894 show 697 active firms reporting from Illinois, and only 566 in 1896, a decrease of 131. In 1898 the number of active firms reporting was 616, but it is doubtful if in this increase of 50 plants there were five manufacturing drain tile. So it seems that the future tile business in Illinois has fair prospects, and will continue until every acre is thoroughly and systematically tiled, increasing its productiveness and thus retain for old Illinois the renown of "The Garden Spot of the Mississippi Valley."

Chairman Pike: Before we take up the discussion of this paper, I will ask that our vice president, Mr. C. C. Barr, take the chair. He is present, and I think he should earn his honors.

Vice President Barr: Gentlemen, the paper is now open for discussion.

Mr. Plumb: I am interested in a plant that alternates between brick and tile. My impressions are that the depression that seems to have overtaken the tile business in the last six or eight years, as shown by the statistics, can be very closely related to the hard times. Now that the good times have returned, I think you will find that the farmers will go back to purchasing tile, and so there will be an increase in the consumption of tile in the State that will be marked to a high degree. That is my best judgment about it. The farmers have all accumulated wealth. They have good bank accounts, and the intelligent farmers know that money put into the ground in the shape of drain tile brings good returns. I think during these years of depression he has been handicapped by the hard times.

Secretary Stoll: Don't you think they are using larger tile than has been the case in former years.

Mr. Plumb: With us the call is for large tile.

Mr. Mamer: I think, myself, that a great deal of the tiling that was done eight or ten years ago will have to be done over again. The tile have gone to pieces, and all that can be found of the tile drains is a red streak.

Mr. Eudaly: That is the very worst things you could put in print.

Mr. Mamer: Why not say it, if it is true? In our vicinity the plants turn out about 50 per cent. culls, and they sell them, and then they go to pieces.

Secretary Stoll: I think the reason the farmers will have to do this tiling over again is because at first they used such small tile, and now they want to put in more tiling. Where they put in four-inch they will put in eight-inch, and where six-inch were put in they will put in ten or twelve-inch. I have also understood that where soft tile were put in the ground they would get harder.

Mr. Skinner: I will bear out Brother Stoll in what he says in regard to tile getting harder after they are put in the ground. If the tile is made of the proper material and put together right, it will not leave a red streak in the ground. Of course, if the tile is not made of the right material and not burned right, it will go to pieces. In the future farmers are going to use larger tile and are going to drain more. The farmers have had it in their head that drainage was simply to take off the surplus water, and they have done that and thought it was the only thing. But now a great many of them are laying tile in their high ground. Every one knows that these high places become dry and covered with a crust, but if you will put in tile it will become loose and moist. I believe that tile will be in more general use from now on.

Mr. Pike: I want to say that if people are making tile which, after they have been in the ground a few years, go to pieces in the ground, they had better quit making tile.

Mr. Mamer: I want it understood that we are not making these tile.

Mr. Pike: This is confidential. I thought so much of my old plant that I even stayed with it nights. Well, I sold my plant to some fellows; they are the nicest kind of people. I tried to get them both to come here to the Conven-

tion, and the argument they used was, "Well, you fellows get together and have a nice time, and get up a lot of papers, and we read them in the papers, and we know most as much as some of you fellows do, and we have only been in the business a year." They will burn a kiln right up to the stopping point and then throw the door wide open, and say "Why, the kiln is burned all right, and we want the tile, and what is the use in waiting?" And they unload them just as soon as they are cool enough to handle. They unload the tile and put them on the yard, and they are a whole lot of culls. These are the tiles that make the red streaks. The writer of this paper is rather pessimistic. I am an optimist myself. The future of the tile business is going to be better than you think. Farmers are getting better prices for crops. And they are going to put in large tiles, and these factories that are running with small dies will have to put in large dies, or they will not be able to keep up with the procession.

George J. Walter: I want to say a word about this. I think it will be a good deal the fault of the tilemaker if the farmers put in small tile. I think they ought never to put down less than 3½-inch tile. I made 3,000 3½-inch tiles last year. This year I made 100,000 4-inch tile, and a great many more of larger sizes, as large as 14-inch, so I say my business is not on small tile, and it will not pay to make many more 3-inch tile, for they are going to take up the 3-inch tile and put down larger ones. As to these red streaks: I have made tile eighteen years, and I know I have made some bad burns, but I have never sold a man a lot of tile that would go to pieces. Some of those first tile are in the ground and doing good service, but they are three feet under ground. I think the tile will stand forever if they are burned hard. I do not recommend small tile. I do not burn them or try to, but I believe the laying of the small tile is the fault of the tilemaker in recommending them. He does it because he can make the small tile easier than the large ones. He thinks he can, but I can make the large tile as easy as I can the small tile.

Mr. Mamer: I would rather make a 12-inch than a 4-inch tile. I can make more profit on the 12-inch than I can on the 4-inch. From the first of June, 1897, to the first of June, 1898, we sold 130,000 4-inch tile. During the same time we sold less than half that many 3½-inch. The first year we were in the business we sold more 3½-inch than we did 4-inch. In the last few years the demand has fallen off on the 3½-inch and increased on the 4-inch. They use the 3½-inch for laterals. Brother Pike spoke about the pessimistic tone of the paper. Of course, it looks that way, but I was just quoting the statistics. I was somewhat surprised myself.

Mr. Skinner: I do not want to take up your time and prolong this discussion, which I think has gone far enough. Last year I made 12,000 3½-inch tile. That was 12,000 more than I will make again. I believe every tilemaker should stop making 3½-inch and make 4-inch, and as soon as he can get rid of the 4-inch tile it will be better for him. I would rather make a larger size tile.

Mr. Harbaugh: This is an Illinois Association, but, if we can sell these small tile in another State at good prices, why need we look after the sizes? I do not know how much the rest of you ship into other States, but I ship large quantities of tile into Wisconsin, and I sold in 1899 62,000 3½-inch tile, and could have sold 62,000 more of 3-inch tile if I had had them. I did not sell to exceed 10,000 of other sizes in that State. I am inclined to think that this land needs these small sizes. I will drop that question right now. Mr. Mamer talked about the overproduction in the tile business. We are apt to have that overproduction in the tile business, I think. I have done business all my life, and I can talk more on the business question than on the tile question or on burning, because I tell you right now I do not know anything about it. I can run the machine with any of you, but when it comes to the kiln I have to depend on some one else. What I want to get at is this: I cannot see why people who ve distant from a tile factory should buy tile for less than the people who live close to the factory. We go down in our pockets and pay out money for freight to the railroad company, and sell the tile for less than we do at home, as we have been doing in the face of com-

FAWCETT PLUMB, Streator, Ill.

petition which compelled us to do it, simply because there were too many plants. We either have to squeeze our neighbors out or have got to shut up our tile plant. So what are we going to do? Take the coal miner that runs his plant a part of the year and makes cheap tile, and we have to sell our tile cheap or only sell a small proportion of them. I have to ship three-fourths of my tile. This year I tried to put up the prices a little. I think my neighbors will bear me out in the statement that I was the first man in northern Illinois to ask an advanced price for tile. We are going to have fewer tile factories in our part of the State, or else they are going to manufacture brick and tile, which I do not believe can be done economically. If a brick factory is established in your town, let them make the brick and you make the tile. I believe the people who live a distance from the tile factory should pay enough for their tile so that we can pay our freights and our traveling men, and should not expect to get the tile as cheap as the home people do. I doubt if any of the tile men in our vicinity have made a dollar on the tile they have shipped, but competition is so strong that we have got to ship our tile or shut down our plants, and we cannot afford to do that. The money I have made this year I have made on the tile I sold at home.

Mr. Skinner: Why don't you cut down your capacity and sell your tile at home?

Mr. Harbaugh: You want me to run my plant but three months in the year. To run a first-class plant you want to run it just as long as you can. That would be a nice way to do business—keep your tile plant running but three months.

Mr. Eudaly: The thought has just occurred to me. I have tried for years to think of some brief way of illustrating the question of competition, and while sitting here it has just come to me. Last fall I attended a county fair where they entered a great many horses for racing. (I think there were ten or twelve entered for a running race.) Of course, the competition in a race of that sort would be very strong. In watching these horses sweep around that track there was one of them that had no competition at all from the start to the finish. Then following him there were two horses that had exceedingly strong competition, and then the remainder of the horses in that ring had still stronger competition. Some of them were in a bunch and some of them neck and neck, and it was, I think, the strongest competition I ever saw, and I noticed that the horses that were pressed the hardest plunged and made trouble, while the horse in front was steady and easy-going. I think that running race illustrates this question of competition.

Mr. Randall: Humanity is frail. We always find that every man has some weak point. I have often wondered what Mr. Eudaly's was. He does not drink or smoke, or stay out nights but now I see he is a horse racer. (Laughter.)

Mr. Harbaugh: I would like to hear from my neighbor, Mr. Wilson. This is the most important question that has been discussed in the meeting.

President Townsend: This question is, of course, open to all, but if we are to finish our programme as laid down for this morning, we will have to pass this by. Of course, we will be glad to hear from Mr. Wilson first.

Mr. Wilson: I come into competition with the Mendota Tile Co., of which Mr. Harbaugh is manager. We will have our hands full if we attempt to regulate the prices of the tile factories in the State of Illinois. We have taken into consideration the fact that business was dull and competition strong in '93, '94 and '95. John Brown will say to Jim Jones, "You are selling tile too cheap; now we will help each other and keep prices." It is not worth while for me to say I did not sell tile cheap in those years. I can say that the Mendota Tile Co. has sold tile just as cheap as any factory in Northern Illinois.

Mr. Walters: In those dull times I held my stock on my yard and did not sell them until I got a good price for them. (Applause.)

President Townsend: Let us take up the next number, Mr. Secretary.

Secretary Stoll: Unfortunately, the men who were to have the three following papers have not come, and have not sent their papers, so that the next on the programme is a discussion on "HOW TO MAINTAIN EFFICIENT LABORERS," To be led by Mr. Plumb.

Mr. Plumb: The secretary asked me

to lead in the discussion of this question. I have prepared no paper, but I have some ideas to offer. It seems to me, though I have had no experience along some of the lines I am going to suggest, that they will help us some. The efficiency of the laborer in any department will be—all other things being equal, granting that he is an able-bodied man—the efficiency, I say, will be determined by the interest he takes in the business. You get him interested from any cause, either on the pay roll or as an employe, or in a business way. Any of these three things will make him an efficient laborer. Take your own men, it seems to me you have to get out among them and find out what is the best remedy to apply if there is inefficiency. Now if a man likes his work and is adapted to it, he will do just as much as he ought to, other things being equal. If the work at which he is engaged is of a humdrum sort of a character in which he can take no interest, then you must get him interested in your success. If you cannot do that, then I do not know of any other way to reach him, except through the pay roll; there is none that I know of. These intelligent men keep their eyes open; they know what is going on; they know whether you are paying them fairly. These figures, which were given yesterday in regard to average paid common laborer, I jotted down for my own benefit, and they run from 11 cents to 20 cents an hour. The average pay for common laborer is about 14 1-3 cents, as reported yesterday. Now 15 cents an hour is very good pay. If any of you are paying less than that, all other things being equal, I think you should raise the price to 15 cents. The matter of carrying on the work in our brick plants by piece work I have not tried to any extent, and know very little about it. It is very likely that you will reach the interest of the laborer in that way. Give him a fair price where you can introduce this work and he will do a good day's work for you, perhaps in seven or eight hours. There are some people who cannot do that. If the laborer is intelligent and fair minded and the plant is doing fairly well, and is managed by a man who has any of human sympathy in him, he will welcome the idea of profit sharing. I do not suppose that any of us are interested in this, but I do believe we are drifting toward it. Now suppose that $1.50 is the price paid for common labor, and your skilled labor is above that, and your men are employed continually, and you go to them and say: "I want to pay the uniform wages paid throughout the State, but I want to give better than that; I will give you a share in the profits we make throughout the season." You say: "I have $40,000 invested in my plant; you take good care of the plant; keep it in good repair and I will pay 6 per cent. of all the profits." If you do that you have done well. Now we have this union labor coming up. Labor is being unionized. If you get into trouble with the union you have got to take it. You have no remedy except a fair deal. Deal with them fairly, pay them fairly, offer to do the right thing, and they will respond to it. In a short time any trouble that you get into will clear itself up if you make them feel that you are treating them fairly. The employer has got to get out among his men and get acquainted with them. Go and see them and ask them questions. Find out how they like the business. Offer little suggestions. If you know more than he does, let him know it. If he knows more than you about a certain point, consult him, dignify him. Get him to become interested and know you and what you want, and he will become an efficient man. (Applause.)

Mr. Skeele: I have been very much interested in what Mr. Plumb has said on this subject. I believe it is one that concerns us very much. It is a lamentable and distressing fact that too often a man, on entering your employ, becomes your enemy. And something should be done to change the present state of affairs. Mr. Plumb has covered the ground, but I want to emphasize what he says. I feel there is a great deal in it. The question of profit sharing is coming to the front to stay, I think, with the class of men who are intelligent enough to appreciate all that profit sharing means. After setting aside a fair interest on the capital invested, we say to our men that we will divide with them, at the end of the year, a certain percentage of the surplus, besides paying their wages, for their continuance of efficient service. I believe nothing will go so far to improve our output and increase the quantity and strengthen our influence with the men in our employ as this principle of profit sharing. The man who takes the best care of his employes, keeps his premises in a clean condition, gives his employes a place to put their clothes and their dinner pails and a good, comfortable place to eat their lunch, and in some of these trifling, but effective, ways makes his employes comfortable, makes them feel they are looked after, makes them feel they are not machines, will get the best work possible at the least cost.

Mr. Eudaly: This will be a question, I suppose, as long as time. I was very much interested in the remarks of Mr. Skeele, together with those of Mr. Plumb. I think they were after this question in just the right direction. The idea of Mr. Plumb's of interesting yourself in your employe, and helping him, is just one of the grandest things that a man who employs men can do. I believe we are all agreed as to that.

Mr. Skeele: I beg for just one moment to say that this idea, this modern altruistic notion regarding profit sharing, is not new entirely. In New York city they have organized a society and they publish documents regarding the progress this movement is making and explaining the idea of profit sharing, and give items and ideas that go to help out in this question. Any one interested can become a member by the payment of $2, and this will entitle them to all the literature. If any one desires the address of the secretary I will be glad to give it to him.

Mr. E. M. Heafer: I do not intend to make a speech, but I have been listening to Mr. Plumb and Mr. Skeele and Mr. Eudaly with a great deal of interest. I think that, as a rule, men like to be treated well, like to be recognized. If you happen to be talking to them and a business man comes in to see you, and the business man is a distinguished person, the men like to be introduced to him, if it is only as "John, the man who shovels our clay," or "Jim Johnson, the man who looks after our kilns," even if the visitor is Mr. Vanderbilt. I think Mr. Vanderbilt would not object, and it makes the men feel good. As Mr. Skeele has said, you should have some conveniences for them—a place to put their clothes, and also a good place for them to eat their lunch. I saw some men the other day who were working for one of the railroads. It was a bitter cold day, and the men were eating their lunch right out in the cold and their hands were blue and numb, and if they had not been so hungry I am sure their mouths would have frozen up. I said to my brother, who was with me: "It is awful that these men have no place to eat their dinner." He said: "They might at least give them an old freight car," and I said, "It may be that the freight cars are none of them open," but it did seem to me that on such a day these men should have some place to eat their dinner. We ought to treat our men as though they were men and not machines, and the better you treat your men the better work they will give you.

Secretary Stoll: The next on the programme is a paper on "The Outlook for Beginners," by Mr. Heafer.

Mr. Heafer: When the Secretary wrote me, asking me to write a paper, I told him I would not write a paper, and thought that settled the matter. When I got home from Springfield, the other day, I found my name on the programme, so I thought I might as well prepare a paper, and here it is.

THE OUTLOOK FOR BEGINNERS.

By E. M. Heafer, Bloomington.

In discussing any subject the writer or speaker must, when such subject has different meanings, first determine which meaning is to be considered, and if the secretary, who, I presume, assigned this subject, were a beginner I would think he was anxious about his future and desired to know whether then the calorific agents would be coal, wood, natural gas, petroleum or brimstone. In other words, it is necessary for the writer to ascend the watch tower of the tile maker, and, after indulging in as comprehensive a view as he is capable of, not only tell where the beginner is at, but also predict where he is going to be at.

Probability ranges from zero to unity, therefore he who undertakes to foretell events may consider himself a lucky offspring of chance if he attains an eminence above zero equal to the depth of his final position below unity. In former years cities were built on the banks of rivers and they became prosperous as well as expansive because of the advantage they derived from water transportation, but now the certainty that pertains to transportation by rail, coupled with the uncertainty that attaches to transportation by river, has caused the death of many a river town and prevented the healthy growth, development and expansion of many others. Even the tile maker has incidentally contributed numerous and extensive subterranean aqueducts whereby the rivers are administered an overdose of aqua at one time, while they are denied a sufficient quantity for commercial purposes at another. Many a prophet on account of these changes was compelled to take in his sign. About twenty-five years ago a reader of the Scientific American was impressed by heavy editorials that electricity for illuminating purposes was a practical impossibility, while now every city of importance in the civilized world affords a practical denial of this great journal's assertion.

In the year 1874 a few others and myself

were beginners. Then in order to sell one's products it was necessary to convince the farmer that tiling the soil was tilling the soil as it was to persuade him that your "goods" were "good goods." In fact, I always thought I should sell without question as to their quality. However, as an act of friendship or something else I always advised the prospective purchaser that before purchasing he should have due regard to quality. In support of the proposition that the tiller of the soil would be a real beneficiary if he used drain tile many quaint facts and suppositions were set before his eyes or sounded upon the tympanum of his ears. For instance, we were in the habit of saying, "They do it in Indiana," "They do it in Ohio," and we used to sing the song that Johnston, of New York, imported tile from Scotland for use in New York at great cost, but also with great profit. So often did we sing this song that we became ashamed to sing it forward, and for variety's sake used occasionally to sing it backward. Some tile makers (myself I believe it was) advertised that inasmuch as the use of tile would cause a production of more and sounder corn the producers would have proportionately less cobs to haul to the market, and since they cause the water to percolate instead of flowing over the field there would not be so much fine, rich Illinois soil carried to the Gulf of Mexico. It is unnecessary for the beginners of to-day, particularly in the great North and West, to educate the farmer along this line, for the latter usually knows more on the subject than the former. Moreover, this knowledge has begun to pervade the Southern States, and no doubt cane and cotton will have to take off their hats to this scheme of under-drainage. It seems, therefore, that one is fully within the confines of truth when he asserts or, more correctly speaking, when he predicts that one-half of the country is not yet more than half drained, while the other half is just about half ready to begin.

Not so much originality is required of the beginner of to-day as of the pioneer of yesterday. But as the latter began with the manufacture of two-inch tile and had customers who wanted them smaller, and is now manufacturing twenty-four-inch, so the beginner of to-day may yet make them large enough to ride a horse through. However, he must not use the horse and sweep, for nowadays the horse would be ashamed of the sweep and the sweep would be just as much out of style in its debut as in its exit.

Perhaps from no other cause did the old tile maker experience as much regret as he did from the fact that so extensive tracts of land were possessed by one owner, for the large land owner did not by any means drain as extensively in proportion as did the owner of a few acres. The tendency of the times, it would seem, is manifested in the divisibility and greater distribution of lands. Such manifestation should encourage the beginner of to-day. There is, however, a drawback to the business that cannot well be removed. It lies in the fact that owing to the lasting quality of drain tile one can hardly expect to replace tile he has once sold. One must buy new horses, new wagons, new plows and new binder twine, but he plows over the same old drain tile perhaps his three score and ten years. Even then probably the necessity of the purchase, if one is made, does not arise from the fault of the tile. Still, if I were starting in the tile business to-day and were possessed of the same knowledge I am now possessed of I should look forward to a day not far remote from the present when the opportunity would be afforded me of furnishing tile to replace inferior ones (made and sold by my competitors) that have been interred and the opportunity of replacing many others that, owing to faulty interment or the employment of too shallow ditches in very level fields, have filled with water only to suffer from the descent of Jack Frost.

Locality is important to the beginner, since there are so many places where tile have been employed so profusely, that now few are needed. Perhaps it may be said as seriously as it may be said jocosely that the farther one plants himself from Bloomington, the less cause he will have to send in his regrets.

In the nature of things, the manufacture of drain tile can not, in general, be a permanent business. The writer cannot remember in an experience of a quarter of a century, a single instance wherein he sold tile to replace others, except when the latter were too small, while in most cases of this character, the tiles so sold were auxiliaries rather than substitutes. To express the idea more clearly, if there are eight hundred tile factories in the State of Illinois, whose proprietors are now making a living, the great majority will soon have to discontinue operations in their present locality. This will necessarily result not from artificial but from natural causes. Then will the old tile-makers, possibly more than the new ones, pass in their checks. Many will be too old to hunt new fields. To a large extent it will be a question of the survival of the fittest. On one tombstone will appear the epitaph, "Here lies Fullbore white heat, born in the drain-tile business in 1874, died in the tile business in 1905." On another, "Here lies Cherryred Smoothbore, born in the tile business in 1900, died in the tile business in 1905." This does not give the beginner a very prolonged life, but it is the best we can do for many who are so near sighted as to start where the field has already been covered.

It must be conceded, I think, by all close and interested observers that the highways of the country, considered with reference to underdrainage, have not received the attention to which they were entitled. Let it not be understood, however, that criticism of our Highway Commissioners is intended, for, no one is better aware than the writer that this class of officers has

S. H. Alsip, Belleville, Ill.

had so many improvements to make, to render it impossible to accomplish the line of drainage one-half that which ought to have been done. While their requirements were unlimited, their funds were limited. But many improvements have been made that will not have to be made again. It may fairly be presumed that our favorite work will receive its due and proper attention. If the writer is not deceived in the aim, purpose and ability of the good roads association, whose scope is national, the Highway Commissioners will find this organization, owing to the general system adopted and advocated by them, capable of effectual and advantageous co-operation. The fundamental principle of their plan is underdrainage—not here and there, but everywhere. To carry out such a plan has heretofore been impossible, but it is now not only possible but practicable. If the highways should be improved along this line and in this manner, the tile makers of to-morrow, many of whom are the beginners of to-day, will enjoy a degree of prosperity that has not fallen to the lot of their predecessors. Moreover, this scheme of highway underdrainage is the only impregnable barrier that stands between the farmer and the enthusiastic advocate of hard roads. Hasten along this plan; bury tile across the road, along the roadside, and wherever needed in a thorough and systematic manner, and the voice of the hard roads advocate, let it be thankfully said, will not disturb the peace and welfare of the farmer for at least a decade. The writer does not expect to be a beneficiary of these improvements, but if it will benefit the beginner, him who sells as well as the farmer, him who buys, let the good work go on.

At all times in the history of civilization the world has had an unfavorable experience with trusts. In the past it was a mere infant capable only of infantile exertion and infantile results. To-day it is an organized giant and apparently still growing. What relation does the beginner in the tile business sustain to this monster? He has not yet been around to buy us up nor has he appeared to crush us. In fact, so far as the tile business is concerned, he has kept hands off. "He generally knows a good thing when he sees it," and, it must be confessed, this is not complimentary to the tile business. The tilemaker in general does not have so much to fear in a trust as he has from him who burns and dries his tile with free fuel as found in the natural gas region. The fact is, tile factories are too small, as a general thing, as also too numerous. Besides they are scattered all over the universe, while, if twelve or fifteen hundred were bought up, it would not require great capital to start up twelve or fifteen hundred more willing to be bought up. Again, inasmuch as the manufacturer realizes that the freight for a very short distance is equal in value to the contents of the car in which the goods is shipped, he, if he wishes to expand, becomes unpleasantly cognizant of the fact that his business is necessarily limited to a short radius. In a word, the business cannot, under present conditions, be concentrated. Tile cannot be shipped from the Atlantic to the Pacific nor from the Lakes of the North to the Gulf of Mexico. The beginner of to-day thinketh not much about the trusts and the trusts thinketh still less about him. To-morrow it may be different. While factories may spring up like mushrooms, those that may be erected in opposition to the wish of the trusts may find the latter in control of the labor market or they may be in position to cause a discrimination in freight rates, or they may control the output of coal so that carbon, which produces the desired caloric of the tilemakers, may be furnished at reasonable rates, only to the members of the trusts. What will the anti-tilemakers do then, poor thing? So long, though, as the present quality of drain tile made to-day will satisfy the requirements of the consumers there is no danger that the trust will be able to secure a monopoly of the clay banks, for these are as numerous as the molecules of the sphinx.

The trust is an active and magnificent factor in the commercial operations of to-day and some think he is a mere Lilliputian of to-day who will develop into the Brobdingnagian of to-morrow.

Recently he has divided the country into arbitrary zones. Those zones, where the fight with his competitors will continue to wax warm, may be termed the torrid zones. Those zones where he freezes out his competitors with celerity and dispatch may be termed the frigid zones. There are no temperate zones. He does not wait for an invitation. Even where your legislation bids him not come, he goes to New Jersey, procures his credentials, flings them in your face and you simply smile and say "Come in." So far, individuality has prevailed in this business, but if the trust should prevail in the future, most of the beginners will become his managers, and since he will be able to procure labor more cheaply, buy his coal and other things at lower rates, while he can sell tile at higher prices, most "local managers" will receive greater compensation for their services than they would for their individuality.

In conclusion, it may be said that the outlook for beginners is flattering, provided too many do not become flattered. To succeed, however, he must, at least, maintain the present excellence of our products, and in the nature of things he should certainly surpass the present standard. He must study the subject of underdrainage, for it will be a more complex subject than heretofore. Moreover, since it is a business that cannot at present (and probably not in the future) be indefinitely expanded, the proprietor should acquaint himself with details, the business to be performed and the profits to be realized are not sufficient to justify the maintenance of a Board of Management.

But an old timer might proceed without limit to dole out advice to the newcomer while the latter would let it "go in at one ear and out at the other." Frequently, too, he will do well to discard the advice. In my second year I concluded to substitute coal for wood for the purpose of burning tile, but all the old tilemakers I consulted advised me not to do it as this form of fuel applied to this purpose had always failed. I am only too glad that I let it go in at one ear and out at the other.

President Townsend: I feel that Mr. Heafer has handled this subject in such a manner as to leave no room for discussion.

Secretary Stoll: I had hoped to get a paper from George F. C. Dolle, of East St. Louis, who is a miner and shipper of high-grade clays, and so is competent to talk on this subject, but he has been called South, so could not attend, and did not send his paper. The next is a paper, "Why Burned Clay Is Superior to Other Materials," by Mr. George Gillen.

Mr. Gillen: Having been sick in bed for the past two weeks, and having been in the habit of putting off until to-morrow what I did not do to-day, I have not given this subject as much attention as it should have received. It is a great subject, and we should all give it more attention. I presume there are a number of things in the paper that might well be left unsaid, and there are a great many things that I have not said that might be said, but I hope you will overlook its shortcomings.

WHY BURNED CLAY IS SUPERIOR TO ALL OTHER MATERIAL.

Geo. Gillen, Cautrell, Ill.

This is a subject that should be studied by all who are engaged in manufacturing material made of burned clay, which I am sorry to say is not the case in this day and age and the only reason I can give is that clay has been used so long that persons engaged in the burning of clay have come to the conclusion that all is known in regard to it, that nothing can be said on the subject that will interest the person using material in building, paving or work of any kind, yet we find men engaged in the lumber trade busy explaining why lumber is supeior to all other materials.

The man engaged in handling stone loses no time in telling why stone is superior for foundations, buildings, street pavements and everything that comes in contact with his material.

The machine men are always ready to tell you why their machines are superior to all other machines.

The inventors of kilns are always ready to tell you why their kilns are better than other kilns in burning tile, brick and pottery.

Every merchant is ready to tell you why his goods are cheaper and better than his neighbors, but the manufacturer of burned clay is unconcerned, works hard and says nothing.

Why should we not have something to say as well as our competitors? We have a good subject to discuss and if studied as it should be be, we can convince people that we are far in advance of our competitors in price and quality of material.

When we think that people know all about burned clay we are badly mistaken. I will guarantee that not one person in twenty-five in Illinois to-day knows that burned clay is superior to all other material and that burned clay was considered to be far superior to wood or stone from the building of the Tower of Babel down to the present day.

In all foreign countries and in the eastern part of the United States, where we find mountains of rock and lumber, brick is used for buildings and foundations, while in Illinois, especially where stone and lumber is scarce, frame buildings are erected and much stone is used for foundations.

Is it not time that the clay workers of the western States especially, wake up and make a study of the material that they manufacture and bring this subject before the people, show them that we are not standing still in our profession, but that we are advancing and that the clay burned at the present time and the material used (since we are using improved machinery and kilns) is far superior to clay used in years gone by, and that we are keeping up with the times and with all other material used.

Now in regard to my subject, when I speak of burned clay, I do not mean dried clay or smoked clay but a clay that has been burned to a perfect body and has a good clear ring to it, and when I speak of clay, I do not mean sand, loam or trash, but a heavy, stiff, sticky clay with a good body to it.

Now to find why burned clay is superior to all other material, let us go back to past history and find where burned clay was used and what it was used for, and see if we can find other material that has stood the test of burned clay.

About four thousand years ago the Tower of Babel was built of burned clay and not of dried clay mixed with straw, as told by many people, as we find in the oldest history of to-day, the Bible, in Genesis xi, 34, these words spoken by the children of Israel, "They said one to another, go let us make brick and burn them thoroughly, and they had brick for stone and slime had they for mortar." They went to work and built a tower 272 feet each way at the base and had reached a height of 660 feet, when God not wanting them to remain at the same place, destroyed it so they would scatter and inhabit the whole earth.

This was the largest structure ever erected and had it not been for God's power that tower would never have been destroyed.

The ancient Tower of Babel is now a mound of oblong form; on the western side it rises in a conical form to the elevation of 198 feet, and on this summit is a solid pile of brick 37 feet high and 28 feet wide. The fire-burned brick have inscriptions on them and so excellent is the cement or mortar on them, it is almost impossible to extract one from the other. During Pharaoh's time brick was used in the erection of nearly all buildings; next we find that 2,575 years ago Babylon was rebuilt, and it was the most beautiful city in the world; it was 60 miles in compass; it was built in a square, fifteen miles on each side with a brick wall 87 feet thick, 350 feet high, on which were 250 towers; the top of the wall was wide enough to allow six chariots to draw abreast. Burned brick was used in the erection of the walls and they remained perfect for about 200 years, when after a siege of two years they were destroyed by Cyrus.

Many enameled brick are found in these walls and Pliny says the Babylonians used to record their astronomical observations on tile or burned clay. He also, as well as Vitrevena, describes the process of making brick at Rome and says the Greeks prefer brick walls to stone.

Brick pyramids are mentioned by Herodotus, erected by King Asythes.

We find upon a pyramid ten leagues from Cairo this inscription, "Do not undervalue me with pyramids of stone, for I am better than they as Jove exceeds the other deities, I am made of brick from clay brought up from the bottom of the lake adhering to poles."

All through Babylonian times brick was used exclusively, some were of dark red color while others were of light yellow.

The name Babylon is found on monuments of the eighteenth dynasty 3,500 years ago. The great Chinese wall was built of burned brick on the outside, filled in with dirt and stone; the top is plaited over with brick and covered with moth; it is 25 feet wide at the bottom and 15 at the top and from 15 to 30 feet high and 1,500 miles long; the towers are also built of brick; it was built about 2,400 years ago and the walls and towers are in good state of preservation in most places.

Much of the most important history of ancient times is found daily among the ruins of Palestine and all through ancient Rome inscribed on burned brick or tile, the name tile is given to clay burned in squares and larger but not so thick.

The Egyptians preferred tile and brick for books, as we call them, as fire and water would never destroy them.

Many specimens of brick are to be seen in the British Museum with inscriptions indicating their date and purpose.

The bath of Titus and Caracalla was built of brick and stone; the brick are perfect while the stone are not.

In their forts and walls in Great Britain, brick of an excellent quality are found, of deep red color, well burned and very hard.

Brick was first used in Holland for street paving and proved very good.

In traveling in foreign countries you will find no wood, iron or stone used in walls or structures of any kind, as perfect as you will find brick.

I have now given you a brief sketch of a few of the brick used abroad and will now cross over to our own country; coming to the city of New York we still find a few buildings erected of brick burned in Holland and shipped across the great water. That was in the day and age when a Dutchman thought nothing but Dutch clay and a Dutchman to make them could make a good brick, but time and experience has taken the conceit out of them and to-day they acknowledge that Yankee clay will also make good brick.

We find many brick buildings in Boston, New York and Philadelphia and all eastern cities that were built from one to two hundred years ago and they are good substantial buildings yet. We also find a few buildings built of stone, but not as substantial as the brick buildings.

On my travels in the East last September, I was surprised to find so many old buildings built of brick, and to find them so perfect.

Take Carpenter Hall and the walls look as if they would stand for all time to come.

Many church spires, from 100 to 200 feet high, built 50 to 150 years ago, facing many storms but still solid and firm.

I was also surprised to find at least nine-tenths of all the new buildings erected are brick buildings and no stone used in their construction.

Experience and what the people of the eastern cities can see every day teaches them that brick is the cheapest and best material that can be used at all times.

A brick building looks well when a frame building is ready to tumble down; it costs less to keep in repair and is fireproof.

Many persons in Illinois claim a stone foundation is better than brick. Such is not the case. You can't put stone together, tie them one over the other and make them as solid as you can brick and there never was enough weight put on a good brick in a wall to crush it, while I have seen two stone walls or foundations, in the past two years, that were crushed by the weight upon them.

Our State House at Springfield and the Lincoln monument were built of stone and built but a few years ago, and they have been propping both ever since they were built. The monument had to come down. It would not prop any longer and the State House will cover up a lot of politicians one of these days. They say it is the foundation. I say it is the stone. If it were the foundation, why is it that the lightest part of the buildings are falling first?

As to material for street paving we find the cedar block has come and gone, especially in Springfield and Chicago. Asphalt has come and will soon be ready to disappear for all time to come. It reminds me of a very heavy sleet of ice, beautiful to look at but very dangerous and slippery to tread upon, and soon melts away, something in the order of the State House—it takes considerable propping.

Granite is found to be expensive and not any more substantial than the majority of paving brick made at the present time.

The paving brick now is far superior to the paving brick made fifteen years ago, and yet the brick made fifteen years ago is doing good work and has worn fully as well as any of its competitors and it is admitted by nearly all that a well burned brick made of good shale is as cheap and as good as any other material used in street paving.

Brick Walks—That is a subject that has been very much neglected by manufacturers of brick. All will admit that a brick walk is far superior to a board or plank walk, but the universal opinion among the people has been that brick is too expensive, even among brickmakers, and yet a brick walk can be built for less money than either a board or plank walk. Take a paper and pencil and go to figuring and you will be surprised to see the difference in the cost of the two.

I make it a point to explain this to many of my customers and I find sale for many brick I would not sell if I had not called their attention to it.

In November a man in the city of Springfield concluded to put a walk in front of his residence. He ordered his lumber, went home, told his neighbor what he was going to do. His neighbor said, "Why don't you use brick?" The old cry was, "It costs too much." His neighbor told him it

was cheaper than lumber. He figured and found his neighbor was right, rushed to the telephone, canceled his order for lumber, called up the brick man and ordered brick.

How many brick men are here to-day that could have told that burned clay was not only superior to other material for sidewalks, but that it was cheaper and cost less money to begin with?

Now whenever your "city dads" order plank walks put down, just walk up to them and put in your bid for brick walks and you will get the job every time.

I do not have time to enumerate all articles made of burned clay, but I will say in conclusion that we all know that wood will soon fade and decay, that asphalt will freeze, thaw and crumble, that stone is rough, will crumble and go to pieces in case of fire, that iron will rust and warp in case of fire, that no climate, no fire, no water can destroy burned clay; in short, it is the cheapest and best material in use today and I challenge any one to bring any material that will outlive burned clay in durability, strength or beauty. It will never be equaled, and I hope that in the near future all persons engaged in the burning of clay will give more thought to the work they are engaged in, read up and become acquainted with the history of burned clay used the past 4,000 years, what it was used for and where it was used; then show your customers when, why and where they should use the material you manufacture, and stone foundations and frame buildings will not be so plentiful over these prairies of the West where we find plenty of good clay, very few stone and very little timber.

I am glad to see the Clay Worker is calling our attention to old brick structures and giving such good descriptions of the same.

I find that the brick buildings in Illinois, as a rule, were built of very inferior brick, made of inferior clay, and that no provision was made to keep the dampness out of the house, and so we hear a great howl everywhere about brick houses being so damp and wet, yet it costs nothing to overcome this evil A hollow space, one inch in the wall, will keep out all dampness or you can build your wall solid and nail one by two inch strips inside of the wall. Nail the lath on these strips and dampness will never be found inside of the house.

Again, we find complaints about the mortar in brick. Use nothing but a gritty sand, slack your lime wet and your plaster will be almost as hard as the brick, but fine smooth sand and lime slacked dry will never hold the sand; it has no body and the lime no life, therefore it will soon peel and crumble in the wall.

Now, brother clay workers, wake up; get your brains in good circulation; loosen your tongues; don't think your hands are the only members of your body you can use in making and selling burned clay; use brain, tongue and hands; get out of the old rut; let people know why we burn clay, what it can be used for, in what way it is superior to other material and our industry will soon outgrow the United States, the strongest and best nation in the world. and in a few years the manufacturers of burned clay will be known as the leading manufacturers of the world.

President Townsend: We have listened to a good paper, and we have a little time in which we can discuss it.

Mr. Converse: I want to say one word about this paper. I have never been active in getting ordinances passed providing for brick walks, still I have done some things, and I want to say to you that nearly all the cities in central Illinois have passed a sort of an ordinance providing for brick walks. Owing to the lack of additional expense and the durability of brick over other walks, these towns and cities have adopted that sort of an ordinance. And I think brickmakers are justified in securing action of that sort, not alone for the purpose of putting money into their pockets, but because such action results in benefit to the people.

Mr. Heafer: I suppose we all ought to pat each other on the shoulder, especially before the public. We should all agree as nearly as possible. But I could not get my pencil to figure out this problem in the same way that Mr. Gillen's pencil figured it. Of course, it depends on the specifications for making the sidewalks. If you take a specification for a board walk, as you find it in any city, it seems to me it would only cost one-third as much as a good brick walk, and especially when you have to have a foundation for a good sidewalk; but, whether that be true or not, it is certainly better, and an ordinance for brick walks should be adopted by every city. About fifteen years ago we were having a great deal of trouble in Bloomington about lawsuits. People were being injured by the board walks, and then they would sue the city, and finally we passed an ordinance providing for brick walks. We had hard work getting them in, but now you can hardly find a wooden sidewalk in Bloomington. Since that time these walks have never cost the city a cent. We had a few cases where people slipped on the ice and tried to get damages, but it never amounted to anything. I do not want to question Mr. Gillen, because he has probably given more thought to the matter than I have; but I cannot figure it out as he does.

Mr. Skinner: What sort of a foundation do you have under the sidewalks in Bloomington?

GEORGE GILLEN, Cantrall; Ill.

Mr. Heafer: In the first place, it is possible that the ground is properly prepared and does not need any filling; then we simply dig a trench and leave an embankment on the outside. When the sidewalk has to be constructed, then the ordinance requires four inches of cinders. We have to dig a trench about four inches deep, and then put in four inches of cinders, and then slack. We have plenty of it there; it is very fine, and makes a nice, smooth surface to put the brick on. But where the ground has already been filled in it is not expensive. In the ordinance we have passed, where the people do not want to have such work done, the city would grade and excavate and fill in with cinders and slack, and then the people have to pay the assessment. That was very unpopular, but we have never deviated from it, and now there is no special objection to the assessment. If the party does not attend to such work within a certain time, the city will do the work and then charge it up to him.

Mr. Gillen: I do hope that when you go home you will all make it your business to search the histories for information in regard to claywork. You will all be surprised at what you will read. I was very much surprised myself to find the uses to which clay has been put and for what it has been used, and if we will make it our business to talk about these things and tell people why burned clay is better than other material we will do much good, both for ourselves and for the people generally.

Mr. Skinner: In regard to this question, I only wish that every business man and city official would have time to read this paper. I see that this afternoon we are to be in the hands of the local committee on arrangements. We heard something last night of the kind of a city Ottawa is, and this afternoon they are going to show us some of her factories. We do not want to keep this committee waiting, and so I think we had better leave this discussion now and take up the rest of the programme.

THE TREASURER'S REPORT.

President Townsend: The next in order is the report of the Treasurer.

Secretary Stoll: As you know, gentlemen, Treasurer Stare is now sojourning in Porto Rico. He has sent me a check covering the amount of funds in his hands, which will be turned over to the new Treasurer. This, together with the membership fees paid, shows a very substantial increase in the funds of the Association. I am pleased to report that there is a satisfactory increase in the number of members enrolled.

President Townsend: We will now hear the report of the Committee on Resolutions, if Chairman Hurlbut is ready.

Mr. Hurlbut: Mr. President and gentlemen of the Convention, your committee begs to submit the following report:

REPORT OF COMMITTEE ON RESOLUTIONS.

The Illinois Clay Workers' Association, in convention assembled, learn with deep regret the loss of two of its honored members during the past year, a loss that will be felt not only in their respective localities, but throughout the State. They were honored and respected by everybody with whom they came in contact and their sterling qualities and untiring energy especially commended them to the members of this association with whom they have labored so faithfully in the past, and

Whereas, It has pleased our Heavenly Father to remove from our midst and from all earthly cares our dearly beloved brothers, Jesse Johnson, of Pana, Ill, and William Malone, of Peoria, Ill., the members of this association beg to extend their heartfelt sympathy to the bereaved ones in the hour of their great affliction, and be it

Resolved, That this resolution be spread on the records of the association and the secretary be instructed to forward a copy of same to the families of our departed friends.

Whereas, The pronounced success of this, our twenty-second annual convention, is very gratifying, the number of members in attendance being a substantial increase over that of a year ago, and the tireless interest manifested in the promotion and growth of the association assures us a steady growth in the years to come; and

Whereas, The success of our meeting is in a large measure due to the untiring efforts of the officers of the association, we extend to them our thanks for their labors in the past and bespeak for them the best wishes and good will of our respective members; and

Whereas, The officials and citizens of the city of Ottawa have spared no effort to make our visit to their charming city a pleasant one and have furnished not only a convenient headquarters, but a hall elegant in all its appointments for the use of our convention, and have given us an opportunity of visiting the different clayworking establishments in and near Ottawa; and

Whereas, The worthy mayor, Hon. M. T. Moloney, in his memorable speech of welcome, delivered to our esteemed president for use of the members, the keys to the city and with the local committee, E.

W. Bach, E. J. Hess and J. H. Holland, did all in his power to assist in entertaining the city's guests in a princely manner, and the Aeolian Quartet and Mandolin Club, for their music, which was enjoyed and appreciated by every one at the banquet, and added immeasurably to the social feature of the occasion, therefore be it

Resolved, That the sincere thanks of our association be extended to them, one and all, for the happy manner in which we have been entertained and that we will ever remember our visit to Ottawa as one of the most pleasant in our experience. We also extend our thanks to the Ottawa press for the full and complete reports of our proceedings and we also wish to thank the managers of the different local clay-working establishments for the courtesies extended.

H. W. HURLBUT, Chairman,
J. M. ELDER,
DR. A. L. CONVERSE,
Committee.

On motion of Mr. Hurlburt, seconded by Mr. Pike, the report was adopted.

President Townsend: The next is the electon of officers. Nominations for President are now in order.

Nominations were made in the usual form and resulted as follows:

THE OFFICERS ELECTED.

President, E. J. Hess, Ottawa, Ill.
Vice-President, E. M. Heafer, Bloomington, Ill.
Secretary, G. C. Stoll, Wheaton, Ill.
Treasurer, A. L. Solfisburg, Aurora, Ill.

President Townsend then called Mr. Hess to the chair and introduced him to the Convention.

President Hess: The suggestion that I be made President of this Association was a complete surprise to me, and the election to this office is the nicest compliment you could have paid me. Being one of the younger clayworkers of the Association, I consider it as quite an honor. I was not born in Ohio, but I shall endeavor to fulfill the regular duties of the office properly and to the best of my ability, and I again thank you, gentlemen, for putting me here, and assure you I will do the best I can to carry out the wishes of the Association. (Applause.)

Mr. Randall: It is customary to have the officers inaugurated, and we want to hear a speech from each of them. We want to see what kind of metal they are made of.

President Hess: I will ask Mr. Plumb to escort our newly elected Vice President to the chair. It gives me great pleasure, gentlemen, to introduce to you Mr. E. M. Heafer, whom you all know as well as I do, if not better.

Mr. Heafer: I feel a trifle embarrassed. I did not come here with the expectation of getting an office, and I am not only gratified, but surprised. As Mr. Hess has said, I am not an Ohioan, but I will try to be a good officeholder just the same. I presume the duties of this office are not very heavy, but I will perform them as best I can. Inasmuch as Mr. Randall has suggested that I come up and show my metal, I will hand it over to the Secretary. (Mr. Heafer handed the Secretary a silver dollar in payment of his membership fee, amid laughter and applause.)

President Hess: I think the members of this Association took special care that no officer was elected from Ohio, and I will ask the treasurer to come forward and say whether or not he is from Ohio.

Mr. Solfisburg: I am a sucker (laughter)—born in Illinois. I do not suppose I had better say anything. You have had hot air enough to-day. I think it would have been a very good plan, if we had saved up some of the hot air we had last night and taken it home and burned your brick with it. You could have saved fuel bill. I see now there will be some inducement for me to go to Porto Rico, and will be glad you elected me treasurer. (Laughter.)

Mr. Converse: I want to tell the young gentleman that I have confidence in his ability and integrity and honesty, but I want him to understand that he cannot take the rest of us for suckers. (Laughter.)

President Hess: Perhaps he was only judging from appearances. We will now hear from our secretary.

Secretary Stoll: Members of this Association, I am deeply grateful to you for having again elected me to this office. I think this is the thirteenth or fourteenth time I have been elected, and I can only say that I will do my best to serve you as in the past. The interesting part of my speech is yet to come,

Lincoln Solfisburg, Treas., Aurora, Ills.

when I tell you that I have a small bill here, amounting to a little over $29, which I would like to have paid.

The secretary then presented a bill for current expenses, which was ordered paid.

Mr. Heafer: If I did not know better I would say that Mr. Stoll was from Ohio, considering the political move he has made in keeping that bill back until after election.

President Hess: He has been holding this office for at least twelve years, and he is on to all the tricks. The local committee has made arrangements to take the convention to visit the different industrial establishments this afternoon. Street cars will be waiting in front of the hotel at 1:30 p. m. In order not to obstruct the regular order of traffic I have been asked to have the members in readiness at the appointed hour. We can make the round trip, without going to the outside factories, by half-past 3 or 4 o'clock, if we start promptly. The Business Men's Association having joined us in this arrangement, we will visit other industries besides the clayworking establishments.

On motion of Mr. Randall the convention adjourned, subject to the call of the executive committee.

THE BANQUET.

The social features of the Ottawa Convention was an exceptionally pleasing function. It consisted of a complimentary banquet tendered by the clay manufacturers of Ottawa and the Ottawa Development Association, and was held in the spacious dining hall of the Clifton Hotel. Owing to an important meeting, which required the presence of the mayor and other notables, the banquet was deferred until 10 o'clock. This proved a pleasant innovation from former occasions. The members seemed to thoroughly enjoy the opportunity for social intercourse. If all the trade secrets and experiences which were exchanged in the various groups through the hotel lobbies between supper time and the banquet hour could be compiled they would make a very large volume and one of immense practical value.

Promptly at the appointed hour, Secretary Stoll announced that all hands were wanted in the banquet hall, and, following the lead of Mayor Moloney and Toastmaster Converse, the party was marshaled into the dining hall, where plates were laid for one hundred guests. When all were seated there were but few vacant chairs. The tables were prettily decorated with flowers, and at each plate was a pretty buttonhole bouquet. The following menu was excellently served:

MENU.

Consomme.
Broiled Whitefish.
Prussian Potatoes.
Radishes Olives
Tenderloin of Beef, Larded, Mushrooms.
Asparagus Julienne Potatoes
Oyster Patties.
Roman Punch.
Cigarettes.
Broiled Quail, with Bacon.
Green Peas Saratoga Chips
Lettuce-Tomato Salad, Mayonnaise.
Ice Cream Cake
Coffee.
Cigars.

During the gastronomic exercises a mandolin quartette, with piano accompaniment, discoursed sweet music. This part of the entertainment lasted until 12 o'clock.

When Toastmaster Converse called for order there was a shuffling of feet and turning of chairs, as the members settled themselves for the mental feast, which was assured by the following list of formal toasts and songs:

TOASTS.

Dr. A. L. Converse, Springfield, Ill.
Toastmaster.

Mine Host.....Aeolian Quartette
The Clay Bank on Which We Meet—Ottawa .....Hon. M. T. Moloney
We, the Visitors.....Mr. W. A. Eudaly, Cincinnati, O.
Ottawa's Clays .....Mr. R. C. Jordan, Ottawa, Ill.
The Clay Worker.....Mr. H. B. Skeele, Chicago, Ill.
The Old Canoe.....Aeolian Quartette
Biography of an Old Clay Bank.....Mr. Jason Richardson
The Present—"We'll Be Dead a Long Time".....Mr. John Maddigan, Peoria, Ill.
Prospects of Ottawa.....Rev. A. M. Quirk
In Absence .....Aeolian Quartette
Our Competitors—"Friends or Enemies"..Mr. H. W. Hurlburt, Macomb, Ill.
The Absentees .....Mr. T. A. Randall, Indianapolis, Ind
Auld Lang Syne.....Aeolian Quartette and Everybody

Dr. Converse is an ideal toastmaster, being possessed of a fund of anecdote and ready wit that enables him to keep his audience keyed up to concert pitch. The opening song demonstrated that the Aeolian Quartette was a rare musical organization. Their numbers were ren-

dered in a manner that evoked rounds of applause, to which, in each case, they responded with short humorous songs, which added greatly to the evening's entertainment.

Mayor Moloney welcomed the visitors to Ottawa, and told them of its great natural advantages in a way that convinced every listener that a great future is before the Queen City. He concluded by again tendering the freedom of the city to the visitors, and assured them if they saw anything they wanted they were at liberty to help themselves. Mr. W. A. Eudaly responded in a very forceful and entertaining manner, which left no doubt in the minds of the local people that their efforts were appreciated. Mr. R. C. Jordan, one of Ottawa's leading merchants, told of Ottawa's clay resources, which are immense. His subject was a dry one, but he wove a thread of humor all through it. Mr. H. B. Skeele, of Chicago, paid a very pretty compliment to The Clay-Worker and its editor, and then discoursed upon the importance of the industry of clayworking, and fully demonstrated that the faithful clayworker is a benefactor always, and will prove a more important factor in the future than in the past. Mr. Jason Richardson, of Ottawa, changed his toast to that of "Our Friend, the Architect," and easily convinced his hearers that architects as a rule are ever ready to co-operate with the clayworker in the introduction of every form of architectural clay ware. The absence of Mr. Maddigan, who was called home unexpectedly, made it necessary for Toastmaster Converse to call for a substitute, and Mr. Fawcett Plumb filled the breach admirably. Mr. L. F. Shoch was substituted for Reverend Quirk, who was unable to attend, and treated the banqueters to a splendid recitation of "St. Peter at the Gate." D. O. Loy rendered an original poem, and Mr. T. A. Randall paid a fitting tribute to the absent members, and closed by introducing W. G. Worcester, a graduate of the Ohio School of Ceramics, as a type of the scientific clayworker. He talked in a manner that indicated an enthusiasm in the work which insures success. Mr. H. H. Windsor, of Chicago, followed with a series of anecdotes which tickled the risibles, and the evening's oratory was brought to a close by what Toastmaster Converse termed a scientific contest for points between "Eddie" Pike, of Chenoa, Ill., and "Willy" Cunningham, of Frankfort, Ind., to determine whether we are in the nineteenth or twentieth century. Each succeeded in convincing himself that the other was wrong. All then joined in "Auld Lang Syne," and, though the hands of the clock pointed to the hour of 4, the revelers dispersed with seeming reluctance.

THE ANNEX AND ANNEXERS.

The "middle man," or machinery manufacturers and dealers, kiln and dryer men, etc., were not slow to appreciate the advantages afforded by the cozy ante-rooms of the convention hall for the display of models and printed matter. Early Tuesday forenoon the walls were decorated with drawings and blue prints of kilns, etc., and the tables were piled with catalogues and trade journals. The Clay-Worker slate calendar, with the Convention dates attached, were as conspicuous as Hartwell and his silk tile, while the little hat calendars were in constant demand. We often wonder what becomes of them all. In one corner was a pretty model of Alsip's new kiln furnace, while near by was another and similar miniature reproduction of Grath's coking table furnace, and near it a model of the same gentleman's new hand-power press, which he and his modest assistant, W. C. Mitchell, exhibited with much pride. Swift, of Iowa, divided his time with his new partner, and between them they fully met the demand for information about coking table furnaces. The inimitable descendant of Irish kings, John Moroney, explained the merits of the Berg press while he was resting, occasionally putting in a word for other Anderson machinery. A gorgeous drawing of the Eudaly kiln made its presence felt as plain as did that orator himself. Affable Gledhill was always in evidence in the ante-rooms or convention hall during the sessions, never losing a chance to tell of Freese machinery. Simpson, the indefatigable, was equally in the public eye, ever and anon waving a new Frost engine catalogue on high, though not so high but that Elder

Dr. A. L. Converse, Toastmaster, Springfield, Illinois.

and his elevator and screen were with him. These two worthies get more for their money Convention week than any other single pair of pace-makers within our knowledge. Cunningham, with his Big and Little Wonders and automatic cutters, cut a wide swath, while the busy secretary found time to distribute a goodly quantity of the American Clayworking Machinery Co.'s abundant variety of printed matter. Lehmann, like Purington and Gates, was late on the scene, but after appearing lit up the surroundings by a smile as continuous as his largest kiln. While last, but not least, we mention good Father Pike, without whose genial presence a Convention would be a barren ideality. Those who think they must stay in the exhibition room at all hours in order to catch every possible customer, might profit by Father Pike's example. He never misses a minute of any session, nevertheless we never heard of anyone looking for New Discovery kilns in vain. Pike is always in the right place at the right time. When the Convention is in session the Convention hall is the right place, and Pike is there. The moral is plain to those who do not shut their eyes.

SEEING OTTAWA.

Next to the banquet the trip to Ottawa's manufacturing establishments was the most pleasing feature of the Illinois Convention. At 1:30 those who wanted to make the trip, and we believe there were none who did not, boarded the trolley cars in front of the hotel, and, like a band of Brownies, went merrily on their way.

The first stop was at the silver works. Here we were inducted into the mysteries of manufacturing white metal and silver-plated table ware, card cases and small household ornaments, such as card baskets, vase holders, etc. It was noticed that most of the work was performed by boys and girls, special machinery enabling them to quickly form all kinds of ornamental work with precision.

Next we were conducted to the glass works, and viewed with wonder the army of workmen turning out lamp chimneys. The roar of the blast furnaces, the seething mass of molten glass and the hurrying of men and boys to and fro with their blow pipes, from which dangled a little globule of melted glass, which with the deft twist of the wrist and a puff of breath in the twinkling of an eye became a thing of utility, all formed a picture that made a lasting impression on every observer. Many souvenirs were carried away, some to be shattered before the next stopping place was reached.

At the Pioneer Fireproofing Co.'s works the party felt more at home, and while there was less of novelty to please the eye, the round of the plant under the guidance of genial J. H. Holland, superintendent of the great plant, and an ex-Hoosier, by the way, proved very interesting. As the plant was fully described and illustrated in the December Clay-Worker we will not now dwell on the details further than to remark that it was very perceptible to all that a vast capital of money and brains was represented in machinery, dryhouses, kilns and other fixtures which go to make up a modern clayworking establishment. Other members of the company, too, gave the visitors the glad hand. Mr. W. A. Moulton, the secretary of the company, made the rounds with us, answering all manner of questions bearing on the various features of the work.

The party returned to the Clifton House feeling well paid for the time devoted to sightseeing. For a time there was the buzz of conversation, then the bustle of departure, and amidst a tumult of good-byes visitors hurried to their trains, each and all bearing impressions of kindly hospitality that will ever make Ottawa a pleasant word to them.

List of Members.

Argillo Tile Works.....Argillo, Ill
D. O. Loy.....Atkinson, Ill
Lincoln Solfisburg.....Aurora, Ill
H. F. Townsend.....Avon, Ill
Charles Stookey.....Belleville, Ill
S. H. Alsip.....Belleville, Ill
Elder & Dunlap.....Bloomington, Ill
E. M. Heafer.....Bloomington, Ill
George Gillen.....Cantrall, Ill
Thomas Trainor.....Cayuga, Ind
Mamer Bros.....Campus, Ill
George J. Walters.....Chatsworth, Ill
Chicago Brick Machinery Co....Chicago, Ill
M. L. Emerich.....Chicago, Ill

Wm. A. Moulton.....Chicago, Ill
H. H. Windsor.....Chicago, Ill
H. J. Kenfield.....Chicago, Ill
I. C. Waterbury.....Chicago, Ill
C. B. Shefler.....Chicago, Ill
M. C. Smith.....Chicago, Ill
A. R. Mercer.....Chicago, Ill
D. V. Purington.....Chicago, Ill
F. Lehman .....Chicago, Ill
W. D. Gates.....Chicago, Ill
H. B. Skeele.....Chicago Heights, Ill
E. M. Pike.....Chenoa, Ill
W. A. Eudaly.....Cincinnati, O
L. H. Martin.....Dwight, Ill
W. M. Pratt.....Earlville, Ill
D. E. Kretsinger.....Egan, Ill
H. C. Patton.....Flanagan, Ill
W. R. Cunningham.....Frankfort, Ind.
Wm. Simpson (Frost Engine Co.).....
....Galesburg, Ill
E. M. Freese & Co.....Galion, O
T. A. Randall & Co.....Indianapolis, Ind
J. J. W. Billingsley.....Indianapolis, Ind
N. E. Potter.....Kewanee, Ill
W. H. Lyle.....Kewanee, Ill
LaSalle Pressed Brick Co.....LaSalle, Ill
Wm. Hammerschmidt.....Lombard, Ill
Illinois Mfg Co. (W. H. Hurlburt)....
....Macomb, Ill
J. H. Wheeler.....Marseilles, Ill
F. A. Martin.....Mazon, Ill
C. A. Harbaugh.....Mendota, Ill
A. M. Combs.....Mechanicsville, Ill
G. H. Buck.....Morris, Ill
J. M. Powell.....Orestes, Ind
E. W. Bach.....Ottawa, Ill
D. F. Larriaux.....Ottawa, Ill
E. J. Hess.....Ottawa, Ill
W. W. Nash.....Ottawa, Ill
B. B. Holland.....Ottawa, Ill
C. B. Hess.....Ottawa, Ill
A. B. Clarke.....Ottawa, Ill.
J. A. Wilson.....Paw Paw, Ill
J. D. Jensen.....Pekin, Ill
John Maddigan.....Peoria, Ill
M. Deering.....Peoria, Ill
A. E. Giles.....Peoria, Ill
F. R. Carter.....Peoria, Ill
Robert Unzicker.....Peru, Ill
George French.....Polo, Ill
Wm. Stare.....Ponce, Porto Rico
A. S. Curry.....Reddick, Ill
A. Thomas.....Roselle, Ill
H. Secker.....Roselle, Ill
M. Schmidt.....Secor, Ill
W. H. Steep.....Seneca, Ill
A. L. Converse.....Springfield, Ill
W. P. Grath.....St. Louis, Mo
W. C. Mitchell.....St. Louis, Mo
H. Lambert & Son.....St. Mary's Ill
Fawcett Plumb.....Streator, Ill
J. Fargo.....Streator, Ill
C. C. Barr.....Streator, Ill
A. J. Bushong.....Streator, Ill
T. C. Tridell.....Streator, Ill
George H. Kettel.....Tipton, Ia
J. W. Skinner.....Varna, Ill
C. O. Swift.....Waverly, Ill
F. E. Swift.....Washington, Ia
J. R. Campbell.....Washington, Ia
A. E. Gray.....Waverly, Ill
G. C. Stoll (American Clay-Working Machinery Co.).....Wheaton, Ill

THE OHIO CONVENTION.

The twenty-first annual meeting of the Ohio Tile, Brick and Drainage Association will be held at the Council Chamber, City Hall Building, Columbus, O., Tuesday and Wednesday, Feb. 13 and 14, 1900.

—Programme.—

First session, Tuesday, 9:30 a. m.:

1. Enrollment of Members.
2. Report of Members on Past and Present Condition of Trade.
3. Reports of Secretary and Treasurer.
4. President's Address .....
....J. W. Everal, Westerville, O.

Second session, Tuesday, 1:30 p. m.:

5. Construction of a Modern Brick and Tile Plant.....
.....W. C. Wilson, Brice, O.
6. Experience and Observation of a Clayworker.....
.....John W. Kellough, Cook, O.
7. Hollow Blocks .....
.....E. Biglow, New London, O.

—Questions for General Discussion.—

8. Are Glazed Hollow Block More Durable than Red Unglazed?
9. What Is the Cause of Brick and Tile Crazing?
10. Can Tilemakers Manufacture Roofing Tile Profitably?

Third session, Tuesday, 7 p. m.:

11. Address .....
..Prof. Edw. Orton, Columbus, O.
12. The Manufacture of Clay Wares..W. A. Eudaly, Cincinnati
13. A Success in the Manufacture of Tile .....
.....Frank Halbeisen, Erlin, O.

—Questions for General Discussion.—

14. How Do You Figure the Cost of Ware?
15. Some of the Lame Places in the Tile Business.
16. Is a Lien Law a Real or a Fancied Protection to Tilemakers?

Fourth session, Wednesday, 9 a. m.:

17. Washing of Clay for Tile and Brick.....A. M. Fish, Milan, O.
18. Best Means of Promoting Sales of Tile.....
.....F. P. Diller, Bluffton, O.
19. Farm Drainage .....
J. J. W. Billingsley, Indianapolis

—Questions for General Discussion.—

20. Will All Clay Shrink in Burning?
21. Does It Pay to Weather Clay?
22. Can Thorough Pugging Take the Place of Weathering?

Fifth session, Wednesday, 1:30 p. m.:

23. Address, Practical Achievements of Science Applied to Clayworking .....
..A. V. Bleininger, Columbus, O.
24. Hollow Block vs. Frame Houses ....
....Ed F. Darnell, Grove City, O.

—Questions for General Discussion.—

25. What Will the Clay Manufacturers Do to Meet the Advance in Railroad Freight Rates?
26. Reports of Committees.
27. Election of Officers.
28. Adjournment.

J. W. EVERAL, President.
E. F. DARNELL, Secretary.

TRUE PHILOSOPHY—GOOD BUSINESS.

An Old Adage Illustrated.

THE ACCOMPANYING letter speaks well for the Frost dry pans and engines, for it indicates a growing popularity. It also speaks well for The Clay-Worker for it is the only clay journal in which the Frost Manufacturing Co. have advertised for the past few years, and consequently they know the source of the "inquiries that develop into orders." These are the kind of inquiries that The Clay-Worker brings its patrons. Experienced advertisers know that there is as much in the quality of inquiries as the quantity that a medium brings. A cheap paper never pays as well as a good one, though they may sometimes bring many inquiries. In advertising, as in other things, the best is the cheapest.

T. A. Randall & Co.,

Indianapolis, Ind.

Gentlemen:-- We are in receipt of your letter of yesterday in which you ask us how our trade has been the past year.

Our sales for 1899 have been larger than for any of the forty eight years we have been in the business. It became necessary for us to refuse orders as we had taken more than we could fill about July 1st last. We have already contracted to furnish more Engines and Boilers than we can manufacture during the next twelve months. The result of this condition of affairs is that we are forced to expand. We have contracted for machinery for a complete new plant which, when done, will be a model manufacturing plant for this line of business. We will cover about six acres and hope to be able to fill all the orders we can land from now on. Our advertisement in the CLAYWORKER is bringing us inquiries in every mail, many of which develope into orders.

Yours very truly,

THE FROST M'F'G CO.
Andrew Harrington Sec'y & Treas

DETROIT'S BRICKYARDS.

THE EARLY HISTORY of Detroit's brickmaking industry is a simple tale. It dates back a hundred years, or thereabouts, when, as the primitive ways of the pioneer settlers gave way to the demand for better homes than the log cabins of the frontier, some unrecorded builder, more progressive than his neighbors, dug into the surface clay with a home-made wooden spade, tempered it with the feet of his oxen, or perhaps his own, molded it by hand into brick, one at a time, dried them in the sun and burned them with wood from the adjacent forest. Doubtless he performed every detail of the work with his own hands, though possibly he was assisted by his wife and children. From this small beginning has grown a great industry.

At a little later period brickmaking assumed a more important status and became the vocation of a class of hard-working laborers. Then it was a trade. After another decade or two it became a respectable business, requiring skill and intelligence, no less than brawn. It was only with the past generation that the business attained the dignity of a manufacturing industry.

Some fifty years ago Mr. R. H. Hall, a sturdy and progressive pioneer, began making brick by hand in the good old way, in the locality now known as Michigan and Twenty-eighth streets, which long since became a well-built residence district. Being a progressive man, of strong force of character, Mr. Hall took up with whatever promised improvement, and as the business grew he introduced mechanical aids that, as is always the case, were in time adopted by his neighbors. So Mr. Hall, more than any other individual of his time, left the impress of his character on the brick interests of Detroit. Perhaps this is indicated in a measure by the fact that the two largest manufacturers in Detroit to-day, Mr. Conrad Clippert and Mr. F. H. Wolf, began work as boys on Mr. Hall's yard, and continued in his employ until able to start in business for themselves. Imbued with the same spirit of enterprise which characterized Mr. Hall's work, they have been the first to introduce improved methods of work in that locality.

Mr. Hall was the first to mold brick by machinery in that section, putting in what was called Hall machines, two of them, with two horses at each machine to grind the clay, and six men making 10,000 brick a day. Wood was then used for fuel, and cost $1.50 per cord, delivered at the yard. The brick were delivered at the job for from $2.50 to $3 per thousand. This was about 1858. Labor was then hired at $12 to $14 per month for single men, including board, and $18 to $20 for married men, with house rent and wood free. Mr. Hall changed his yard from horse power to steam power in 1862. Then a period of inflation began, and the price of brick soon went up to double that which had prevailed before.

1. Women and Children Edging Brick. 2. Turning Brick on Pallets. 3. Getting in a Supply of Fuel. 4. Tank for Soaking Brick Molds.

Another pioneer brickmaker of this section is Mr. John Greusel, who is still living, and has been making brick until within the last year or two. After Mr. Hall's death, which occurred some years since, his brick plant was continued in operation by Mr. R. H. Hall, Jr., who is now at the head of the firm of the R. H. Hall Brick Company, which is still a leading factor in the business.

—Where Detroit's Brick Are Made.—

Springwells is the euphonious title of an erstwhile suburb of Detroit, lying some four miles to the west, but is now a part

Chas. Clippert & Bros. Brick Co.'s New Brick Plant.

of the city, having been annexed Chicago fashion. The locality derives its name from an abundant supply of spring water. This, coupled with the fact that there is a surface clay deposit nearly ten feet in depth, extending over all that section, has led the brickmakers to group their plants there. Located along Michigan avenue, the city's main thoroughfare extending west, are a dozen or more soft-clay brick plants, which furnish virtually all the building brick used in and about Detroit. The Hotel Cadillac, which will be headquarters during the Convention, fronts on Michigan avenue. A trolley car can be taken at the door which will land the visitor in front of or within a short distance of any of these brickyards.

The First Kiln at Clippert's new Plant.

Until the past year these yards have all been of the sam general character, so much so that an inspection of one answered for all. The clay is dug by hand, hauled in carts and dumped into soaking or tempering pits. There are two of these pits for each machine, each holding enough clay for a day's run. Used alternately, the clay is allowed to soak for twenty-four hours. An endless chain elevator extends lengthwise between the pits, so the clay can be shoveled into it easily and thus carried up to and dumped into the machine. Only soft-clay machines have been used, and these were almost exclusively from the shops of the Huettemann & Cramer Company, local manufacturers.

From the machine the brick, in most cases, are dumped upon the ground. After drying a few hours, they are turned on edge, and a little later on are piled in rows six to ten high and left until taken to the kiln. The edging and piling is done mostly by women and children, the wives and sons and daughters of the male employes. A few of the yards have used the rack and pallet system of drying. The kilns are the old clamp type, built up, cased and daubed with each firing.

For the past few years crude oil has been used almost exclusively for burning, but recent advances in the price of oil make its continued use impractical, so that the brickmakers are now arranging to go back to coal. This, too, is an expensive fuel, owing to the long haul. For this reason anything that promises a lessening of the fuel bill is of prime importance to the Detroit brickmakers, and they will be on the *qui vive* for information bearing on the burning question at the coming Convention.

The conditions named, which have prevailed for years past, seem in a fair way to give place to other methods, for during the past year two marked innovations have been made by the representative firms previously mentioned.

—Clippert's New Brick Plant.—

The Geo. H. Clippert & Bro. Brick Company has gone a mile beyond its old yard and built a new soft-clay plant that is thoroughly up-to-date in every respect. In the clay bank a Chambers Bros. cable hoist and dump car take the place of the horse and cart. The clay is dumped into the pugging hopper of a new Monarch machine from the shops of the Wellington (Ohio) Machine Company, and, presto change! is turned into good, square brick at the rate of 4,000 an hour. A new feature we noticed here is a hopper to the left of the striker, into which are thrown all the cappings and other tailings. A bucket elevator carries the same up and dumps it back into the machine. It is an idea of Mr. Chas. Clippert, and works very nicely. They have built and are operating a new six-tunnel

Clippert's New Monarch Machine and Crew—Cappings Hopper to Left.

twelve-track steam dryer, built by the American Blower Company, of Detroit, which holds 100,000 brick, and with which the Clipperts are very much pleased. They are thinking of building some permanent kilns, with furnaces for using coal or slack. They already have a Jones underfeed stoker under their boilers. This yard has the advantage of a railroad switch into the plant, so that they can ship by rail if occasion requires. Hauling is done chiefly by wagon. They have four machines at the old yard, which will be operated through the summer season, giving them a total annual capacity of nearly 20,000,000 brick. As those who attend the National Convention will find, the Clippert Bros. are wide-awake, up-to-date brickmakers and very clever gentlemen.

—The F. H. Wolf Brick Company—

Is another progressive firm. Mr. Wolf, Sr., needs no introduction to the old members of the N. B. M. A., as he has attended several Conventions. The past year has been an eventful and busy one for him, for he has installed on his already extensive yard a new Chambers stiff-clay outfit for making end-cut brick. He got a late start, but has made enough brick to know that they are of such excellent quality that he anticipates no difficulty in disposing of them to the Detroit builders in competition with the soft-clay brick. He has also put in a new six-tunnel steam dryer of the Standard Dry Kiln Company's make. This operated so satisfactorily that when we visited him last he was building another six-tunnel section. He hopes to have the plant in operation Convention week, and visiting brickmakers will be welcome to inspect it if they wish. He expects to make both stiff-clay and soft-mud brick the coming season, drying the latter on the open yard and in pallet racks.

Returning to Michigan avenue (Mr. Wolf's plant is some four blocks to the south) and again boarding the trolley car, we are whizzed by the yards of Lonyo Bros., Procter Bros., E. Daniels and a number of others. The last in the row is that of L. D. Haggerty & Son. We found Mr. Haggerty, Sr., in the cosy office, which is a part of a ladder manufacturing enterprise which he and his son operate in addition to the brickyard. This gives them plenty to do in the winter time, when the brickyard is closed down. They have four Duplex machines, but have only operated three during the past year, averaging, all told, about 48,000 brick a day. These are dried by the rack and pallet system and burned in clamp kilns of from eight to twenty-four arches, averaging about 25,000 brick to the arch. The brick are set forty-six high, and are burned with oil in about seven days, the watersmoking requiring two to three days of this time. Mr. Haggerty informed the writer that the Springwells clay belt is some six to eight miles in length and two miles wide, ranging from seven to ten feet in depth.

—The Detroit Brick Exchange.—

During the past year the output of all the Detroit yards has been sold through the Detroit Brick Exchange, of which Mr. H. Houghton is manager. The Exchange sells all the brick and assumes all the responsibility of collecting from purchasers, etc. The brickmakers receive their allowances for brick purchased regularly each month, whether the collections are made by the Exchange or not. The plan is a good one, as

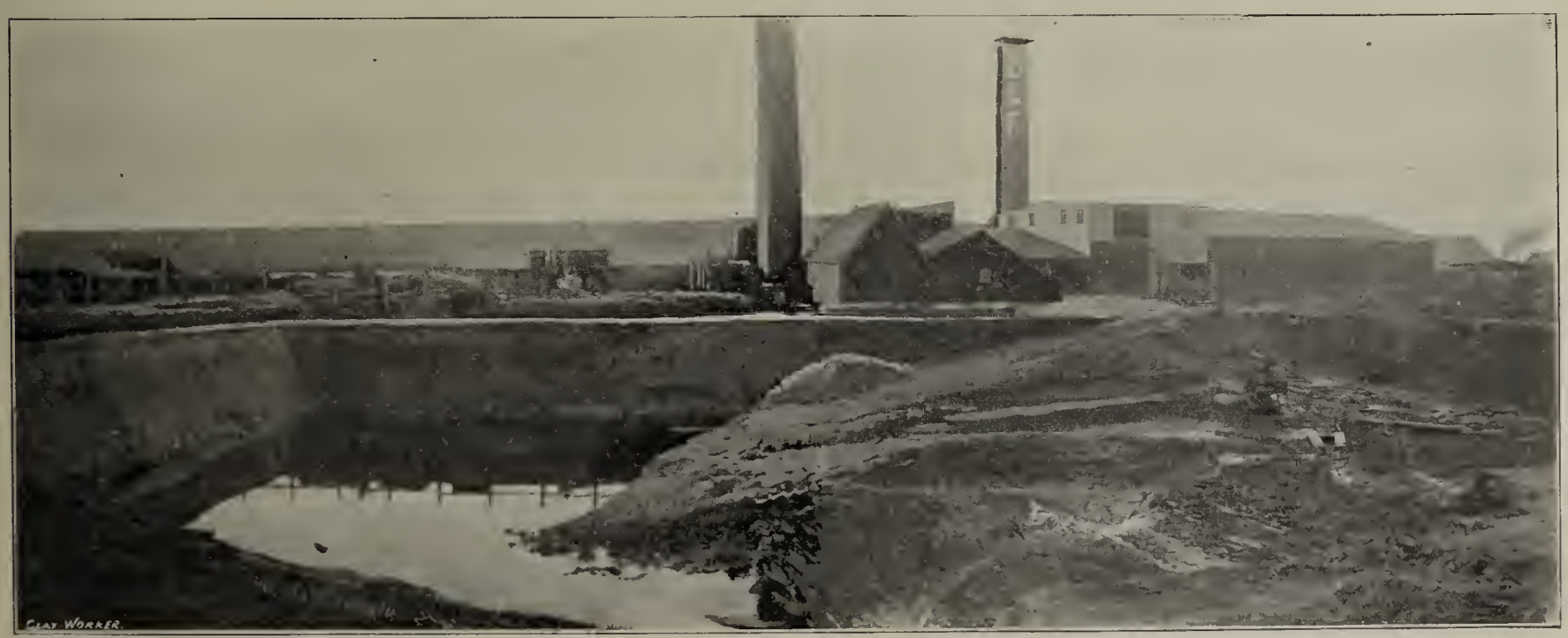
Mr. Andrew Lonyo visits Mr. Wolf and finds him up to his Knees in an Addition to his Steam Dryer.

it prevents the cutting of prices and consequent demoralization. The prices prevailing during the past year were as follows:

All soft brick, per 1,000	$5.50
Kiln run, per 1,000	6.00
All hard, per 1,000	6.50
Stock and sewer brick, per 1,000	7.00

This is for brick delivered at the job. An extra charge is made for long hauls and small orders. The demand for brick during the past year was not as great as was hoped for; still, the season was a fairly satisfactory one, and the Detroit brickmakers will be able to entertain the N. B. M. A. in a manner that will do credit to Detroit, and make all who go to the Convention happier and better for the trip.

A reader sends the following without credit: "Some people keep so busy minding their own business that they miss many fine opportunities to profit by the experience of others."—Ex.



The F. H. Wolf's Brick Co.'s Plant as Viewed from beyond the Clay-Pit.

TO THE BRICK AND TILE MAKER.

BY ALL MEANS, if you are a clayworker, go to the Convention at Detroit next month. Get away from your own business and go where you can learn what is being done by others in the same line. You will make but little progress, and that very slowly, if you have to depend on your own experience. You will meet many who, perhaps, like yourself, make but a few hundred thousand a year, and men who can make one hundred thousand a day.

You can draw upon their vast fund of information as freely as upon your own bank account without fear of protest, for they are the most liberal men in your calling. You will be a stupid listener if you do not learn something that will be profitable to you. One but a short time in the business, who had sold his farm and invested all the proceeds in a factory, said to me at the Indianapolis Convention that he was saved from bankruptcy by what he had learned in Convention.

Don't think you know it all. If you do, you are the most scientific man the past century has produced. Do you indeed understand the condititons most favorable and the devices of grates and furnaces best adapted to combustion; the utilization of heat in generating steam in drying and burning clay wares? Are you so familiar with the subject of ventilation that you can specify the best method of ventilating a brick and tile factory? Do you know the best form of kiln for any branch of clay wares, or even for those of your own branch, and the best method of handling it? Do you handle your brick in the most economical manner? Have you the best arranged and most profitable factory that you can have, and do you think that you make as good brick or tile as can be made from your clay? If so, you are blessed above many, and should certainly go to the Convention and "let your light shine."

Whether you are rich or poor, you will be greeted with smiles and fraternal handshakings. You may think that you know all that is necessary for you to know to be successful in the business, but if you do not find among the brethren men who are much better informed, you will learn that in the aggregate their information is much greater. It will be a great privilege to be able to draw upon such a fund. Go to Detroit, and if you want to know anything about your art, ask for it and you will get it.

Go to Detroit. You will not regret going. You will learn something profitable, and when you return you will take more pride in your business and be more ambitious to make yourself useful in it, after you have met with the intelligent, liberal, progressive men of the N. B. M. A.

GEORGE S. TIFFANY.

DETROIT'S BRICKYARDS—Lonyo Bros. Oil Tanks—Daniels' Kiln—Proctor Bros. Yard.

Front and Rear View of Haggarty's Plant.

WANTS A NEW LOCATION.

A subscriber writes that he and another experienced clayworker are looking for a desirable location for a brick and tile plant, and will be glad to correspond with any one who can give them information looking toward the erection of a modern plant in a good territory. Interested parties are requested to address communications to Lucius, care Clay-Worker.

PACIFIC COAST NEWS.

THE YEAR 1900 was ushered in amidst much noise and heavy rain, which latter has a retarding effect upon the clayworking interests of San Francisco and the coast. Generally speaking, however, it is no exaggeration to say that business is undergoing a strengthening process, and the outlook for the immediate and distant future is a long ways from gloomy. Last year averaged up very well for the brick and terra cotta people; in fact, it was a comfortable improvement over the few preceding dull years, and the present year has apparently opened under auspicious circumstances.

About the most important contract that has been secured in San Francisco for some time past has been awarded to Gladding, McBean & Co. It is the work for the new San Francisco postoffice, now in course of construction, at Seventh and Mission streets. The building is 210x320 feet, and three stories and a basement. Gladding, McBean & Co. will furnish all of the hollow tile fireproofing, the white enameled brick and white enameled architectural terra cotta, and the work will run into about $100,000. The new postoffice will be a very handsome and complete government institution, and will be fully in accord with the growing demands of San Francisco's business requirements. This improvement will cost the government about $3,000,000.

L. E. Clawson & Co. are doing considerable patent chimney work, and they expect to be busy through the entire year, which has opened very bright with this firm.

The Steiger Terra Cotta and Pottery Works are working on the entrance to the new Crocker Estate Building, on Post street, between Kearney and Grant avenues, in this city. This work is ornamental and pressed brick. The entire building was equipped by these people, but the entrance was put off until the last.

N. Clarke & Sons report considerable activity in general work, which keeps their plant at Alameda, Cal., quite active.

One of the great industries of the Pacific coast is located in Alameda, in the Clarke potteries, which were established there eleven years ago. The potteries employ sixty men. Business has been unusually good during the year, especially in the line of sewer pipe. Among the large contracts is that for the sewer system of Honolulu, which system is being vigorously constructed. The Alameda factory is also supplying vast quantities of terra cotta and fire-brick building material for Honolulu. Another, and what promises to be a greater, field has been opened at Manila. After three hundred years that city is being sewered, and the Alameda factory is supplying the pipe. This contract will require enormous quantities of pipe, and the terra cotta for building will soon be in very active demand there. Another big job during the year was the piping and terra cotta work about the Spreckels sugar factory, at Watsonville, Cal. Mr. Al Clark, resident manager, states that the building outlook for the year is uncommonly promising.

Gladding, McBean & Co., have started the construction of the concrete foundation for the large addition to their pottery at Lincoln, Cal. The new building will cover about one-fifth the area of the main building, the dimensions to be 85x190 feet. It will be built on the west side of the main structure, and will be three stories in height. One hundred thousand brick will be used in its construction. The addition will be utilized for drying rooms and a large new office, which will be elaborately fitted up. The building will be completed before the winter is over. The pottery has outgrown its present building, and the increased floor room is much needed.

Taylor & Heath, the tile men of McMinnville, Ore., are shipping a carload of tile to Polk county, that State. They will make further shipments there during the winter.

A lot of new machinery, consisting of a new crusher, new screen and other parts, was received at Newberg, Ore., recently, for the pressed-brick factory. When the new machinery is in it is expected that the capacity of the press will be greatly increased.

H. B. Nelson, the Weston, Ore., brickyard man, is preparing for a big season's run in 1900. He will furnish a large quantity of brick for Pendleton buildings, which are already under course of construction or are to be commenced just as soon as building material can be procured. Mr. Nelson will probably increase his output this year, and make more brick than in any previous year of his operations as a brick manufacturer.

Detroit's Brick Yards—Andrew Lonyo's New Plant—The Excavations are for the Soak Pits.

Among the latest improvements in Dawson, Alaska, is a large and commodious brick warehouse, erected in the business center of the town, the bricks being manufactured in Dawson from clay found in the vicinity.

The managers of the vitrified brick plant, east of Vancouver, Wash., expect to close the yard shortly for about three months.

It is possible that Los Angeles, Cal., may make an experiment with brick for street paving.

Simons Bros. have purchased the plant of the Inglewood brickyard, and will operate it in connection with their Pasadena and Los Angeles properties.

The Los Angeles Stoneware Company, of Los Angeles, Cal., reports business for 1899 very satisfactory, with even better prospects for next year. The company has taken a four years' lease on additional buildings, which will double its drying capacity. This is in anticipation of the increased demand for irrigation pipe supplies.

David Wilson intends to begin the manufacture of brick at Sumpter, Ore., as soon as the weather will permit. He will put in the latest and most improved machinery, that will turn out 20,000 brick per day.

A receiver has been appointed for Blakeley & Lovell, brickmakers at Butte, Mont.

SUNSET.

OFFICIAL ANNOUNCEMENT.

THE FOURTEENTH Annual Convention of the National Brick Manufacturers' Association will be held at Detroit, Mich., the week of Feb. 5 to 10, 1900. Detroit's reputation as a great convention city, her exceptional railroad facilities and central location, together with the prevailing prosperity, justify the expectation that this will be the largest Convention yet held.

—Headquarters During Convention.—

The meetings will be held in the Convention Hall of Hotel Cadillac, which will be headquarters during Convention, and, as it is one of the best hotels in the land, will afford the very best of accommodations for all who attend. A special rate will be made to delegates of $2.50 per day, each person, for court rooms, when occupied by two or more people. Single rooms and outside rooms without bath, $3.00 and $3.50. Rooms with bath, $3.00 to $5.00 per day each person, according to location, American plan. Those des'ring rooms reserved are requested to write direct to hotel, stating character of accommodations desired, and giving date of arrival.

—Exhibition Hall.—

Exceptionally satisfactory facilities will be provided for the exhibition of specimen brick, terra cotta, models of clayworking machinery, kilns, dryers, trade literature, etc., etc., in the Oriental Room, on the ground floor of the hotel. Space will be free to all members of the Association. There will be no charge whatever in connection with these exhibits, but each exhibitor will be requested to close or leave his exhibit during the time the Convention is in session. Those desiring space are requested to notify the secretary. Exhibits should be shipped in shipper's name, care Hotel Cadillac, in time to reach Detroit Monday, Feb. 5.

—Reduced Railroad Rates—

Have been secured on the certificate plan; that is, delegates and those accompanying them, if they pay full fare going, and take a certificate for same from the ticket agent, will be entitled to return ticket at one-third the regular fare, making two-third rate for round trip. Those starting from small towns should make inquiry of local ticket agent a few days in advance to insure the receipt of proper certificate. Where same cannot be obtained, however, a receipt from the ticket agent, bearing official stamp of ticket office, and stating that it is for full fare and in lieu of regular certificate, will suffice. Those desiring certificates should present themselves at the ticket office at least thirty minutes before departure of trains. These tickets will be good three days before and three days after Convention.

—The American Ceramic Society—

Will begin the week with a meeting in the parlors of the Hotel Cadillac Monday, Feb. 5, at 10 a. m. The sessions of this, the scientific, division of the National Association, will continue throughout Tuesday, and conclude with a session Wednesday forenoon. A separate programme for these meetings has been prepared and can be obtained by addressing Prof. Edward Orton, Jr., Secretary, Columbus, O.

PROGRAMME.

First session, Wednesday, 2:30 p. m., Feb. 7, 1900:

Prayer by.....Dr. James M. Thoburn.
Enrollment of New Members and Roll Call.
President's Annual Address....W. D. Richardson, Shawnee, O.
Report of Treasurer.....Jno. W. Sibley, Birmingham, Ala.
Election and Installation of Officers.
Appointment of Committees.
Address—"Progress and Prosperity".....
.....Grant Dibert, Pittsburg, Pa.
General Discussion, led by.....

WEDNESDAY EVENING, 8 O'CLOCK.

Annual Powwow, under the auspices of the Detroit Brick Manufacturers, will be held in the Banquet Hall of the Hotel Cadillac; F. B. Stevens, Master of Ceremonies.
A Theater Party will be given the visiting ladies, who are requested to assemble in the parlors of the Cadillac at 7:30.

Second session, Thursday, 9:30 a. m.:

"Business Methods in Clayworking".....
.....O. T. Denison, Mason City, Ia.
Discussion, led by.....
"The Clay Age".....Fritz Wagner, Chicago, Ill.
Discussion, led by.....
"The Man Behind the Pug Mill".....
.....J. H. Copeland, Birmingham, Ala.
Discussion, led by.....

—Questions for General Discussion.—

Do we make the best use of our clay banks?
What causes stiff-mud brick to blister? How may it be avoided?
Is there any advantage gained by using warm water for tempering or pugging clay?
Do not brick sell at a lower value than any other building material?
Which is the more satisfactory on common yards—day work or piece work?

Third session, Thursday, 2:30 p. m.:

"Discipline and Courtesy in a Brickyard".....
.....M. E. Gregory, Corning, N. Y.
Discussion, led by.....
"Setting Brick in Kiln or Kiln Draft".....
.....Warren Ittner, St. Louis, Mo.
Discussion, led by.....
Report of Committee on Trade Relations.....
.....Frank C. Manson, Boston, Mass., Chairman
"Drying Brick with Heat from Cooling Kilns".....
.....Robert P. Nesch, Pittsburg, Kan.
Discussion, led by.....

—Questions for General Discussion.—

Is there any economy in using exhaust steam for drying?
Is it practical to dry soft-mud brick in less than forty-eight hours?
From an economic standpoint, what is the most desirable length for a steam tunnel dryer?
Can common brick be made as cheaply on dry-press as on stiff or soft-mud machine?
Is it a fact that one end of a dry-pressed brick is heavier and denser than the other? If so, can it not be remedied?
Is there any real bond in a dry-pressed brick before burning?

Fourth session, Friday, 9:30 a. m.:

"Brickyard Pilgrimages".....Charles H. Bray, Helena, Mont.
Discussion, led by.....
"The Market Side of the Paving Brick Industry".....
.....F. B. Stevens, Detroit, Mich.
Discussion, led by.....
"Construction of Brick Pavements".....
.....George R. Grimes, Terre Haute, Ind.
Discussion, led by.....
Report of Committee on Technical Information.....
.....Prof. Edward Orton, Jr., Secretary.

—Questions for General Discussion.—

Would a thicker bedding of sand than is generally used tend to lessen the noise of brick pavements?
What is the best filler for brick pavements?
Is the rattler test a valid test for paving brick?
Can paving brick be made successfully on a soft-mud machine?
Have dry-pressed brick ever been used successfully as street pavers?

Fifth session, Friday, 2:30 p. m.:

"Kiln Experiences".....T. C. Lundy, Farmingdale, L. I.
Discussion, led by.....
"Down-draft vs. Up-draft System of Burning Brick".....
.....L. C. Moore, Memphis, Mo.
Discussion, led by.....
'The Continuous System of Burning".....
.....F. S. Naugle, Warners, N. Y.
Discussion, led by.....

—Questions for General Discussion.—

Why is the continuous kiln for burning common brick not in more general use in this country?

Are brick made of shale better for sewer and foundation work than common hard-burned brick?

Why is there such a lack of uniform system in the construction of brickyards?

Reports of Committees.

Miscellaneous Business.

Note.—No papers or essays not included in the regular programme will be heard unless previously submitted and approved by the Executive Committee.

At the close of each essay or address the subject under consideration will be fully discussed.

All formal resolutions should be presented in writing.

—Saturday Side-Trip Day.—

Saturday will be devoted to sightseeing in and about Detroit

Glimpse of Interior of Hotel Cadillac, Detroit.

under the guidance of the local Entertainment Committee. It is probable that two of the brickyards will be in operation at that time, and a trolley party will be arranged for those who desire to visit them. If desired, this trip can be extended to Ann Arbor, where those who wish may visit Michigan's State University. Belle Isle, Detroit's famous pleasure resort, while more beautiful in the summer time, is attractive even in the winter. Skating and other outdoor sports may be indulged in or witnessed.

—Membership Badge.—

Each member of the Association and accompanying ladies will be presented with an appropriate souvenir badge, the gift of the Detroit brickmakers, which will of itself be the open sesame to all entertainment and social features.

Brickmakers of America are each and every one cordially invited to attend the Convention and participate in the deliberations. Those from across the water, if any there be who can attend, will also be made welcome.

Those desiring information relative to requisite of membership, etc., are requested to address the Secretary at Indianapolis.

BUGLE CALL "ASSEMBLE."

NOW THAT the time approaches apace for the annual gathering of "clayworkers," it is well to consider the question in all its bearings. If it has paid you to go into the clayworking business, it is because you have kept step with the progress made; but if you have fallen in and tramped with the procession, it is possible you are along towards the rear. Now ask yourself the question, if it would not be better to push toward the front and form a part of the victorious line of battle and conquering host, rather than to be a mere unit among the aggregate.

You have been promising yourself, lo! these many days, that you would take a vacation; that you would go and see if there was any other "brickmaker" or "clayworker" who was more favorably (or unfavorably) situated, located or surrounded; or learn whether or not all of the published reports, descriptions and brickyard stories, etc., were fakes and moonshines, or de facto places where dirt, dust, mud, sand, grease, water, iron castings, fire, hard labor, wakeful toil, and anxious days, mixed up in certain proportions and larger and smaller quantities, combined to produce bricks and clay wares of various shapes, sizes, colors and designs, and were actually swelling the bank accounts of their several owners.

You may have been wavering in your choice between two or three places, and the length of your stay at one or all, or the expense attendant at each place. You may have had it in mind to visit Washington, Hawaii or Paris, and but for the fact that you knew you would miss your calculations and be out of your sphere, and not enjoy your vacation, you would be there *on dit.*

You would meet so few people there who were of your set, or with whom you were acquainted, or who had any interest in common with you. Before you decide where you will spend your vacation, make up your mind to go to the National Association of Brickmakers, at Detroit, Mich., Feb. 5-10, 1900. Those having that matter in charge have arranged for your coming, and hope to have you there to enjoy their hospitality and profit yourself, and do good and get all the good you can out of the meeting. They want you to come and make your stay among them agreeable and enjoyable. They have determined to enjoy themselves and get all the good there is possible out of the meeting, even if you don't come. They know that they will be the gainers and you the loser if you remain away. It is pretty well understood that you have been hard at work for the past year or more, and have been struggling with all of the puzzling problems of brickmaking; and, if they can secure your presence at the Convention, they are ready to enter into an argument with you, or secure some one who will, on either side of the question, "Whether it were better to make bricks at the least expense, or sell them at the largest profit."

Go. Take your ideas on brickmaking and clayworking along with you, and air them. You will be allowed to retain them and take them back home again. You may be able to borrow some new ones of your fellow-craftsmen; most of them are willing to loan theirs, or exchange; a few have ideas for sale; sometimes it pays to purchase when you need the commodity.

A glance at the programme is sufficient to interest you, and the dissertations and arguments on all of the topics will certainly be profitable to those who attend. H. BRIX.

WILL KEEP OPEN HOUSE.

The American Blower Co., Detroit, Mich., wish it understood that they will keep open house to visiting brickmakers during the week of the Convention. Their factory is the best located and equipped concern of the kind in the country, and they will be very glad to have those attending the Convention pay them a visit and go through the entire establishment. The Brush street car, which passes the City Hall, comes right to the door of the factory and stops, so there is no danger of visitors being carried by. It takes but twenty minutes to reach the plant, starting from the City Hall. They are the inventors and manufacturers of the "A. B. C." brick dryer (see back cover page), which may be seen in operation at Clippert Bros.' new plant if it is running at that time. If it is not those who are especially interested in drying brick can learn all about the A. B. C. process by visiting the factory where the apparatus is manufactured.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Chicago Clay News.

Editor THE CLAY-WORKER:

That 1899 proved a record-breaker is not to be questioned. Building operations are practically at a standstill, and not in ten years have the material men and contractors contended with difficulties such as presented by the year 1899.

For the week ending Dec. 30, 1899, the number and value of building permits was less than any week in the history of the building department; while in numbers the buildings for the year are less, the quality is far above the average in advanced ideas of construction.

It is conceded that the labor problem has been the cause of remodeling old buildings, rather than tear down and rebuild, another straw that should be of some benefit to the labor leaders.

In December, owing to the efforts of Mr. M. B. Madden, W. H. Alsip and other material men, a conference was arranged between the labor leaders and contractors, with the result that committees from each, with power to act, were appointed, as follows: For the unions—Geo. P. Gubbins, bricklayers and stonemasons; O. E. Woodbury, carpenters; Herman Lilien, hodcarriers; M. B. Madden, steamfitters; Wm. E. Edwards, plasterers; J. C. Lynch, plumbers; Jos. Sullivan, stonecutters. Representing the contractors were: T. A. Dungan; masons; Jas. A. Miller, iron and metal workers; T. C. Boyd, plumbers; John Rawle, cut stone; Robert Vierling, structural-iron workers; E. M. Craig, steamfitters; W. F. Behel, carpenters. After numerous meetings an agreement was formulated, which, if observed, seals the fate of the sympathetic strike. It provides for an arbitration board of five members each from the contractors and unions, with an eleventh man selected as each case comes up. When a misunderstanding occurs it must be disposed of at once. A strike cannot be called before the contractor appears before the board of arbitration and makes a full statement of his case. By the decision of the board all must abide. The contractors' representatives handled the walking delegate rather gingerly, as though he were loaded and liable to go off at any minute. The quick action of the committee, they feel, will abridge the usefulness of the walking delegate. As to the position of the unions in regard to labor-saving machinery and the amount of work to be done in a day, they did not probe very deeply, suggesting merely a modification of their rules. The agreement is fair (and therein lies its weakness), and now awaits ratification by the different unions and associations. If this is done, there is a fair prospect for the building trades to recoup from the effects of 1899.

Paving brick received a set-back in the action of the South Side Property Owners' and Business Men's Association, with the aldermen of the several wards interested, at a meeting held the 6th inst., when it was decided to pave about one hundred blocks with a uniform pavement, and their decision was for asphalt. Their ability to judge as to the utility of brick for paving purposes is, to my mind, as acute as that of the genius who has discovered millions in the canal bank, and would pave the streets of Chicago with common brick, lime and all, at $6 per thousand. This would be an innovation, and all that would be necessary to complete the picture would be to have the Chicago engineer superintend the job. The article is "fathered" by the Chicago Daily News of Jan. 5, and I give it in its virgin ignorance. It may also be a pointer as to why all of the paving-brick manufacturers are not good Christians:

"A Chicago engineer, who has been making some calculations on his own account, estimates that out of the millions of tons of earth which have been excavated in the digging of the drainage canal clay can be got to make bricks enough to pave every thoroughfare within the limits of the city. He bases his figures on the work done by the contractors, and asserts that out of the twenty-eight miles of channel dug there are at least four and a half miles of good blue clay available for commercial purposes.

"Piled along the sides of the canal are huge mounds of the slatish-hued earth, which rise alongside of the waterway like miniature mountain spurs. These immense banks contain no less than 1,378,000 yards to the mile, or a trifle over 6,201,000 tons in all.

"This deposit, the investigator says, could be turned into first-class brick, and as owners of ovens assert that it requires but two and a quarter cubic yards of clay to manufacture 1,000 brick of the dimensions of 8x4x2 inches, out of the heap of clay no less than 2,925,000,000 rectangular cakes could be made. And as good bricks now bring an average price of about $6 a thousand, the crude article just as it lies, where the massive steam shovels have thrown it, represents in brick value the sum of $17,550,000. It is said that 3,000,000,000 bricks would pave 2,340 miles of street. This is how the statistician figures it:

" 'We'll say that the roadway is thirty-three feet wide and the paving four inches deep. On that basis it would require eleven cubic feet of brick to pave one lineal foot. It follows that if one cubic yard of clay will pave one lineal foot of street, it would take approximately 5,000 cubic yards of clay to pave a lineal mile on a street of that width. So, if it would require that quantity of clay to pave a mile, 11,738,000 cubic yards, or the dimensions of clay which has been excavated, would pave the number of miles stated. In my mind there is no question that at some future time, I sha'n't attempt to predict when, some enterprising genius will take hold of the matter and use that which seems now to be a valueless heap of rock and earth.' "

The annual election of officers of the Builders' Club was held the 8th inst., and the following were elected: W. D. Gates, president; S. S. Kimbell, vice president; E. W. Sproul, second vice president; C. W. Gindele, treasurer; T. D. Whitney, Frank J. Johnson, Julius J. Pleas, Edward Kirk, John C. O'Connell, Jas. A. Hogan and A. W. Beidler, managers. Immediately following the election the board of managers convened and elected Edward Kirk secretary. Since the death of former Secretary Scribner Mr. Kirk has discharged the duties of the office in a manner highly creditable to the club, and his permanent installment is a fitting recognition of his value to the organization. The report of the retiring board of managers is a credit to the club as well as to themselves. The organization has passed from the experimental stage and can now be classed among the foremost of Chicago clubs.

The American Terra Cotta and Ceramic Company proves its ability to "keep up with the procession" by its removal from the Marquette Building to commodious quarters in the Chamber of Commerce Building, and as a home for the building and supply interests this building has no equal. Occupying the site of the old Board of Trade Building, and still wearing the original dress of the old building to the third story, it is permeated with the old trading spirit of early Chicago, but, instead of the cereals, with the mercurial temperament of the market to make and unmake fortunes, we have now the substantial diversified trades, as solid as the building which shelters them. Thirteen firms represent the brick trade, pressed and common; nine for stone, crushed stone and lime; eleven lumber manufacturers and dealers; seventeen general and paving contractors; five cement and plaster; five terra cotta, fire brick, sewer pipe, etc., and five trade organizations, including the Builders' Club and the Builders' and Traders' Exchange.

Sixty-five firms in the construction line, and a rendezvous for nearly 350 members of the several associations, is a record of which the management of any office building would be envious. That each and every one of them may pay their rents promptly from the profits of the new year is the wish of

VERITAS.

NOTES FROM TIDE WATER, VA.

THE CLARKE-MONTEVILLE CO., a new firm recently located here, have burned their first kiln of brick, tile and hollow building blocks. These were burned in a common clamp kiln, as they were making them to build a drier and down-draft kilns with. They had two hundred thousand in the kiln. They expect to begin work on the drier and kilns early in the new year. The parties interested in this concern are from Alger, O. They expect to make drain tile and hollow building blocks mostly. The plant is located six miles below Suffolk, on the Nansemond river.

The Suffolk Clay Co.'s new plant is about completed, and they expect to start up in full force Jan. 1. They have completed their new drier, which was built by Mr. George W. Sharer.

They are now heating it up to dry it out. The machinery is all ready for business, and had a trial run a few days ago, which proved very satisfactory. The output will be 25,000 brick per day, and they expect to make drain tile and hollow building block and street paving brick enough to supply the demand in this vicinity. They have already put in the machinery for the manufacture of these articles. This will be one of the largest plants of this kind in this State.

This has been one of the best brick years in eight years in this section, and this has caused many people with more money than brickmaking sense to start new yards. I think when the relapse sets in they will wonder what they are thinking about. We have five new plants this year where the old yards for the past eight years could hardly sell their output at a very close figure.

I was very agreeably surprised to have Mr. Louis H. Gibson, associate editor of "The Clay-Worker," call on me a few days ago. I was very busy at the time, and, not knowing the distinguished gentleman, I did not greet him with the courtesy due him, yet I got acquainted with him, and we had a very pleasant time together. I can assure him if he ever calls this way again I will make it very pleasant for him as long as he wishes to stay. I hope some day to have the pleasure of entertaining the editor, Mr. T. A. Randall, himself.

All the summer yards have closed for the season with a very small supply on hand. Some of them have no brick at all to carry over.

The Nanesmond River Brick and Tile Co. expect to put in a new drier and machinery this winter. I was talking to Mr. Sturgeon, the general manager, a few days ago, and he said they would possibly put in a steam drier. The machinery they have not yet decided on.

The A. C. Larson plant will hardly run next season, as the manager told me a few days ago there was no money in it for him, and he preferred working for some one else at a salary rather than work for himself for nothing.

H. L. JACOBS.

THE NEW YORK BRICK MARKET.

THE CLOSE OF 1899 is near at hand as these words are written, and the wish of a happy New Year will soon be heard. Will it be a happy year to the brick manufacturer? We cannot look into the future, and it is well for us that we cannot. The past we know, and can give an opinion upon the happiness of the brickmaker so far as the returns to him from his investment in the business of the year past.

Happy? Yes; why should he not be? He has had paying returns for his stock, after years of patient waiting and struggle, seeing his clay bank getting smaller, his plant requiring repairs, and the net cash returns were so small, if in some cases any, it must make him happy to be able to once more have a few dollars that he can call his own. The tide water brickmaker has not received the amount of money for his stock the past year that he should. With the strength financially he now has, they, as a body, should try and formulate some plan for the coming year whereby there should be a far better price paid by the consumer for their stock.

—The Demand for Brick—

Was unprecedented in the annals of the trade and the returns of the same nature, as compared with the call for stock. To have the price of brick drop below five dollars when the market was taking all stock as fast as it was coming in would, in any other line of trade, call for a close inspection of the reason why the price was falling instead of going up. I'm afraid they, like Ephraim, are "joined to their idols" and will be content to accept the small supply of crumbs which fall to them by favor of the buyer and be thankful and happy that it is no worse.

—The Market—

Is nothing to make the shipper want to send his stock along freely; still, it has been done. The largest demand on record for the season and the close of shipment close at hand, and, if not altogether, a partial curtailment must take place, and instead of prices soaring they move along as if they were partially frozen, if not altogether.

Haverstraw, $5.25@$5.50. Newburgh Bay, $5.25@$5.50. Hackensacks, $5.00 @ $5.22. Up Rivers, $5.12½@$5.37½. Pale, $1.50@$2.00.

Last year pale were away up; this season, like putty, away down, and with freight and commission out at $1.50 it will require a magnifying glass to see what is left.

A. N. OLDTIMER.

CHICAGO TO DETROIT.

My Dear "Clay-Worker:"

May I, through the columns of your journal, urge upon the clayworking fraternity of the United States the importance to them of attending the annual Conventions of the N. B. M. A. From the first tap of President Eudaly's gavel in Cincinnati until the last one of President Richardson's in Columbus, I have never missed a single session of one of these annual gatherings.

May I say to those who have not thus been blessed, that nothing I have ever done in connection with clayworking has been so profitable or pleasant to me. It would be difficult, perhaps, to show all this profit in dollars and cents, but there are some profits that come to us that have a value not measurable by any sordid standard.

The grand men whom I look forward to meeting with are, as a class, unequaled in the membership of any association I have ever belonged to. The location of the next Convention is central and the prospects for a large attendance are very encouraging, and after the return home of the members of the Association I am sure few will regret the time and money spent. To me the meeting of old friends will alone more than compensate for the cost of the trip, and the new ones I expect to make will be a portion of my profits. Many of us are in the "sere and yellow leaf," but none of us are too old to learn, and once a year we will grow younger. Yours truly,

Chicago, Jan. 18, 1900. D. V. PURINGTON.

P. S.—The major part of the Chicago delegation will leave via the Wabash Railroad, Monday night, Feb, 5, at 11 p. m. A special sleeping car will be attached to the train which leaves Polk Street Depot at the time named. Car will be ready at 9:30. Brickmakers coming from points North and West are cordially invited to join the party. Those who do not care to reach Detroit before Wednesday can take the same train Tuesday night at 11:00 p. m., which will land them in Detroit at 8:00 a. m. Wednesday morning. D. V. P.

A GOOD BURN IN A NEW KILN.

J. W. Carson, inventor of the Peerless kilns (see ad. on page 64), writes that he has recently opened a new down draft kiln erected for the Marion Brick Co. at their Montezuma plant, which proved one of the best burns he has ever had in all his many years' experience. The kiln contained 165,000 brick, and out of that number there were less than 500 light brick, and no soft ones at all. Mr. Butterworth, the manager of the plant, says it was the evenest burn he has ever seen From side to side and from top to bottom there is scarcely any difference. the top course being a little the hardest. Mr. Carson is much elated, and will tell his friends all about it at Detroit.

NEW ADVERTISEMENTS.

Chambers Bros. Co., Brick Machinery..... 1
Ross-Keller Brick Machine Co., Dry Press Brick Machinery.... 7
Standard Dry Kiln Co., Brick Dryers..... 10
The Burt Manufacturing Co., Oil Filter..... 51
The Buehl Malleable Co., Clay Elevators..... 59
A. C. Newton, Hoisting Apparatus..... 62
C. & A. Potts & Co., Brickmaking Machinery.....58b, 82, 83
Western Machinery Co., Brick Press..... 60
Hardin & Gray, Brick Molds..... 62
The Jeffery Manufacturing Co., Elevators and Conveyors..... 62
S. H. Alsip, Brick Kiln..... 65
M. M. Bushong, Brick Kiln..... 69
James Prangley, Brick Machine..... 71
J. D. Fate & Co., Brick and Tile Machinery..... 75
Illinois Supply and Construction Co., Brick Machinery, Kilns, etc. 76
Jas. F. Mock & Co., Brick Machine and Brick Appliances..... 76
Williams Patent Crusher and Pulverizer Co., Clay Crushers, etc. 9
H. Brewer & Co., Brick and Tile Machinery..... 78
Henry Martin Brick Machine Mfg. Co., Brick Machinery..... 79
The Horton Mfg. Co., Brick Machine and Brickyard Supplies..80, 81
American Clayworking Machinery Co., Clayworking Machinery 86, 87
C. W. Raymond & Co., Brickmaking Machinery.....52, 53
Cleveland Car Co., Brick Dryer and Dryer Cars..... 57
American Blower Co., Brick Dryer..... 92
Ohio Ceramic and Engineering Co., Brickmaking Machinery..... 92

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIII. JANUARY, 1900. No. 1.

CURRENT COMMENT.

The Clay-Worker is a firm believer in expansion. Just look at our new ads. and be convinced.

* * *

This issue will be a little late reaching our readers, but this will be quickly forgiven and forgotten when the pages are opened and the many admirable features brought to view.

* * *

The report of the first convention of the year is of itself a treat. It is full and accurate, wherein it differs from our cotemporaries. It is a foretaste of the report of the National Convention, which will be given with equal accuracy in our February issue.

THE N. B. M. A. PROGRAMME

The programme for the coming National Convention has, no doubt, been studied by all clayworkers. Those who are to read papers have not before appeared in that capacity before the Association. We were almost tempted to say that they are all new men. This, however, is not true. They are men of splendid experience and men who have been successful in their various undertakings. The rostrum of the Association is new to them, but they are not new in the business of which they will speak. From the character of the programme, the subjects to be considered and the personnel of the formal speakers, as well as the discussions which they will follow, we can promise a meeting which will be an unqualified success and will profit all who participate.

CONVENTION DISCUSSIONS.

Naturally all papers which are read before a convention, whether it be a literary society or any other body, are not of equal merit. The best papers, those of great strength, do not always provoke the most discussion. Ofttimes a masterly effort, one good in subject, matter and method, has an overpowering effect on the hearers, and they sink back only to applaud and say, "What a fine effort!" The best paper does not always bring out the best discussion. It is true that a paper with meat in it is necessary for discussion. On the other hand, we feel that if discussions had been eliminated from the proceedings of our national body that quite half the value of the literature of clayworking would have been lost.

A WORD TO SILENT MEMBERS.

If a member does not take part in the proceedings of the Convention it is his own fault. There is not a single individual who comes to the meeting who does not have something valuable to give to the other members. Hence it follows that there are none who are not recipients of valuable knowledge and information from others. The silent member is silent in the Convention hall because he wants to be, but ofttimes he is the most active in the lobby talks, where much valuable information is obtained of which no record is ever made. If these silent members would only speak out in the meeting once in a while they would leave the Convention holding it in higher esteem than ever before. They would be like the young man who made his first prayer in public. He thought it was the best meeting he ever attended. There are reasons why he felt thus. One who gives something always enjoys the more what he receives. All will not speak at once, but we hope there will be a speech from all.

CRITICISM VS. FAULTFINDING.

Every man and every body of men is benefited by honest criticism. No man and no body of men is benefited by faultfinding and scolding. Honest criticism exposes weakness and suggests a remedy. A man who tears down a house to see whether it is built well is a wanton destructionist, not a good critic. One who analyzes and finds both the strength and the weakness of an organization of men or material, one who praises what is good and suggests a remedy for what is weak, is one of the builders of the world. His criticism is constructive and helpful. The carping faultfinder is destructive, and is not a critic at all. Any body of men is under obligations to one who, in a judicious spirit, will come before it and state: "Here you have made mistakes, and here is a method of correction; here is the way to enlarge the field of your work; this is the way to do it." They may not accept all that he says, but will consider it seriously, and give him credit for honest intentions and good will. All that people expect of any man is sincerity. No matter if a man does right or wrong, the important thing is, does he believe he is right? Then he is entitled to respect. Those who find fault through cautiousness, those who attempt to tear down what others have built up, for the purpose of finding a clear piece of ground for their own pedestal, are not entitled to the respect of serious people.

THE ILLINOIS CONVENTION.

The Ottawa meeting was one of the best State Conventions that ever happened. Howbeit, there were no more of brains or intelligence than usually comes together in this body, but the right spirit was there. From start to finish it was a success. The address of welcome by the Mayor, Hon. M. T. Moloney, developed a good feeling which, followed by President Townsend's able address, started the flow of debate in good form. It was a Convention in which nearly every one felt that he had made a good trade. Each felt that he had put in his time, money and experience against that of others, and each felt that he was repaid; that the account was more than balanced. Where this is true, any transaction, whether it be in brain products or in material substance, always results in suc-

cess. The president touched the keynote to progress when he said: "No industry pushes itself. Some must push and push and keep pushing to make the wheels of commerce revolve."

THE BANQUET.

When we say that the members sat down to the banquet at half past ten o'clock in the evening and stayed together until nearly four in the morning at a "dry banquet" we indicate clearly enough that the banquet was not dry in intellectual and social interest. We are sure that in this statement we tell the story of one of the most successful banquets connected with the history of clayworkers. The material part of the entertainment consumed something over an hour. The rest of the time was given to the other feast. Not only were the formal toasts well handled, but the informal addresses of those subsequently called upon were given with a snap and vigor of old time dinner speeches. Mayor Moloney responded to the first toast, and was particularly felicitous, not only in what he said, but in the way in which he said it. The spirit which he enthused into the meeting prevailed to the end.

TOUGH ON GATES AND PURINGTON.

The banquet was held on Tuesday rather than Wednesday evening for good and sufficient reasons. Two distinguished gentlemen from Chicago came down on Wednesday, only to learn that it was all over, and had to carry back concealed about their persons the set speeches prepared for that occasion. This is sad, but we predict that the speeches will be laid aside for another meeting all right, and the clayworkers of Illinois need have no fear that the wit and wisdom these gentlemen carried with them will be lost to the world. These gentlemen do not lose anything. They have been known to find a thing or two.

OUR EXHIBIT.

The paper on this subject by Dr. A. L. Converse, at the Illinois Convention, promulgates the idea that the people generally should have some knowledge as to the importance and extent of the clayworking industry of the State. He said: "I know of no industry of such magnificent importance as our own that has come so far short of making use of all legitimate means to call the attention of the general public to the value of the industry. I believe that now is the time to make a proper use of the Illinois State Fair as the proper means for advertising our industry, for the double purpose of educating the people and creating a demand for our products." He recalls the fact that similar exhibitions have always been meagre in character. It is true that an exhibition of any material which is to be sold increases the sale thereof. Notice the displays in our shop windows. Think of the effect of great exhibitions. The Philadelphia exhibition, for instance, marked an epoch in the industrial history not only of the United States, but the whole civilized world. We can readily see how the exhibition of finished clay products in any place would stimulate trade. Say it was in ordinary building work. One intending to build has his standard of excellence raised. A pamphlet distributed relating to building brick would undoubtedly lead some to build in this material who would otherwise build in wood. Decorative possibilities could be set forth, and in other instances clay products unknown to people generally could be brought to their attention. Few of us realize how little is known by the mass of people about paving brick. Here again would be a chance for expansion. When it comes to trade we are all expansionists.

The separation of the severely technical features of clayworking in convention from that which is solely practical has worked well. The technical or scientific investigators meet in Detroit Monday and Tuesday, two days before the regular Convention. They do their work in their own way, and, in time, the proceedings will be presented to the world and prove a valuable addition to our literature. The programme of the Ceramic Association has great practical interest for the skillful clayworker. It is through the technique of clayworking that the great advancement of recent years has been made. The old "podogger" who, in times past, estimated his skill by the number of brick he could mold by hand or by his capacity as an off-bearer would to-day be entitled to the position of only a very common laborer. In early times he challenged his own admiration. It is the technical knowledge which has been injected into the N. B. M. A. which has made it possible to revolutionize the science of clayworking. The work is just begun.

WITH THE CLEVELAND BRICK MANUFACTURERS.

It was our pleasure to be present at a meeting of the Cleveland brick manufacturers recently, and to hear from them direct an account of the past year's work. The record is a very satisfactory one. The demand for brick was good all through the year, and, thanks to their local exchange, which is under the direction of Mr. C. G. Barkwill, is proving an effective means of preventing the cutting of prices. The result has been a staple market and a balance on the right side of the ledger for each of the members. It was voted to attend the National Convention at Detroit, and a big delegation of Buckeye brickmakers may be expected. We found ex-President Eggers surrounded by salesmen, who were endeavoring to secure the order for machinery, etc., for his new plant. We have not yet learned who was successful.

TRADE LITERATURE.

"THE LAMP OF EXPERIENCE" is the happy title of a new catalogue received from the Eastern Machinery Co., New Haven, Conn., which contains some of the strongest testimonial letters we have ever read. Evidently the users of the "New Haven" brick machine find it fully equal to every demand made upon it. No brickmaker can read this catalogue without feeling that the "New Haven" is a good machine to own. Excellent cuts of both the horizontal and vertical machines are shown, and their appearance goes to strengthen the good impression made by the testimonial letters. The catalogue will be mailed free to any brickmaker who will write the Eastern Machinery Co. for it.

GRATH BRICK MACHINERY and Grath Down-draft Kilns are fully illustrated in a new catalogue being sent out by the Illinois Supply and Construction Co., St. Louis, Mo. The cover is an odd, dark shade of green, and the title is printed in gold, making a very brilliant effect. Between the covers is some really very interesting matter, including a brief treatise on "Dry Press Brickmaking." Sectional drawings of the Grath Four-mold Triple Pressure Brick Press are shown and the advantages of the press given in detail. The newest thing in brick presses is also illustrated. It is a hand power machine which they think will fill a long felt want. Their brick grinding machine is shown, as, too, are both their up and down-draft kilns and coking and table furnaces, which accompanying testimonial letters prove are great fuel savers. An interesting feature of the catalogue is a plan for a dry press brick plant, showing sectional views and ground-plan. Write for copy, mentioning The Clay-Worker.

"THE STANDARD BRICK and Tile Dryer" is the subject of a very handsome little catalogue just issued by the Standard Dry Kiln Co., Indianapolis. The reading matter shows care and good taste, while the illustrations are little gems. But a few years ago such a book would have been considered a work of art, and prized as such. It is an excellent illustration of the remarkable advance made by the art of printing, due, in a large measure, to the introduction of the half-tone process of engraving. Aside from its fine appearance and pretty pictures,

the book is interesting to every brickmaker, for it tells how to dry brick economically and quickly. A copy can be had for the asking.

WE ARE INDEBTED to the Anderson Foundry & Machine Works, Anderson, Ind., for a copy of their new catalogue, which is garbed in modest brown. This is as it should be, for we Indianians are nothing if not modest. The leading feature of this little book is a cut and description of the Berg Brick Press, which they have added to their list of products. Then comes their horizontal Anderson soft mud outfit and the upright machine, which is made for either steam or horse power. Next the New Departure Tile Mill is shown in a new pose, and tile tables, disintegrators, pug mills, barrows and all manner of brick and tile yard supplies are pictured, and last, but not least, their Automatic Balance Value Steam Engine is exhibited. Our readers are requested to write for a copy and mention this paper.

THE CUTEST LITTLE booklet we have received for some time comes from S. H. Alsip, Belleville, Ill. While it is small in size, it is large in interest, for it tells about the Alsip system of kilns and kiln appliances, and as long as brick are made and burned this will continue to be a vital subject. Mr. Alsip is, himself, a successful brick burner, and his inventions are the result of practical experience and intelligent experiment. The little book contains some "Combustion Pointers" that ought to be read by every brickmaker. If interested in the burning problem, write him for a copy.

HAIGH'S NEW SYSTEM of kilns for burning all grades of brick, lime and cement is very fully described in a pamphlet received from Hervey Haigh, of Catskill, N. Y., where that gentleman is demonstrating that his system is not an irridescent dream, but a practical work-a-day fact, for he has been burning high-grade pavers there for the past two years. Those who want light on the up-to-date continuous kiln should communicate with Mr. Haigh.

PRACTICAL POTTERS declare that the Rathsam Patent Flower Pot Machine is the best pot machine made. The Rockwood Mfg. Co., Indianapolis, who manufacture it, have a series of neat little testimonial letters from users which they will very willingly mail free to any one wishing to investigate the machine.

"Transactions of the American Ceramic Society" is the title of a very neat book of 100 pages containing the papers and discussions of the first annual meeting of that association at Columbus, O., Feb. 6 to 8, 1890. The contributions are from the brightest men engaged in ceramics in this country, and are of much value. By order of the society no reference to the business transactions is given in the book, but only the papers and discussions are published. We rather fancy the idea, for it gives the reader just what he wants, and nothing more. The society authorizes the secretary to sell copies of the transactions to persons not members of the society at the same amount charged as dues for associate membership—$4. Any one desiring a copy can procure the same by forwarding that amount to Prof. Edward Orton, jr., Columbus, O.

1900 CALENDARS.

To the observing there are many trade barometers that tell unerringly of the prevailing commercial conditions. One of the many straws that to us indicate the trend of trade currents is the annual crop of calendars gathered with each new year. When business is dull and the current of trade sluggish the number of calendars diminish, and they shrink in size to small and inexpensive proportions. As prosperity returns there is a marked change, and the calendars increase materially both in number and in quality, as our present collection shows. This year's designs are rich and varied, ranging from fine lithographs to the most elaborate reproductions of noted paintings and famous scenes, executed in colors regardless of cost.

Among the first to come in was a large, handsome lithograph from the Marion (O.) Steam Shovel Co. It is the same design as that used by them last year, having for its chief motive a drawing in colors of their steam shovel, which is now known the world over. The design is so excellent that it will bear repetition indefinitely, and we are pleased to give it a permanent place in our sanctum.

The H. W. Caldwell & Son Co., of Chicago, have a new and original design. About an oval figure of a pretty girl, holding in her shapely arms a pair of cute puppies, is grouped small views of their factory as it appeared in 1875 and as it stands to-day, an immense modern manufactory, devoted to the production of elevating and conveying machinery and appliances.

D. J. C. Arnold, manufacturer of brick and tileyard supplies, New London, O., contributes one of the handsomest of the collection, being both an excellent calendar and a very pretty picture, the latter a reproduction of the painting "The Bride and the Fortune Teller." The color work of the latter is dainty to an extreme.

Elder & Dunlap, of Bloomington, Ill., manufacturers of the Perfect clay screen, pictures a bit of rural life in black and white, entitled "An Anxious Moment."

A small but very neat calendar bears the imprint of A. M. & W. H. Wiles Co., makers of soft clay brick machinery, molds, etc., of Grassy Point, N. Y.

The prettiest calendar girl of the bunch comes from the Canton and Cleveland Brick Co., Canton, O. Like the paving brick she is advertising, she is well molded and puts up a bold front.

From a utilitarian point of view, the calendar issued by the Brockway Brick Co., Fishkill-on-Hudson, N. Y., is very hard to beat. The calendar pad is large, and is suspended from cardboard, on which is printed an excellent view of that firm's brick works, with a glimpse of the picturesque Hudson in the background, and pictures of two good, square brick, one of which is Mr. Brockway himself.

One of the most artistic calendars of the season bears the imprint of W. L. Davis, pallet brick manufacturer, Berlin, Conn. From a deep dark green frame looks out an Oriental maiden, so beautiful that one never tires of gazing at her.

Another shows a face that we never tire of, that of burly William Hammerschmidt, of Lombard, Ill. We honestly believe if he could stamp the same impression on his brick and tile that they would bring a better price.

From far away New Orleans comes a pleasant reminder of the Salmon Brick and Lumber Co. This is a picture of a dog and cat, entitled "Asleep and Awake," in a frame of oak leaves and acorns.

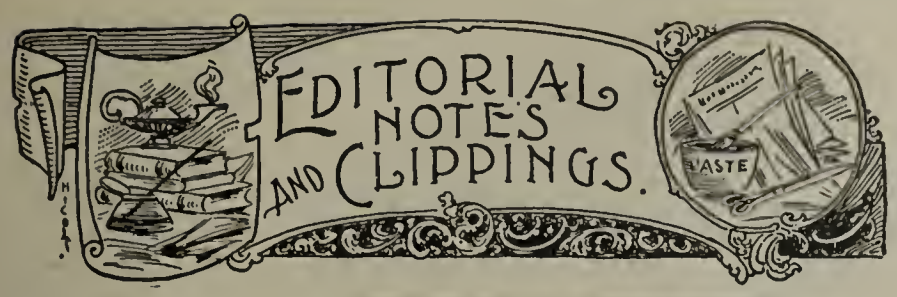
The Standard Brick Co., Berlin, Conn., pallet brick manufacturers, contribute one of the best of the collection, the picture feature being a reproduction of the oil painting "Under the Willows."

Another and a similar one comes from the First Avenue Brick and Tile Co., manufacturers of brick and tile, Evansville, Ind., on which is portrayed a sweet little miss "Writing to Papa." Mr. Kleymeyer, the secretary and treasurer of the company, is expected to attend the National Convention at Detroit, and we trust that if he cannot bring her with him he will leave some one at home who will perform this filial duty.

A beautiful picture entitled "Heart's Secret" bears the imprint of the Frost Manufacturing Co., Galesburg, Ill. It is so pretty that it seems wrong to make an advertisement of it, and announce in cold type that it is but the herald of their famous dry pans, engines, boilers and elevator machinery.

OBITUARY.

We are in receipt of a letter from Frank B. McAvoy, of Philadelphia, advising us of the death of his mother, Mrs. T. B. McAvoy, which occurred at her home, near Philadelphia, on the 18th, after a brief illness. Though the family is a large one, this is the first death that has occurred among them in many years.



J. A. Smith, Holly Hill, S. C., writes that he is in the market for brickmaking machinery.

G. W. Weiss writes that he expects to start a brickyard at Oklahoma City, Okla. T., in the spring.

Maurice J. Smith has leased the Carns brickyard, at Ridley, Pa., and will put in improved machinery.

The Devlin Coal Co. expect to put in a brick plant at Toluca, Ill., so as to use the waste from the mine.

The McPherson (Kan.) Republican says there is a splendid opening in that town for a good brick plant.

T. W. Moore, Palestine, Tex., advises us that he contemplates the purchase of a new brick machine.

E. L. White, 2308 Sixth street, North Minneapolis, Minn., advises us that he will start a brick plant there in the spring.

There is a good opening at Savanna, Ill., for a brick factory. Any one interested should address the editor of the Savanna Times.

J. L. Green & Son contemplate making a number of improvements and putting in some new brick machinery at their plant at Trainer, Pa.

Mrs. F. A. Warner, Pontiac, Mich., wants to purchase some miniature jugs, and will be pleased to have manufacturers quote prices, etc.

The brick works of Samuel G. Light, at Lebanon, Pa., was totally destroyed by fire New Year's day. It is thought to have been the work of tramps.

J. A. Wiggs, Jr., superintendent of the Paton Coal and Coke Co., Gardiner, N. M., writes that his firm wants to purchase a stiff mud brick machine.

The Minor Fire Brick Co.'s Works, at Empire, O., was destroyed by fire Jan. 11. The works belonged to C. B. Stowe & Co., of Cleveland, and was insured for $12,000.

A responsible party advertises in our want column, page 58, for a factory fitted up for hollow fireproofing work. A lease is wanted on such a factory for a term of years.

Joseph Hart, a leading brick manufacturer of Blair county, Pennsylvania, died at his home at Hollidaysburg, aged seventy-three years. He leaves a wife and seven children.

Charles A. Hoshour, of Clebourne, Tex., in a recent letter, states that he will put in a soft mud brick machine in the fall, and would like to receive catalogues, price lists, etc.

The W. T. Walker Brick Co., of Arlington, Va., has been incorporated by W. T., W. H., C. J., E. T., and A. L. Walker, all of Washington, D. C., and A. B. Hines, of Ballston, Va.

Thomson & Dunlop, of Duluth, Minn., contemplate starting a common brick plant at that point, and advise us that they will be glad to receive catalogues, etc., of brick machines.

Flanagan Bros., Kansas City, Mo., write that they are in the market for a good second-hand press brick machine and Steadman crusher. Their address is 816 East Fourteenth street.

A sewer pipe and paving brick plant will be established at Mogadore, O., with office at Akron. Chas. H. Palmer is president and George F. Whitmore manager of the new concern.

The Marine City (Mich.) Brick, Paint and Development Co. has been incorporated, with a capital stock of $15,000, by A. Fredericks and others. They will manufacture brick, paints, etc.

The city council of Hampton, Va., contemplate putting down a number of brick streets. J. C. Outten, chairman of the paving committee, will be glad to communicate with paving brick manufacturers.

Ernest Schoepke, Wien, Germany, desires to communicate with the firm that furnished the Weinerberger Ziegelfabriks and Baugesellschaft, of Lothringer Strasse, Wien, Germany, with brick machinery some two years or more ago. Presume

CONTINUED ON PAGE 54.

TABLE OF CONTENTS.

The Convention City..... 11
An Invitation St. Louis to Detroit 13
Modern American Front Brick 14
After Gates's Button-Hole..... 16
Ancient Egyptian Porcelain... 16
Brick Roads for Country Highways..... 17
Canton, O., Paving Brick Industry 18
Will Meet Them at Detroit..... 20
Some Costly Bits of Experience 21
Fire Brick, Their Manufacture and Uses 22
Convention of Stove-Lining Manufacturers..... 23

THE ILLINOIS CONVENTION.

A Successful Convention..... 24
The First Session..... 24
Letters from Absent Members. 24
Reports of Members..... 24
Maddigan's March..... 24
Second Session..... 27
Mayor Maloney's Welcome.... 27
Committee on Resolutions..... 28
President's Address..... 28
An Unequal Partnership 29
"Our Exhibit."..... 31
Project for a State Exhibit of Clay Products..... 32
Grate Bars or No Grate Bars.... 34
Lessons of Hard Times..... 36
From Clay Bank to Kiln..... 37
The Future Tile Business..... 38
The Outlook for Beginners..... 40
Why Burned Clay is Superior to all Other Material..... 42
The Treasurer's Report..... 43
Report of Committee on Resolutions 43
The Officers Elected..... 44
The Banquet..... 44
Menu 44
Toasts 44
The Annex and Annexers..... 45
Seeing Ottawa..... 45
List of Members..... 45
The Ohio Convention..... 46
True Philosophy—Good Business..... 46
Brickyard Sketches..... 47
To the Brick and Tile Maker .. 49a
Official Announcement..... 49c
Bugle Call "Assemble."..... 49d
Will Keep Open House..... 49d
A Good Burn in a New Kiln.. 49f

CORRESPONDENCE.

Expects the Glad Hand at Detroit 23
Pacific Coast News..... 49b
Chicago Clay News..... 49e
Notes From Tide Water, Va... 49e
The New York Brick Market.. 49f
Chicago to Detroit..... 49f
Has Had a Good Year..... 56
Prosperity in Mississippi..... 56

EDITORIAL :

Current Comment..... 49g
The N. B. M. A. Programme. 49g
Convention Discussions..... 49g
A Word to Silent Members... 49g
Criticism vs. Faultfinding.... 49g
The Illinois Convention..... 49g
The Banquet..... 49h
Tough on Gates and Purington 49h
Our Exhibit..... 49h
With the Cleveland Manufacturers..... 49h
Trade Literature..... 49h
1900 Calendars..... 50
Obituary.....50, 56
Editorial Notes and Clippings.. 51

MISCELLANY:

Worth Remembering..... 16
Wants a New Location..... 49a
New Advertisements..... 49f

Index to Advertisements on Front Inside Cover Page.

A new brick works has been started at Bartow, Fla., by E. C. Stewart. The plant, which will have a capacity of 20,000 daily, will be equipped with machinery from the shops of the Henry Martin Brick Machine Mfg. Co.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

SPILLING WATER ON A SPONGE

Don't lose it, you can get it again. Same with waste oil from the bearings. You could use it over again several times if it wasn't dirty.

THE CROSS OIL FILTER

Will clean it. Makes it just as good as ever. Saves from 50 to 90 per cent. Used in the largest Brickyards in 26 countries. Sent on approval.

—:o:—

Write for Catalogue 43.

BURT MANUFACTURING CO.,

AKRON, OHIO, U. S. A.

Largest Manufacturers of Oil Filters in the world.

RAYMOND

BRICK MACHINERY

Where it is Used.

In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

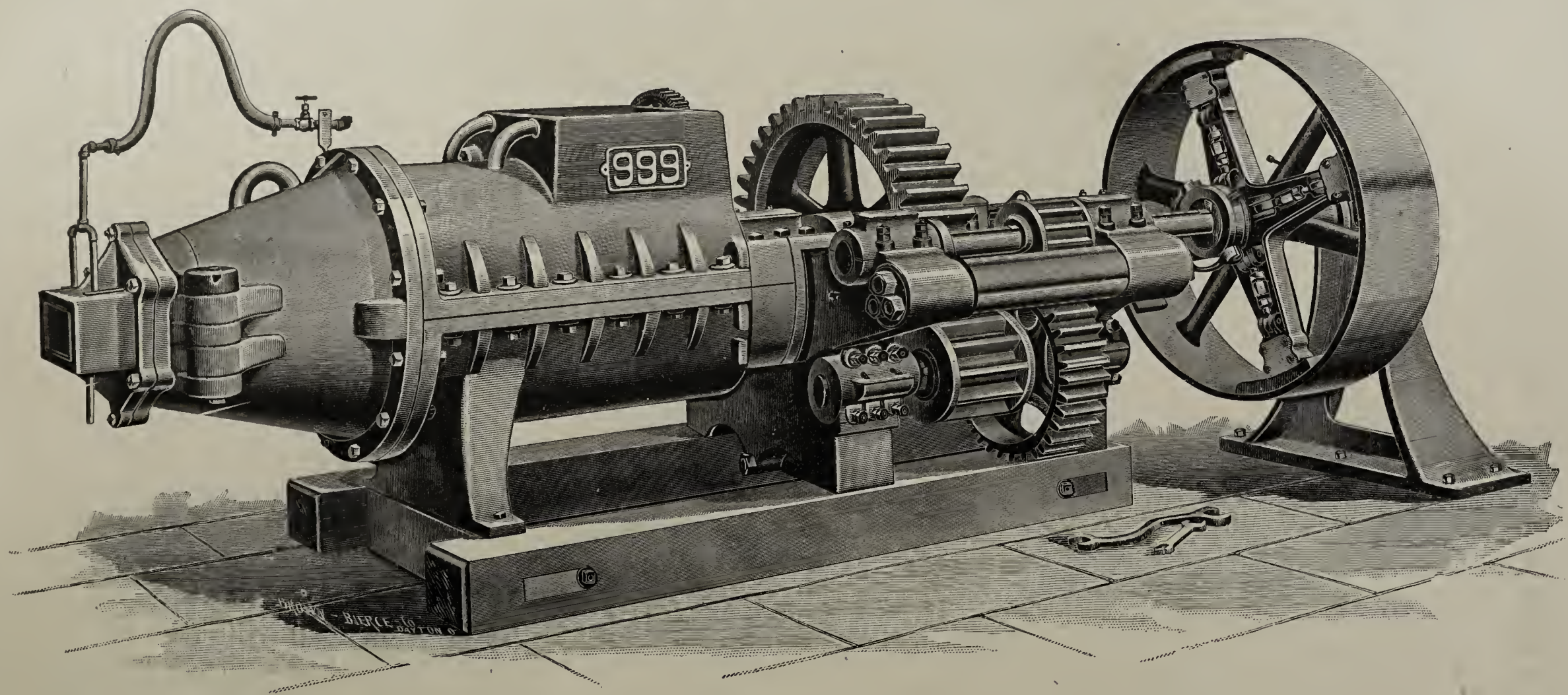
RAYMOND BRICK MACHINERY is now used and in daily operation the world over. Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine.

Our great success has not been obtained without merit. Buy Raymond's and you get the best.

The C. W. RAYMOND CO.

DAYTON, OHIO, U. S. A.

Raymonds Large Capacity Brick Machine.



"Looks are nothing, behavior is all," is just as true of brick machines as of mortal clay. The above cut shows that our 999 machine s a good looker, and in operation it is even better than it looks. The very embodiment of strength, it is he machine for those who want to increase the capacity of their plant, while for the making of paving brick from tough shales it is par excellence. Its great power makes it possible to make good pavers from shales that can not be worked successfully in ordinary auger machines. This machine has many good points which we will gladly enumerate in detail to every brick maker who is interested. Address,

We also make a variety of superior Represses, Cutting Tables, Clay Crushers, Pug-Mills, Tempering Wheels and all kinds of Brick Yard Supplies.

Write for new Catalogue.

The C. W. Raymond Co.,

Dayton, Ohio, U. S. A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

Mr. Schoepke is in the market for brick machinery. His address is No. 4 Deutschmeister Platz.

The Los Angeles (Cal.) Brick Co., has been incorporated. The directors are W. F. Botsford, T. E. Newlin, J. F. Sartori, M. H. Newmark, George W. Beck, M. S. Hellman, Samuel M. Newmark. The capital stock is $500,000.

A. C. Ochs, Springfield, Minn., in a recent communication, says he will start a branch brick and tile yard at Heron Lake, Minn., with head office at Springfield. He thinks he has an excellent quality of clay for both brick and tile.

Gordon Peck, of the firm of T. G. and G. H. Peck, brick manufacturers of Haverstraw, N. Y., has gone to Cuba with a view of investigating the brick industry there. If the prospects are favorable, he will establish a brick plant in that country.

The McAvoy Vitrified Brick Co., Philadelphia, Pa., whose works are at Perkiomen Junction, Pa., have recently booked an order for 4,000,000 paving brick to be shipped to Havana, Cuba. They expect to be able to make the shipment by March 1.

A brick plant of 25,000 daily capacity will be established at Colfax, Md., by the Colfax Red Brick Works, of which T. B. Williams will be general manager. After they are well started they will take up the manufacture of street pavers and fire brick.

Frank Rudy, McMechen, W. Va., writes that he is trying to interest parties with him for the purpose of starting a brick plant at that point. He says that there is a good opening there for such a plant and he hopes to have one in operation by spring.

Rosignol & O'Keefe, brick manufacturers of Augusta, Ga., have had a very successful year. They have made a number of improvements in their plant, and have recently closed a contract with the C. W. Raymond Co., of Dayton, O., for one of their large brick represses.

E. Arnold, McMinnville, Tenn., writes that he is thinking of changing from the soft mud to the stiff clay process. He had a good year during 1899, with prices at $6.00. All face brick used at McMinnville are shipped there from Nashville, at a cost of $13.00 per thousand.

The Chronicle, of Laporte, Tex., says that the farmers in that vicinity are all anxious to try tile drainage, and that there is a good opening in Laporte for a tile plant. It is said that enough advanced orders can be secured right now to justify the establishment of a tile factory.

The Wittmer Brick Co. have sent out a card announcing the removal of their office from 12 Federal street, Allegheny, Pa., to 1309 Park Building, Pittsburg. In common with the other brick manufacturers of the Smoky City, the Wittmer Brick Co. has had a very successful season.

The Central Brick Co., a new firm at Pittsburg, Pa., has just completed the erection of what they consider one of the complete brick plants in the country. Mr. Carl Kapple, president of the company, says they will make ornamental front brick and telegraph wire conduits.

J. B. McHose, proprietor of the Boone, (Ia.) Clay Works, has purchased forty acres of land adjoining the plant and will make improvements that will double the capacity the coming season. The improvements will consist of a new engine and boiler, new kilns and improved machinery.

The Brick, Terra Cotta and Supply Co., of Corning, N. Y., have been making several extensive improvements in their plant. Among them, new screens have been put in and the brick department remodeled generally. They are now also adding a large pressing floor of over 4,000 square feet to the terra cotta department.

In renewing his subscription to "The Clay-Worker" George E. Derry, La Prairie, P. Q., Canada, reports that business has been good in and around Montreal the past season, the price being from $6.00 to $11.00. He says the prospects are good for next season, as by the time the brickmakers begin work there will be no stock on hand.

In a recent communication renewing subscription to "The Clay-Worker," David C. Meehan, secretary and general manager of the Columbus (O.) Face Brick Co., says: "'The Clay-Worker' is one of the most welcome visitors to our office. We could not get along without it."

The Eastern Paving Brick Co., Catskill, N. Y., through the agency of C. A. Wardle, recently purchased about eighteen acres of contiguous clay lands, just west of the West Shore railroad station here. The lands were owned by John Hardwick, Wm. Marquit, E. E. Adsit and Adam Steiner. This is a fine addition to the property of the shale-brick company, and in early spring a switch will be built from the Catskill Mountain Ry. to the clay beds, which are about a mile distant from the brick plant.

The Ittner Brick Co. has been incorporated by Anthony Ittner, Henry C. Spore and Ben F., Geo. W. and Warren W. Ittner, the three latter being sons of Anthony Ittner. The officers are Anthony Ittner, president and treasurer, and Henry C. Spore, vice president and secretary. They have a capital stock of $100,000, all paid up.

The Orangedale Brick & Trading Co. write that the new plant they are putting in at Orangedale, N. S., is but sixty miles from Sidney, where the Dominion Iron and Steel Co. have a successful brick plant. They have excellent clay, and, when fully under way, will have a daily capacity of 40,000. They are putting in a complete Potts equipment.

The board of directors of the Montello Brick Co., at Reading, Pa., have decided to erect a large brick manufacturing plant at Wyomissing, Pa., which will have a daily output of 100,000 bricks. The company has had plans prepared for this work, and also for an addition to their present plant, which will increase the latter's capacity 25,000 daily.

A terrible dust explosion occurred in the coal shaft of the Cayuga Press Brick Company, at Cayuga, Ind., Dec. 17. The cage was blown out and two miners injured, one, Henry Thomas, probably fatally. Thomas inhaled the flames. A number of miners were at work in the shaft when the explosion occurred, and they had narrow escapes from being injured.

Our Southern correspondent advises us that the brick business in the sunny Southland was more than brisk during 1899. He says "none of the yards have a large stock on hand, and most of the season's output is already sold. All brickmakers are preparing for an enlarged output next season, and orders are now being booked for brick to be delivered early in the spring.

In a recent letter Walter Clark, of Clark & Allston, Clarksdale, Miss., write that they have had a very busy season, both in brick and tile. Mr. Clark thinks there is a splendid future for the tile manufacturer there, as the farmers of that section are now investigating farm drainage. Mr. Clark says he will be at the Detroit Convention sure. He joined the Association last year at Columbus, and says he will never willingly miss another meeting.

In renewing subscription to Clay-Worker for 1900 H. Fenn, manager of the Taylor (Tex.) Brick and Cement Co., writes that his company is erecting a fine brick plant and cement works at Taylor. He says they have a very fine deposit of shale, which is seventy-five feet deep, and beneath this shale is found pure Roman cement. The plant will be ready for operation early in February and have a daily capacity of 40,000 brick and ten barrels of cement.

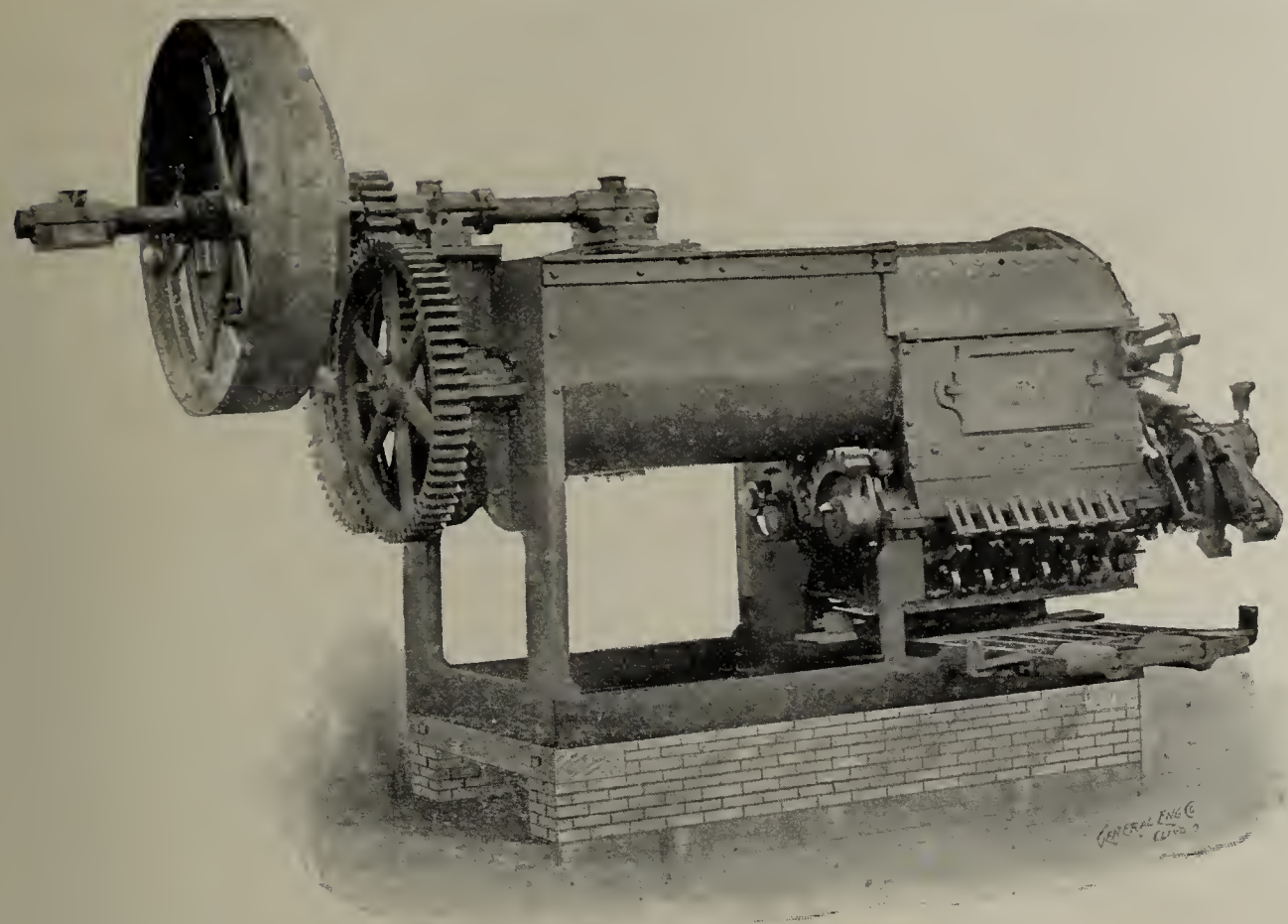
T. W. Carmichael, Wellsburg, W. Va., manufacturer of the Carmichael clay steamer, reports the following recent sales: One clay steamer to Lincoln Fire Brick & Shape Co., Pittsburg, Pa.; one clay steamer to M. Butler, Houston, Tex.; one clay steamer to Lac du Bonnet Mining, Manufacturing & Developing Co., Winnipeg, Man.; one Carmichael clay screen to Lac du Bonnet Co.; one clay steamer to Acme Brick Co., Marietta, O.; one clay steamer to Royal Fire Brick & Sewer Pipe Co., Akron, O.; one clay steamer to Gem Brick Co., San Antonio, Tex.

The Washington Brick and Lime Co., of Spokane, Wash., who are now operating a very successful brick plant, will establish another brick plant at Clayton, Wash., and also a large sewer pipe works at the same place. They say the demand in that section for brick the past season was unprecedented. In fact, there was a brick famine, and it is to prevent anything of this sort again that the new plant, which will have a daily capacity of 30,000, is being built. Both the sewer pipe and brick plant will be ready for operation in the early spring.

The employes of the Evens & Howard Fire Brick Company's works, at Cheltenham, St. Louis, Mo., gave J. H. Steedman, until a short time ago the general manager of the company, a substantial token of their esteem and appreciation in the shape of a gold fob of unique design. It was presented with a hearty expression of good wishes by Frank G. Evatt, superintendent of the company's terra cotta department. Mr. Steedman, who is vice president of the Curtis Manufacturing Company, will hereafter devote himself exclusively to the intersts of the concern.

The Brick Contractors' Association of this city gave a banquet to the brick manufacturers and supply men of that vicinity at the Seventh Avenue hotel recently. About 120 men were present. Besides partaking of a sumptuous repast, they were

[CONTINUED ON PAGE 56.]

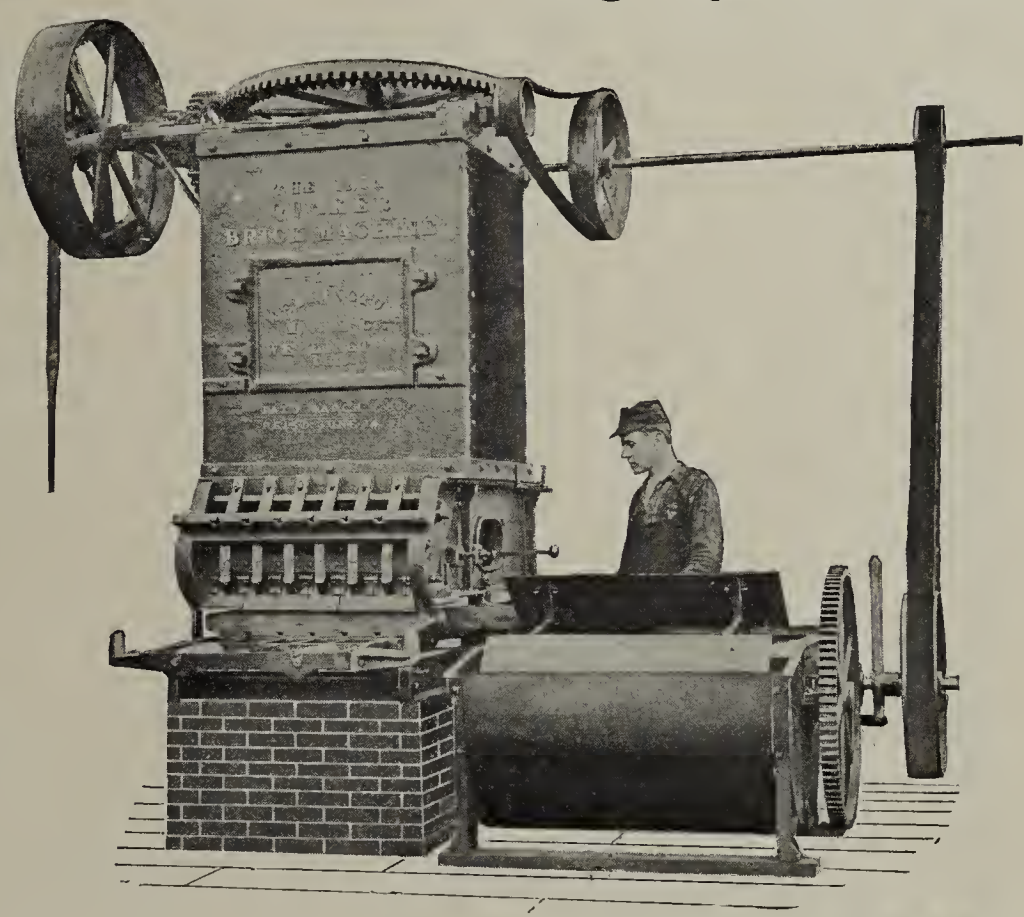


Over 75 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

Long acknowledged the best for small and average sized yards.

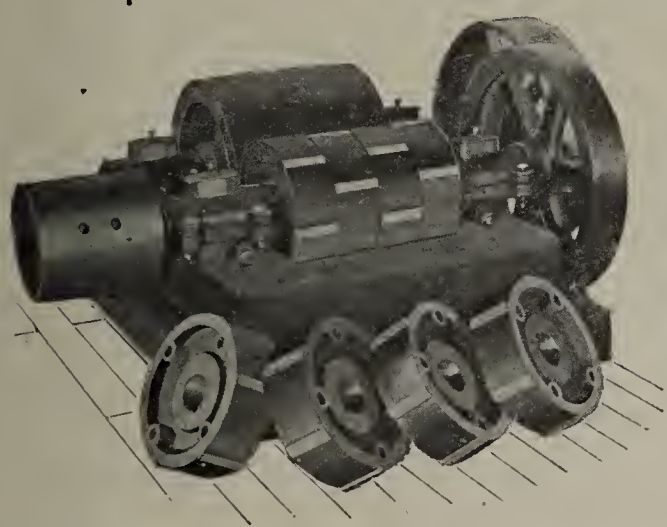


FOR 1900

We have added several new machines to our line.

Send for our 1900 Circulars.

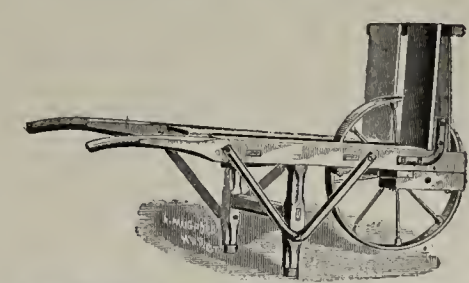
Our mould-sander is the best, simplest and cheapest.

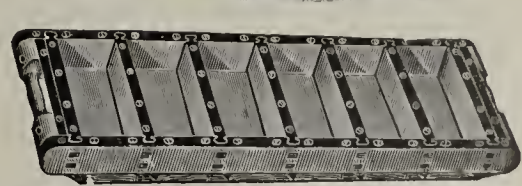


TWO Styles of Disintegrators, Solid rolls with inserted cutting bars and cutting roll made of hard sections.

MOULDS, TRUCKS, BARROWS,

and all other Supplies.





Nothing runs easier than our BALL-BEARING BARROWS AND TRUCKS.

The WELLINGTON MACHINE CO.,

WELLINGTON, OHIO.

EDITORIAL NOTES AND CLIPPINGS—Continued.

entertained by the Masonic quartet and by a number of vaudeville performers selected from the various theaters. James White was toastmaster of the occasion. H. H. Frances toasted the brick manufacturers, and the reply was given by George Albertson, of Booth & Flinn. John S. Todd toasted the supply men, and the response was delivered by J. S. Haas, of Houston Bros.

A party of Cleveland and other northern Ohio gentlemen, in connection with some Indiana bankers, have recently purchased the most wonderful tract of marl land yet discovered in this country. This body of marl land consists of about one thousand acres, located at Milford, Ind., at the junction of the Baltimore & Ohio and the Big Four systems. The marl is of unusual purity and depth, and has been found to produce the highest grade of Portland cement. A company has been organized with strong people in it, and plans have been made for a mill having the largest capacity in the West. The securities of the new company have been largely spoken for, and subscription books will soon be open. It is understood that Cleveland gentlemen of large experience will be in control.

OBITUARY.

Wm. McGinnis, a veteran brick manufacturer of Glasco, N. Y., died there Dec. 22. Mr. McGinnis was ninety-one years old, and was actively engaged in the brick business up to the day of his death. He was probably not only the oldest man in the brick business, but had probably been in the business longer than any other man in the United States, having first commenced making brick in 1834. In commenting on his death a local paper says: "He was a man of pleasant and affable disposition and was a benefactor to the place in which he resided for so many years. He was a self-made man, one who accumulated a competence through persistent energy and unremitting toil, working industriously to win the success which crowned his effort."

Edward Harland, one of Chicago's old settlers, died at his home in that city Jan. 13. He was born in Richmond, Yorkshire, England, Oct. 25, 1832, and moved to Chicago in 1855, where he has resided ever since. He was the first man to make brick from the clay taken out of the Ogden canal at Goose Island. In 1860 he went to Pike's Peak, having caught the gold fever, and on his return built a brick manufacturing plant at Elston avenue, near Fullerton avenue. Mr. Harland had been engaged in brickmaking longer than any other man in Chicago. He was for many years a partner of the late Thomas Moulding, and afterwards organized the Harland Brick Co., with which he was actively engaged until the day of his death. Four sons and three daughters survive him.

Ward H. Dean, superintendent of Dean Bros.' Steam Pump Works, of Indianapolis, Ind., died at his home Jan. 3. Although he had been in poor health for a number of years, he was only seriously ill a few days. Mr. Dean was born in 1850, and moved to Indianapolis in 1870, and has made this city his home ever since. He was superintendent of the Dean Steam Pump Works all these years, and was noted for his inventive genius and originality in design. He was quick to discern character, and relied greatly on his own judgment, being rarely deceived in his estimates of men. His genial nature made him companionable to all who knew him, and the men of the works, with whom he was in close touch and sympathy, liked him well. He leaves a widow and two children, a boy of twelve years and a boy of eight years.

HAS HAD A GOOD YEAR.

Dear Randall:

I inclose you $2.00 to pay my subscription for The Clay-Worker for the coming year. I could not be with you this week at Ottawa; was very sorry, but it happens that sometimes a man must stay home—that is, if his wife says so—and as it happened, we received a new boarder yesterday, another tile and brickmaker. This makes six boys, so we will soon have enough to run our tile and brickyard with our own help.

We had a good year. The best business was in tile, only the price of tile was too low, and we hope they will advance with all other material. We have sold all our brick; may have 25,000 left when we have made all our deliveries.

I will try to attend the National Convention at Detroit if possible. If not I will send you the $3.00 membership fee.

Very respectfully, WM. HAMMERSCHMIDT.

Lombard, Ill., Jan. 13.

PROSPERITY IN MISSISSIPPI.

Publisher CLAY-WORKER:

Yours to subscribers received. I am well pleased with The Clay-Worker; have found it very useful to me during the year. Please find check for $5, to pay subscription and also for a copy of Brickmakers' Manual. Please send book at once, as I am in need of it just now.

Our company has had a fairly prosperous year. We are now putting in a new plant out and out, with a capacity of 30,000 per day. Would like very much to attend the National Convention, but will not be able to do so this year on account of press of work.

Wishing you the greatest success in your work, I am, respectfully, yours. T. J. HARVEY.

Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — A party with about $8,000 to take a half interest in a soft-mud yard. Address O. V. PAYE,
12 4 c Station "C," Los Angeles, Cal.

FOR SALE—Forty acres of ground and the only clay in or close to Centralia for making a first-class brick, is operated as a hand yard. Good dwelling, barn and other improvements. Address HOLD, care Clay-Worker.
1 1 c m

WANTED -- Position as superintendent or burner in a dry-pressed-brick yard, by one who thoroughly understands the business in all its departments; 15 years' experience; best of reference. Address C. H. L.,
1 1 cm Care Clay-Worker

FOR SALE—200 acres coal land, six foot vein, two mines open and operating, equipped with half mile switch to main track, surface under cultivation, situated in Eastern Illinois. This land has also a strata of fine clay suitable for paving brick manufacture; some of the finest paving brick in the country having been made from it. Will sell coal and clay interests together or separately. For particulars apply to DR. JOSEPH FAIRHALL,
1 3 c m Danville, Ill.

FOR SALE CHEAP—One large size Iron Pug Mill, has been used very little, good as new, made by E M. Freese & Co., of Galion, Ohio. One Crusher in good running order, made by H. Brewer & Co., of Tecumseh, Mich.
Address
WARREN BRICK & TILE WORKS,
1 3 c Warren, Mich.

FOR SALE.

One Frost 9-foot dry pan.
One Frey-Sheckler pug mill No. 2, open top.
One Frey-Sheckler side-cut board delivery.
One Eureka vibrating screen.
One Potts 24-inch double roll disintegrator.
One Raymond single die power perfection repress.
One extension off-carrying belt, 12 feet long.
Reason for sale, changed plant from dry to wet process. Address
DIAMOND VITRIFIED BRICK CO.,
1 2 dm Portland, Ore.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.
PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.
SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH,
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 1 2 cm

FOR SALE — One Raymond brick machine and cutting table, Raymond iron pug mill, both good as new; two Raymond power represses, two hand represses, iron and wood pallets, two Frey-Sheckler power represses, two Frey-Sheckler clay cars, six Spring brick trucks, one Chambers brick machine and automatic cutting table, one Monarch soft mud brick machine and sander.
These are all in good condition, and will be sold very cheap. Write at once for better description.
SUBURBAN BRICK CO.,
1 1 cm Wheeling, W. Va.

LARGE PLANT FOR SALE,

A large brick plant, making soft mud and dry press brick, situated in a growing city of 45,000, within one mile of court-house. The plant is equipped with the latest and best machinery, including Simpson dry press machine, Potts all-iron machine, sander and disintegrator, 12-track Standard dry kiln, latest improvements, 204 steel rack cars, etc., 75 H. P. engine, 2 steel boilers, 75 H. P. each, installed within a year, Eudaly down-draft and Wingard up-draft kilns, 42 acres of land; everything in first-class running order. Large established business of over 18 years' standing. Orders already booked for early spring trade. Owners desire to retire on account of old age and other business interests. Will be sold at a big bargain. Address A. K. A.,
1 1 dm Care Clay-Worker.

Continued on page 58.

The BUCKEYE Kiln Brick Dryer.

Built upon the same Principle as a Down Draft Kiln,

NO STEAM PIPES,
NO REPAIRS,
NO SMOKE,
NO GAS,

UNDER PEFRECT CONTROL,
HIGH TEMPERATURES,
RAPID DRYING,
BONE DRY BRICK.

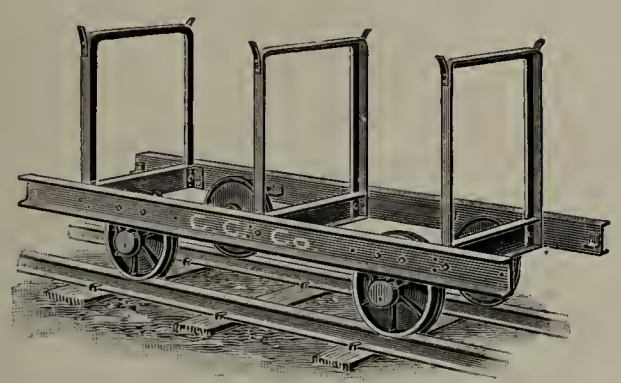
PERFECT COMBUSTION,

Insuring the Greatest Possible Degree of

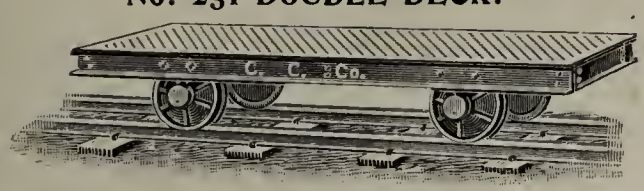
ECONOMY.

Can be applied to any Drier.

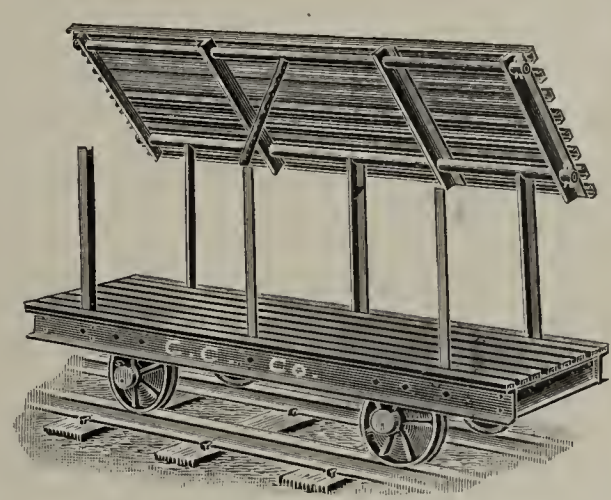
Can be worked in connection with the utilization of waste heat from cooling Kilns.



No. 231 DOUBLE DECK.



No. 214 SINGLE DECK.



No. 232 DOUBLE DECK, with Steel Decks.

A FULL LINE OF ALL STEEL DRYER CARS.

CLEVELAND CAR COMPANY,
Cleveland, Ohio.

FOR SALE, WANTED—Continued.

WANTED — 100 second-hand brick drying cars for tunnel dryer.
EVENS & HOWARD FIRE BRICK CO.,
1 1 d St. Louis, Mo.

WANTED — Position of superintendent in brick or fireproofing terra cotta; have had long experience. S. M.,
1 1 d Care Clay-Worker.

WANTED — Work in a terra cotta works, by one used to modeling and model making. C. W.,
1 1 d Care Clay-Worker.

WANTED — 1,500 iron pallets in good condition. Address
THE CAMBRIDGE BRICK & TILE CO.,
1 1 d Cambridge, O.

WANTED — One good pressed brick setter and sorter, and one good sorter and brick handler. Address
1 2 dm L., Box 23, Lehigh, Ia.

WANTED — A plastic clay that will burn pure white, suitable for wall tile. Address "TIF,"
1 1 c Care Clay-Worker.

FOR SALE — One 2-mold Boyd press; good as new, with five shaped molds; cheap. Address L., Box 23, Lehigh, Ia.
1 2 dm

WANTED — Position as foreman of a shale paving brick plant or brick and tile plant; twenty years experience; can furnish the best of reference. Address
N. M., care Clay-Worker.

WANTED — First-class salesman to sell paving and building brick; prefer party living in western part or middle of Pennsylvania. Address PHILA,
1 1 d Care Clay-Worker.

WANTED — A small ware turner; must have good references. Write to
LOS ANGELES STONEWARE CO.,
423 W. Ave. 26,
1 1 d Los Angeles, Cal.

FOR SALE — 8,000 brick pallets, half-inch poplar, 33x10, three strips; in good condition; will sell cheap. Address
J. R. CRAVEN,
1 2 cm Walton, Boone Co., Ky.

WANTED — Position as superintendent of brickyard using Chambers Bros. machine; 10 years' successful experience; good reference. Address A.,
1 1 cm Care Clay-Worker.

WANTED — A position with a terra cotta architectural works; by one used to drawings; has been a superintendent; good references. B. B.,
1 1 d Care Clay-Worker.

WANTED — One 9-foot dry pan; in good order; write fully, stating condition and maker, with lowest cash price. Address
W. C. MORRIS,
1 1 d Laclede Building, St. Louis, Mo.

WANTED — Superintendent for fire brick works in central Indiana; only thoroughly first-class man need apply. Address
THE GARDEN CITY SAND CO.,
1 1 d 1203 Security Building, Chicago, Ill.

WANTED — Parties to make contract for making five million common brick on our land; wood and coal cheap and clay handy; correspondence solicited.
BUSHNELL & MARIETTA PRESS BRICK CO., Bushnell, Ill. 1 1 dm

WANTED — Assistant manager for fireproofing, hollow block tile, terra cotta, lumber and face brick works. Address, giving experience, reference and wages expected, HOLDEN CLAY WORKS,
1 1 d Mineral Point, O.

FOR SALE — First-class tile works, equipped for making drain tile, brick and flower pots; four acres of good clay and shale. Address
GOODING & STOOKEY,
1 3 c Belleville, Ill.

WANTED — Position as manager by practical experienced man in the manufacture of fire brick, tile slats, stone linings, common brick, sewer pipe, etc.; all kinds of kilns. Address R. W.,
1 1 c Care Clay-Worker.

FOR SALE CHEAP — One 4-mold Simpson dry press; used one year; cost $4,000; will sell for $1,100 f. o. b. cars Washington, D. C.; also two 100 H. P. Westinghouse engines $400 a piece. Inquire of
TOM COLLINS,
Phoenix Building, Washington, D. C.
1 3 d

FOR SALE — A large lot of good second-hand St. Louis fire brick and 12-inch floor fire brick, but little used and in first-class condition.
SIOUX PAVING BRICK CO.,
12 3 d Sioux City, Ia.

WANTED—Position as foreman of brickyard. Thirty years experience with soft machines. Have burned with wood, coal and natural gas, also coking table furnaces. Best of references.
1 1 p Address GOOD LUCK,
care Clay-Worker.

WANTED—A hustler to fill position of traveling salesman for Sewer Pipe Factory Must be a man of good habits and familiar with the business. Write, giving references, to
1 1-d RICH, care Clay-Worker.

FOR SALE—New Brick and Tile Works. Built by citizens because must have the brick and tile. Extra good location, junction railroad.
1 1-d J. P. FARMER,
Sioux Rapids, Iowa.

WANTED—We would like to lease for a number of years, a brick factory fitted up for Hollow Fire-proofing work. Clay must burn clean color, and not contain much lime. Address offers with price and exact location to
1 1d D. D. care Clay-Worker.

FOR SALE — CHEAP—One second-hand No. 1 Giant side-cut brick machine, built at Bucyrus, O.; in good order; used to make less than one kiln of brick. Address
CHAMBERS BROS. CO.,
Fifty-second and Media Sts., Philadelphia, Pa. 1 1 d

FOR SALE — A Ross-Keller triple pressure, six-mold, dry-press brick machine, capacity 35,000 brick per day; good as new; used only 90 days, and it is in first-class condition. GEO. MATHERS,
12 3 dm 960 Nassau St., Cincinnati, O.

WANTED — Situation as superintendent or foreman of brick and tile works; 17 years' experience; thoroughly familiar with every detail of the business; no bad habits, and can give the best of references as to ability, industry, etc. Address
I. G. ERVIN,
310 N. Delaware St., Indianapolis, Ind.
1 2 cm

WARNING — All parties using or contemplating building a furnace consisting of a center coking table will please take notice. I hold letters patent No. 501,380 on such construction, and will protect my rights thereunder.
I will pay a liberal reward for information leading to the discovery of parties unlawfully using the same.
F. E. SWIFT, Patentee,
1 tf d Washington, Ia.

WANTED — Situation as superintendent, by a man of years of experience; thorough clay man and burner of up or down-draft kilns; understands all kinds of machines; thoroughly understands all details of the maunfacture of fine front brick (dry press or stuff mud), fire brick, sewer pipe, fireproofing and common brick; a No. 1 handler of men and a hustler himself; A No. 1 references. Address
"MACHINE,"
1 1 d Care Clay-Worker.

WANTED—At once, two good brick setters and one good engineer. Address
1 1-d THOMAS, care Clay-Worker.

WANTED —Within 60 days—8,000 pine pallets, 32 long or more, 10 wide.
H. H. WRIGHT,
12 1 50p Maitland, Mo.

FOR SALE—40 sets of iron axle trucks, 31 inches wide, good as new, used only two months. Address CARD,
1 1 c care Clay-Worker.

FOR SALE — Having purchased a Martin Letter A machine, I offer my Letter B and pug mill, 30,000 capacity, at a bargain.
JAMES B. OBERLY,
1 1 d Wilmington, Del.

NOMINAL RENT — Small brick plant, center mining region northern New Jersey; near three competing railroads; unlimited sale. O. H. BABBITT,
1 3 cm Morristown, N. J.

ENAMELER of bricks and terra cotta will be open for an engagement on April 1; will give proof of ability to firms of undoubted standing; no others need apply.
ROCKAWAY,
1 2 c Care Clay-Worker.

WANTED — A situation as superintendent or foreman of fire brick plant; understands the work thoroughly, both making and burning fire brick; many years' experience in large plants; can give best of references. Address SAM,
1 1 d Care Clay-Worker.

FOR SALE — The site of the Salamander works at Woodbridge, N. J., formerly used for the manufacture of fire brick, sewer pipe, hollow brick, etc.; also clay bank; on easy terms. Address
C. POILLON,
1 1 dm 39 Cortland St., New York City.

FOR SALE, RENT OR EXCHANGE — A brick plant in Northern Pennsylvania, situation first-class, an established business with an unusually good opportunity for expansion; Clay of finest quality suitable for roofing tile, fireproofing, drain tile and all kinds of brick. Clay works nicely in any machine, and does not crack or get out of shape in drying and burning. Plant has patent dryer, stationary kilns and modern machinery. Will sell, rent or exchange for good real estate or hardwood timber land. Address
13-dm J. C. J. care Clay-Worker.

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

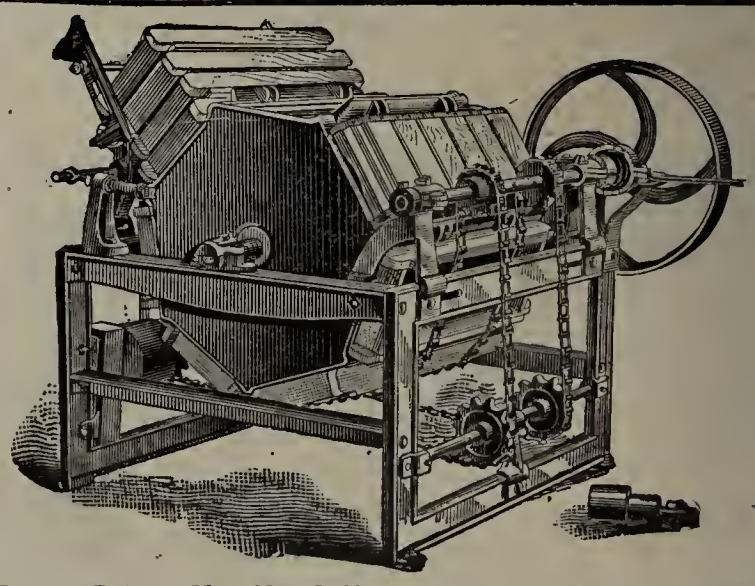
FOR SALE—A GOOD PROPERTY.

Brick and tileyards, consisting of 12 acres land, 7-room dwelling house, engine and machinery, with necessary sheds and buildings. Superior clay, easily worked, good territory, near large city, rapidly growing suburbs. Time allowed on part if wanted. Reasons for sale given. Correspondence solicited. Address, "E.,"
12 3 cm Care Clay-Worker.

CHAMPION Brick Mould
SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.



A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.

We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

The 14th Annual Convention

OF THE

National Brick M'f'rs Ass'n

AND

The American Ceramic Society,

WILL BE HELD AT

DETROIT, MICH., MONDAY TO FRIDAY, FEBRUARY 5th to 9th 1900.

The Session of the Ceramic Society will be held Monday and Tuesday.
The Sessions of the N. B. M. A. will be held Wednesday, Thursday and Friday.
Saturday will be given up to sight-seeing about Detroit.

FULL VERBATIM REPORT of the Convention, which bids fair to be the most successful in the history of the N. B. M. A., will be given in the February CLAY-WORKER, including all papers, discussions and portraits of prominent members. Next to attending the Convention, the best thing a brickmaker can do is to read the CLAY-WORKER'S report. It is so full and accurate that those who attend the Convention would not be without it, and those who don't go can't afford to miss it. The consensus of opinion among progressive brickmakers is that the Convention Number of the CLAY-WORKER is the most valuable publication of the year. If you are not already a regular subscriber don't neglect to send in your order in time to get the February or Convention Number.

1900 FEBRUARY 1900						
Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

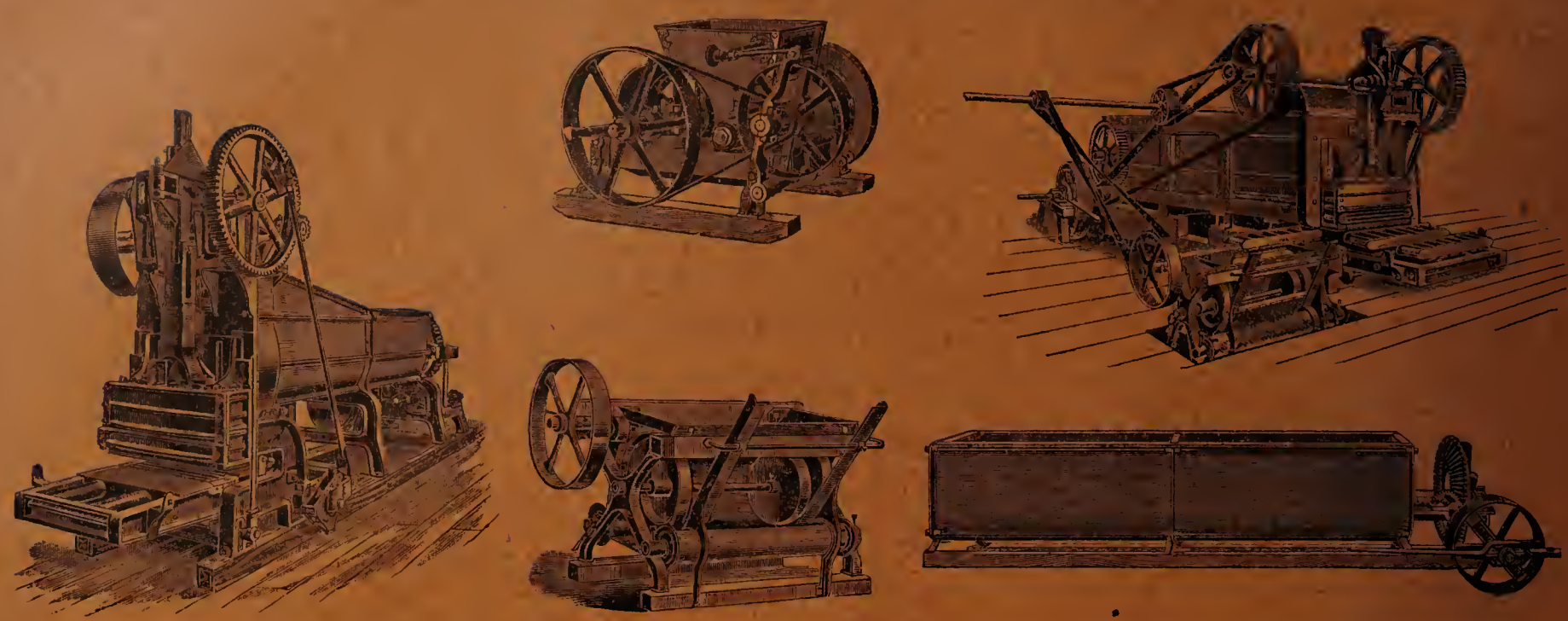
ADVERTISING MATTER TO INSURE INSERTION MUST BE RECEIVED BY THE FIRST OF THE MONTH.

The CLAY-WORKER is now in its **17th Year** and is recognized the world over as the best clayworkers' magazine published in the English language. It has more readers at home and abroad than all its followers combined. Take the CLAY-WORKER and you get the best value for your money. $2.00 a year. Every issue is worth that sum.

T. A. Randall & Co.,

PUBLISHERS.

INDIANAPOLIS, IND., U. S. A.



We Manufacture

THE Most Complete Line of Soft Clay Machinery in the United States. Horizontal Stock Brick Machines, Disintegrators, Mold Sanders, Pug Mills, Granulators, Cars, Winding Drums, Trucks, Barrows, Molds, Shafting, Pulleys, Hangers, Kiln Castings and all Brickyard supplies. We save you all commissions.

Write for prices and terms.

C. & A. POTTS & CO., 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**

(See Ads. on Pages 82 and 83.)

....WHAT THE CLAY WORKER NEEDS....

Is a belt that will accomplish the heavy work required of it,

holding the bucket firmly without slipping.--This the

Leviathan Belting

does better than any other, and, what is of more interest to Clay Workers, the LEVIATHAN will

WORK FOR YEARS IN A DUST CLOUD,

or exposed to weather conditions of any kind.

THESE ARE THE REASONS WHY LEVIATHAN BELTING IS IN SUCH GENERAL USE AMONG CLAY WORKERS.

MAIN BELTING COMPANY,

1221-41 Carpenter St., Philadelphia, Pa.

1221-41 Market St., CHICAGO. Send for Price List and Samples. 120 Pearl St., BOSTON.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS, Agent and Patentee, **161 Grand Street, Rahway, N. J.**

ELEVATORS and CONVEYORS,

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,

Detroit, Mich., U. S. A.

FOR SALE — One of the best paying brick and tile factories in Iowa.
12 tf d Lock Box 36, Lohrville, Ia.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — Brick and tile works, in good condition; large capacity; plenty of market; would consider other property for part pay; now in operation. Address
D. W. TOWNSEND,
9 6 d Cherokee, Ia.

FOR SALE — One automatic end cut brick machine, Penfield make; one pug mill, roller crushers and other equipments, with engine; capacity 20,000 per day. Address
S. W. BURNHAM,
11 2 d Lincoln, Neb.

FOR SALE — One four-mold Eureka dry pressed brick machine, but little used, at a great bargain; one No. 2 Worrell dryer; one 48-inch Ross disintegrator.
C. SIEDLER,
11 tf d 156 Fifth Ave., New York, N. Y.

WANTED — For a large clayworking establishment, located near New York city, an experienced superintendent or manager, who thoroughly understands the manufacture of fireproofing as well as common brick; applicants please state past experience, amount of salary expected, references, etc. Address
H. F. JAMES,
11 tf d 156 Fifth Ave, New York.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address
OLD BRICKMAKER,
1 tf d Care Clay-Worker.

FOR SALE CHEAP.

Complete brickyard, in the centennial city of Ohio, with 12 acres land; good clay bank, 9 and 12 feet deep. Complete outfit, consisting of 2 good brick machines, one Penfield and other a Monarch; 2 engines, 100-horse-power boiler; a dryer, with large Buffalo fan, the attachments for same. and all necessary equipments for a first-class brickyard. Paved street and 2 railroads to the yard. Price for brick, $6 to $7 per M. Reasons for selling, poor health. Address,
JOSEPH GATES,
12 3 cm Toledo, O.

FOR SALE.

One Martin horse-power brick machine. One Standard wood-frame horse-power brick machine. One Standard wood-frame steam-power brick machine. Two extra heavy Quaker machines. One Fletcher & Thomas pug mill. One Monarch brick machine. One Anderson brick machine, with 12-foot pug mill. Four Reliable hand brick machines. One Wellington mold sander. One Potts mold sander. One Freese No. 4 board delivery cutter. One Brewer cruhser. One new Brewer crusher. One Carnell repress. One Penfield pug mill. Two Penfield roll crushers. One Penfield No. 7 brick and tile machine.
HORTON MANUFACTURING CO.,
12 tf d Painesville, O.

FOR SALE.

No. 1 Michigan brick and tile machine, with upright pug mill.
Pulleys, tile dies 2½ to 12, hollow block dies, and side and end cut brick dies.
"Little Giant" re-press.
Kiln grates and bands.
30 h. p. tubular boiler with stack and grates.
One 35 h. p. boiler, locomotive type.
No. 2 "Adrian" brick and tile machine, with tables, tile dies 2½ to 8, and side and end cut brick dies.
No. 2 crusher and elevator.
Canton Duplex boiler feed pump.
Watchman's time recorder.
1 tf d J. F. CLARK, Morenci, Mich.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of

WESTBROOK & WELLS, Ogdensburg, N. Y.

VanDuzen's STEAM JET Pumps.

Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** etc., for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } **Chenoa, Ill.**

IF YOU NEED ..

Wooden Pallets

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

W. B. MERSHON & CO.,

Saginaw. East Side Mich.

FOR SALE CHEAP.

Two 4-Mold Simpson Dry Presses, Cost $3,500 each. Only used three months. Plant having been changed to Paving Brick. Just as good as new. Will sell for $1,500 each F. O. B. cars, Cleveand, Ohio. Inquire of

FRANK B. MANY,
809 Cuyahoga Bldg. Cleveland, Ohio.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

Phillips and McLaren,

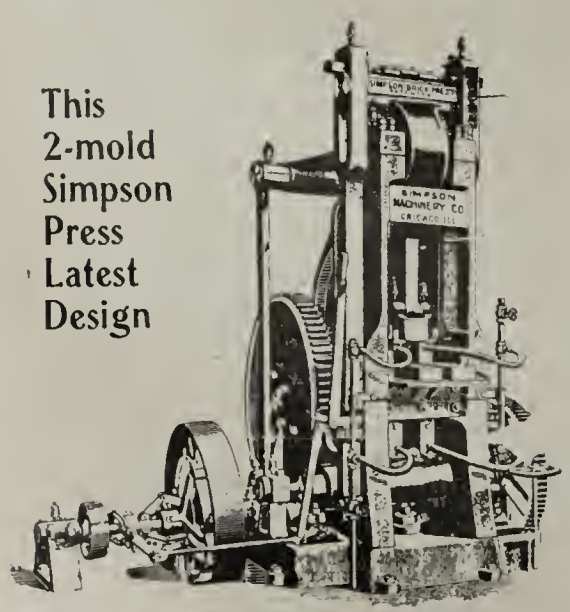
Proprietors,

Fisher Engine, Foundry and Machine Works,

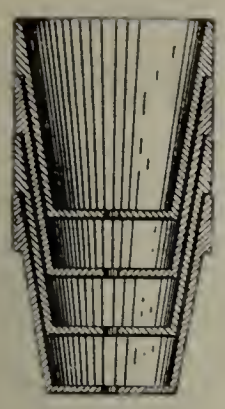
24th and Smallman Sts.,
PITTSBURG, PA.

For Sale at a Bargain

This 2-mold Simpson Press Latest Design



WESTERN MACHINERY & SUPPLY CO.
163 La Salle Street, Chicago.



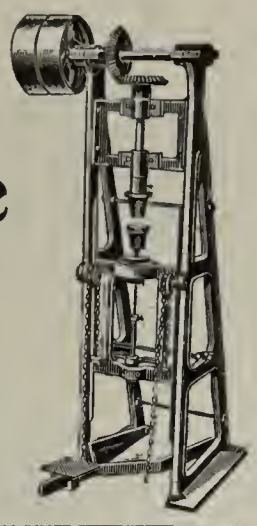
Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.



The Rockwood Mfg. Co.,

78 South Pennsylvania St., INDIANAPOLIS, IND.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR,

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels. Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., Western Ave, 17th-18th St. CHICAGO, ILL.

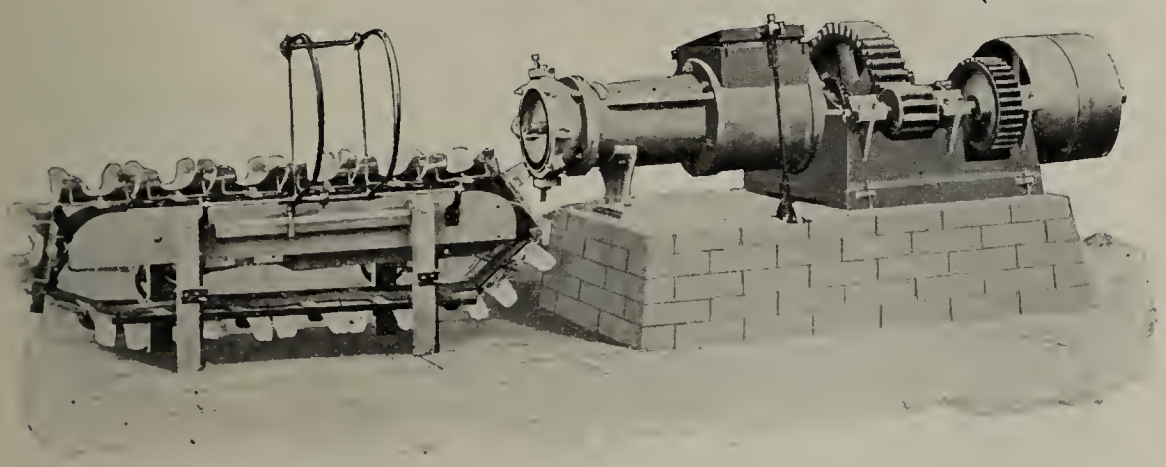
Our new Catalogue No. 25 (380 pages), will be sent upon application.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Davis's Brick, Tiles and Terra Cotta. Third Edition. Revised, Improved and Enlarged.

A Practical Treatise on the Manufacture of

Brick, Tiles and Terra-Cotta:

Including Stiff Clay, Dry Clay, Hand-made, Pressed or Front, and Roadway Paving Brick, Enameled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra Cotta, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics, and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace With a Detailed Description of the different clays employed, the most Modern Machinery, Tools and Kilns used, and the processes for Handling, Disintegrating, Tempering and Molding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition: Revised and in great part rewritten. Illustrated by 261 engravings. 662 pages, 8vo. Price, **$5.00**

This volume will be sent by mail to any address in the world, or delivered by express C. O. D., freight paid, to any address in the United States for **$5.00**

A circular of eight pages with specimens of the illustrations, showing the full Table of Contents, will be sent free to any one furnishing his address.

Our New and Revised Catalogue of Practical and Scientific Books, 92 pages, 8vo, a New Catalogue of Books on Steam, the Steam Engine, etc., and our other Catalogues and Circulars, the whole covering every branch of Science applied to the Arts, sent free and free of postage to any one in any part of the world who will furnish us with his address.

HENRY CAREY BAIRD & CO.,
Industrial Publishers, Booksellers and Importers,
810 Walnut St. PHILADELPHIA, PA., U. S. A.

ANGLO-AMERICAN POTTERY,

Old English China with American Views.

A Manual for Collectors, by

Dr. Edwin AtLee Barber, A. M., Ph. D.

Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

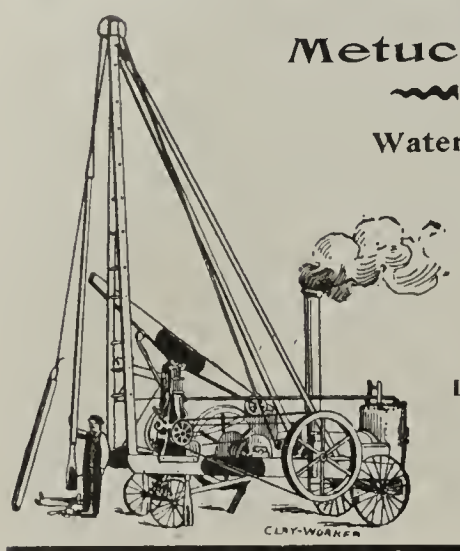
The price is $1 60 per copy, postage prepaid.

T. A. Randall & Co.,
The Clay-Worker,
INDIANAPOLIS, IND.

W. R. Osborne,

Metuchen, N. J.

Water Wells, Tanks, Pumps, Etc.



LOW PRICES

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.

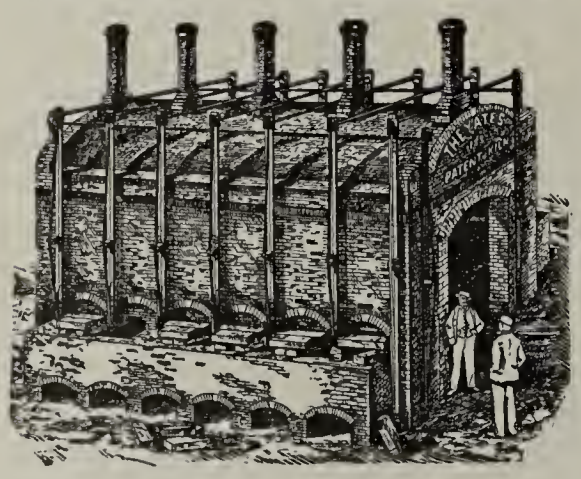
NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. Carbonate of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

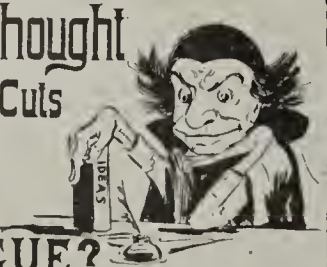


For Economy of Fuel and Percentage of Hard Burned Brick,

This kiln has no equal. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.
Hot air dryer. Continuous and Muffle Kiln.

ALFRED YATES,
JOHNSONBURG, PENN

Have you thought About your Cuts for your NEXT CATALOGUE?



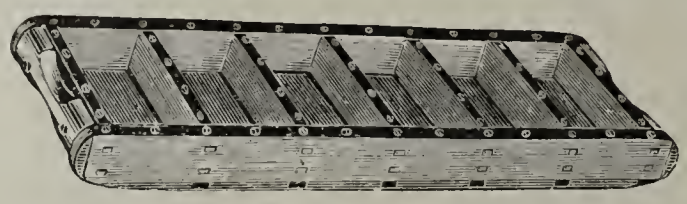
We Make 'em Right

INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.
INDIANAPOLIS, IND.

HARDIN & GRAY.

MANUFACTURERS OF

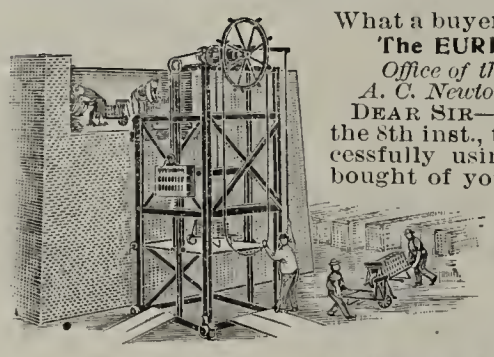
BRICK MOULDS



Of every kind and description. We make a specialty of Brick Moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.

Don't fail to get our prices. (Telephone 1084.) 1510 W. Washington St., Indianapolis.



What a buyer in 1890 says to-day of
The EUREKA BRICK ELEVATOR

Office of the Buffalo Brick Association,
A. C. Newton, Patentee, Cresent, N. Y.

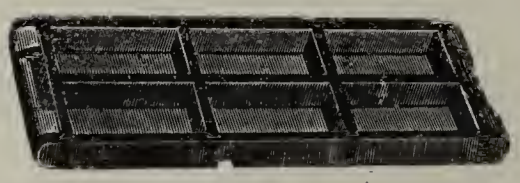
DEAR SIR—Replying to your inquiry of the 8th inst., this Association is still successfully using the two brick elevators bought of you in 1890. They are useful and practical machines, and the long and hard use of them by us shows that they are constructed in a very serviceable manner.

Very truly yours,
The Buffalo Brick Asso.
O. W. WAGER, Mgr.

Write for particulars.

1899--BRICKYARD SUPPLIES--1899

6 Brick Machine Mold.



6 Brick Hand Mold

3 Brick Hand Mold.

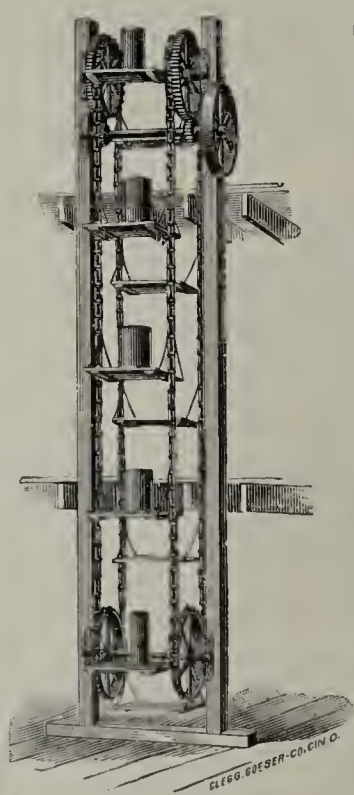
NOW Is a good time to look over your stock and see what you will need for the coming season.

Send your orders to "Arnold's" for what you need. You can send the order now and we will have them ready to ship at the time you want them.

You will be sure to get the best there is made and if you want anything special in the line of Moulds, Trucks or Barrows of different designs you can get it made to order here at reasonable prices.

Moulds, Trucks and Barrows a Specialty.

D. J. C. ARNOLD, New London, Ohio.



TILE ELEVATOR.

The Jeffrey Manufacturing Co.,

Columbus, Ohio, U. S. A.

ELEVATING--CONVEYING MACHINERY.

CONVEYORS FOR HANDLING
Green Tile,
Brick,
Sewer Pipe,
And Packages of all Description.

Chains, Standard and Special,
Sprocket Wheels,
Elevator Buckets. Elevator Boots,
Shafting, Cable Conveyors,
Hangers, Apron Conveyors,
Pulleys, Spiral Conveyors.

We make Elevators, Conveyors, Carriers, Power Transmission Machinery and all sorts of Labor Saving, Profit-producing appliances for use in and around Tile Mills, Brickyards, etc., etc.

We also submit designs and build machinery to meet special requirements in the lines named above.

Write to us for estimates, before placing your order. We can probably save you some money.

SEND FOR CATALOGUE.

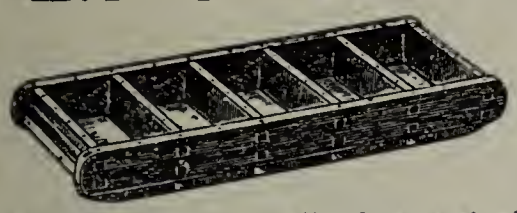
NEW YORK OFFICE, 41 Dey Street.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

G. COLDEWE & CO.



MANUFACTURERS OF ALL KINDS AND SHAPES OF

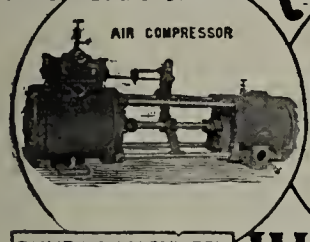
HAND and.... MACHINE **MOULDS**

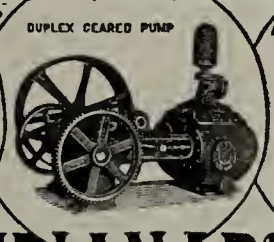
We manufacture the the most substantial Moulds known and guarantee every Mould to be first-class in material and workmanship.

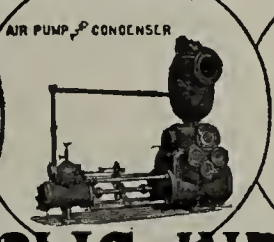
A Special Discount on all orders received on or before March 1st.

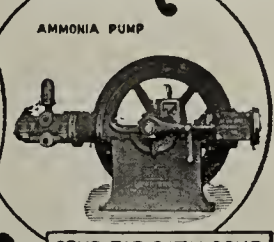
No. 829 Sixth St., Milwaukee, Wis

DEAN BROS' STEAM PUMP WORKS.









PUMPING MACHINERY FOR ALL PURPOSES

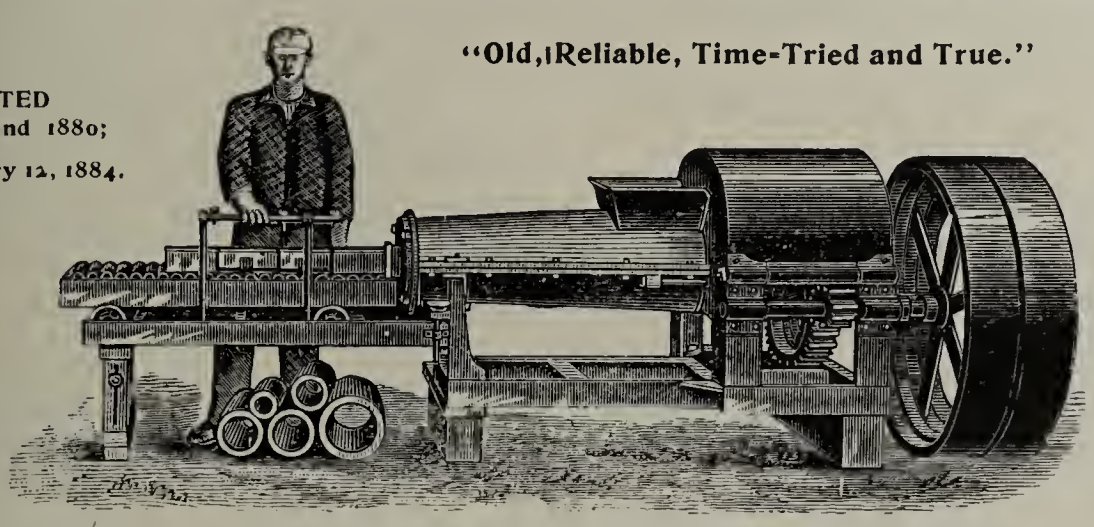
INDIANAPOLIS, IND.

SEND FOR CATALOGUE AND PRICES

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY,
Industrial Agt., St. Louis, Mo.

or

E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western RAILWAY.

Short line between **INDIANAPOLIS** and **KANSAS CITY.** The **only line** running **Reclining Chair and Sleeping Cars** between **CINCINNATI, INDIANAPOLIS, DECATUR** and **SPRINGFIELD, ILL.**

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	3.35 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

Solid Train Between

Sandusky and Peoria

—AND—

INDIANAPOLIS and MICHIGAN CITY,

FT. WAYNE and CONNERSVILLE.

—o—

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger	7:00 a. m.
*No. 22 Passenger	1:20 p. m.
No. 24 Passenger	7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger	10:20 a. m.
No. 23 Passenger	2:50 p. m.
No. 25 Passenger	6:20 p. m.

*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on

A. H. SELLARS, Agent,
Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent. CINCINNATI, OHIO

H. W. FULLER, Gen'l Pass. Agent, WASHINGTON, D. C.

COLORADO TOURISTS

The only Direct Line to Manitou and Colorado Springs.

Great Rock Island Route

ALSO BEST LINE TO DENVER.

Acknowledged by all to have the Best Dining Car Service.

Buffet Library Smoking Cars.

If you want a delightful trip on a strictly "Up-to-date" train travel by the GREAT ROCK ISLAND ROUTE.

For handsome book, "MANITOU AND THE MOUNTAINS," address JOHN SEBASTIAN, G. P. A., Chicago, Ill.

The Philadelphia Commercial Museum,

DR. WILLIAM P. WILSON, DIRECTOR,

Supplies DETAILED, SPECIFIC INFORMATION concerning the TRADE CONDITIONS of the WORLD'S MARKETS.

It tells WHERE THE MARKETS ARE and by whom supplied.

Who the RESPONSIBLE BUYERS ARE, and HOW TO REACH THEM.

It can ascertain FOR YOU the particular REQUIREMENTS of any or all markets in THE LINE OF GOODS YOU MAKE.

It has inaugurated a most valuable method of REGISTERING AMERICAN MANUFACTURERS in Foreign Countries by means of

Card Index Files

Placed in the CHAMBERS OF COMMERCE in FORTY-FIVE of the PRINCIPAL COMMERCIAL CENTERS OF THE WORLD.

This is a movement in the Interest of American Commerce with which YOU SHOULD BE IDENTIFIED.

Write for particulars to

The Philadelphia Commercial Museum,

233 South Fourth Street, Philadelphia, Pa.

FIRE BRICK

Dover Fire Brick Co., INCORPORATED 1870. MANUFACTURERS OF Dover and Buckeye Fire Brick, *Unexcelled for Kiln Purposes.* 44 Mercantile Bank Bldg., Cleveland, Ohio.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.

Increases grinding capacity.

Gives a finer grade of clay

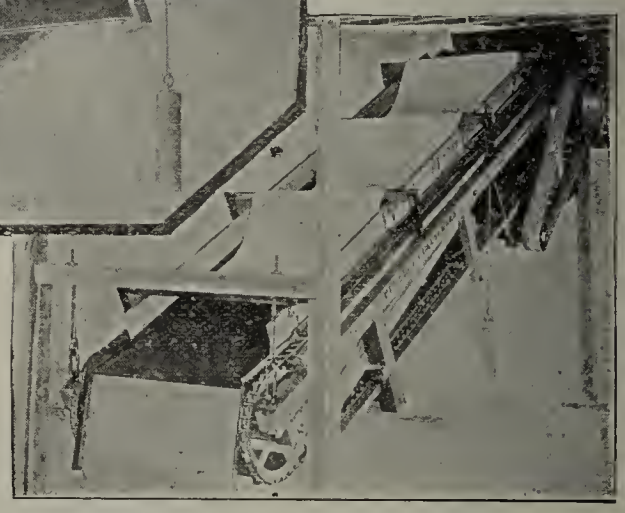
Does the work as well in cold weather as in warm.

Screens cold moist clay as well as dry.

It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush

HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,

Bloomington, Ill.

The Peerless System Up-Draft, Down-Draft and Continuous Kilns

Is the Acme of Perfection in Brick Burning.

READ WHAT THEY SAY ABOUT IT:

LaPrairie Pressed Brick and Terra Cotta Co., Qu bec:

"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, demonstrates our Entire Satisfaction with your PEERLESS SYSTEM.

Elmsdale Brick Co., N. S.:

"Never saw a Kiln work so even and free both in watersmoking and burning in all my life. The arches were as good as any other part of the Kiln."

John Cubbins Sons, Memphis, Tenn.:

"After burning the first kiln that was changed, the second time, we found the improvement so great and so much Superior to the old up-draft kilns, that we are now changing our entire system to your PEERLESS PATENT."

Jacob Kline, Baltimore, Md.:

"Your system of burning good hard brick is without doubt the best I have ever seen."

And there are Others.

No matter what you manufacture, or the capacity of your plant, if your make is of clay and you want it burned, write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. Montezuma, Ind.

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.

For **uniformity** in **burning, hardness** of **ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump**, and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

WEST and SOUTH

run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

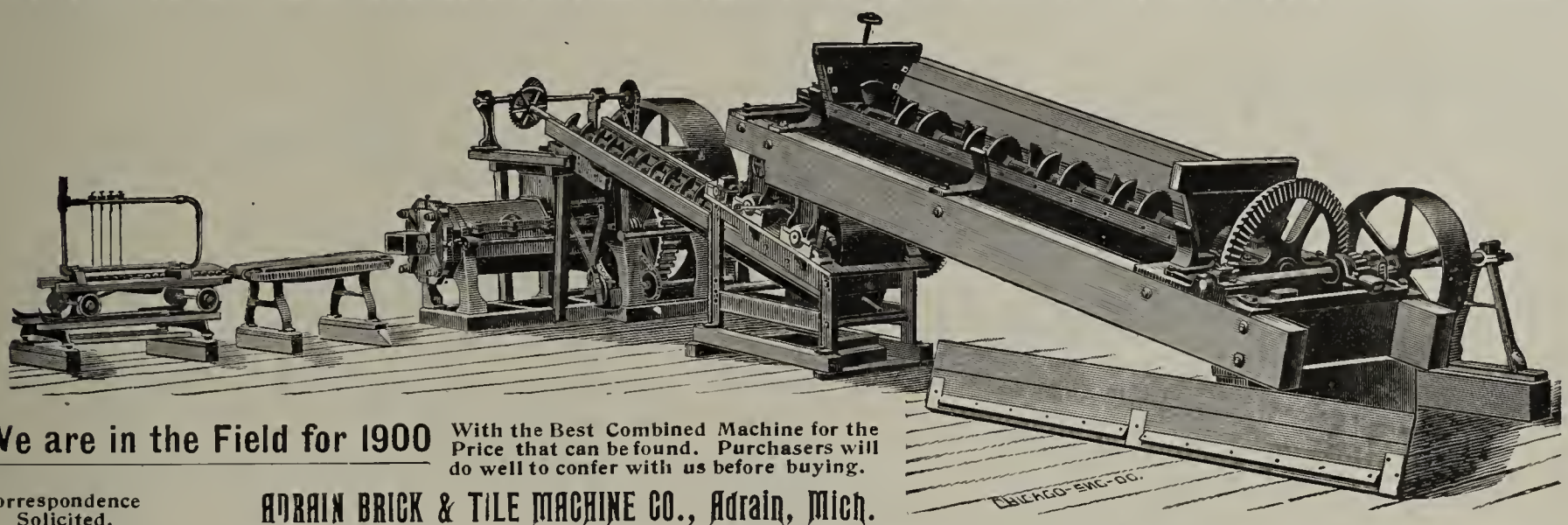
South Dakota	Kentucky
Minnesota	Tennessee
Iowa	Arkansas
Wisconsin	Mississippi

Illinois, Indiana, Louisiana,

Presenting an unequaled territory for diversified industries, and possessing

Fine Sites for New Mills, Best of Freight Facilities--Coal Fields--Close Proximity to Distributing Centers. Intelligent Help of all Kinds. Many Kinds of Raw Material.

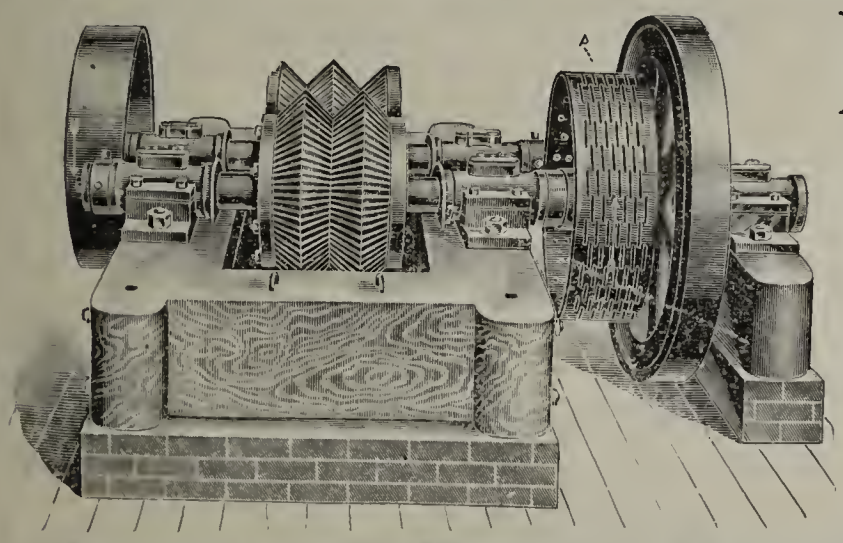
To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered Textile Industries in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.



We are in the Field for 1900 With the Best Combined Machine for the Price that can be found. Purchasers will do well to confer with us before buying.

Correspondence Solicited.

ADRAIN BRICK & TILE MACHINE CO., Adrain, Mich.



NEWELL CRUSHER.

Successfully crushes any and all kinds of Clays, preparing same for Brick, Tile or Terra Cotta. Fully guaranteed. Fast shaft fitted with Para Pneumatic Pulleys, increasing power of the belt, and efficiency of the crusher.

Also we equip these machines with Improved Elastic Roller Bearings when when desired. These bearings greatly reduce friction thereby saving power in operating, and insuring an always cool journal.

Our Crushers will do the work where others fail. Prices reduced Quality maintained.

Extract from a recent letter from the Frontier Brick Works, Niagara Falls, N. Y., "THE CRUSHER RUNS FINELY, AND IS ENTIRELY SATISFACTORY."

Write us for price and particulars, stating capacity wanted.

DUPLEX HEATING & MACHINE CO. L'td. Successsors to Newell Universal Mill Co. 534 West 22d. St., NEW YORK.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

Present capacity ten million. We are now prepared to furnish fine vitrified paving and extra hard foundation brick in any quantity. Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING.

SYRACUSE, N. Y.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO.,
Publishers,
INDIANAPOLIS, IND., U. S. A.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
TELEGRAPH OFFICE,
WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

J. L. HIGLEY & CO.,

CANTON, OHIO.

Four of the largest and best paving brick plants in the world.

Canton Paving Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.
Write for prices.

T. B. McAVOY, PRESIDENT.
FRANK B. McAVOY, SEC. AND TREAS.

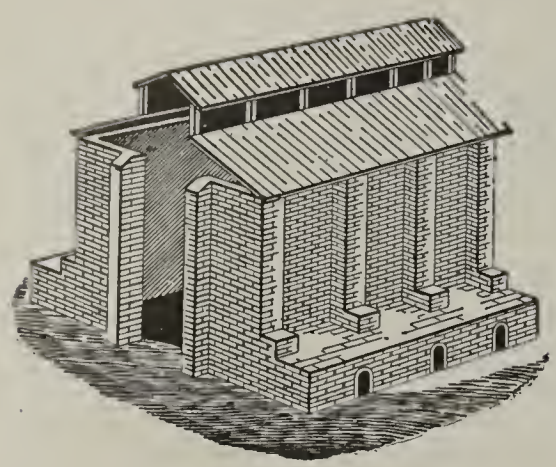
McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.

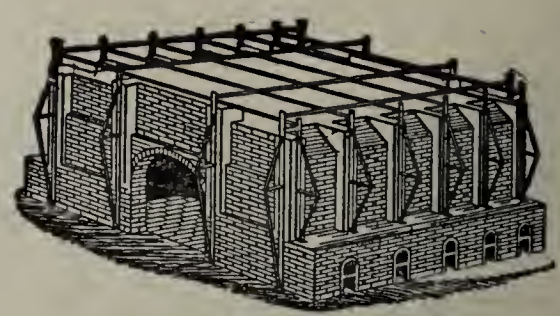


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, 2,422 Chestnut St., *Kansas City, Mo.*

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335. *ROME, GA., U. S. A.*

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

Have You Ever Considered This?

That a Very Small Quantity of

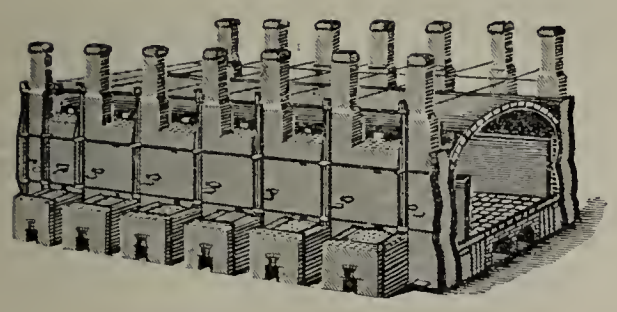
Dixon's Ticonderoga FLAKE GRAPHITE.

Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

The BUSHONG Down Draft Kiln



PATENTED JUNE 1896.

Phfladelphia, December 17, 1899.

M. M. BUSHONG, Esq.:

Dear Sir—Yours of 14th at hand. In reply to questions contained in same will say that we have used two of your Kilns for two years and find them a great improvement.

The arrangement of the Draft is excellent, giving us absolute control of same at all times.

We gain time, save fuel, and get better results. You can refer to us at any time.

Respectfully yours,
McAVOY VITRIFIED BRICK CO.,
FRANK B., Treas.

Is so constructed that the **heat** is **equally distributed** to **all parts** of the **Kiln.** For **uniform** and **all hard burning** this kiln leads them all. Built any size desired. This kiln is now being used by some of the largest brick plants in the country. For further particulars, address

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.

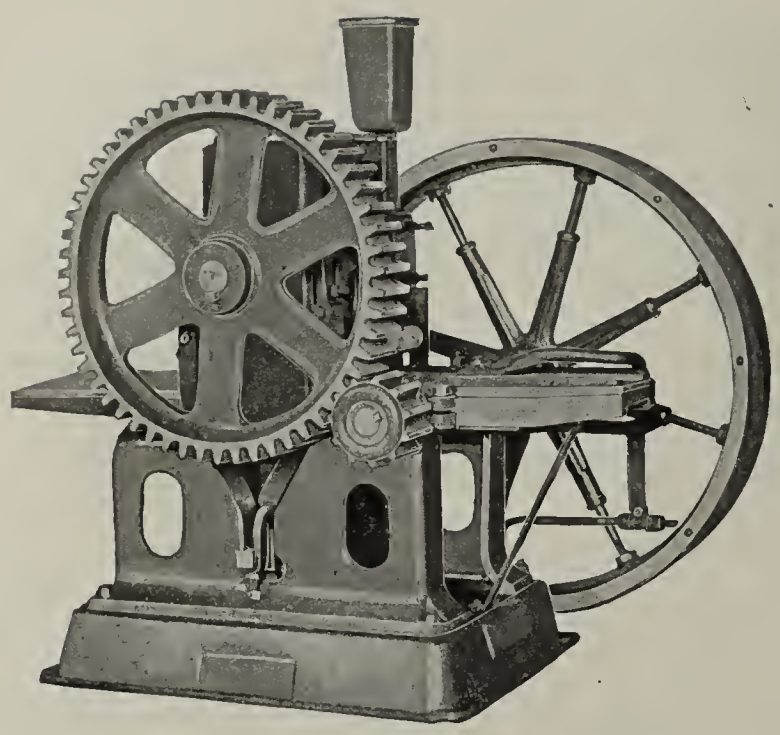
These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



The Steele Repress,

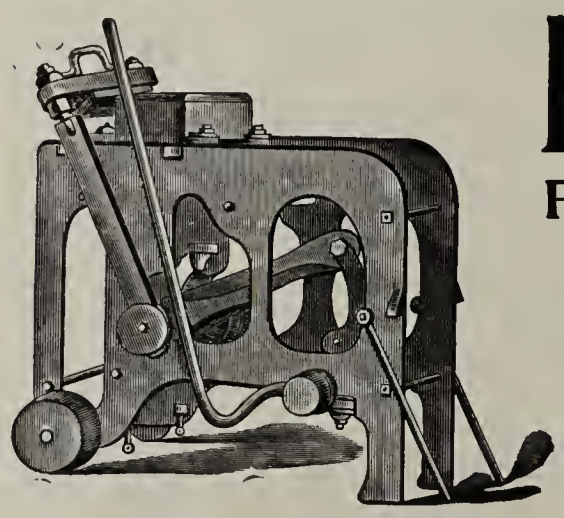
Price $185.00.

This is a very compact, strong and easily operated Press designed for the large number of yards which have more or less local demand for repressed brick which they are now filling with Hand Presses.

The compactness of this machine makes it almost impossible to break it, at the same time reducing the cost to very little more than hand press. A number of them have been in operation the past season giving perfect satisfaction.

> Fletchers, N. C., Oct. 27, 1899.
> Messrs. J. C. STEELE & SONS, Statesville, N. C.
> Relative to the Repress we are making 12 M brick per day and it works first rate with a standard paving die.
> Yours truly,
> ASHEVILLE BRICK & TILE CO.

J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**



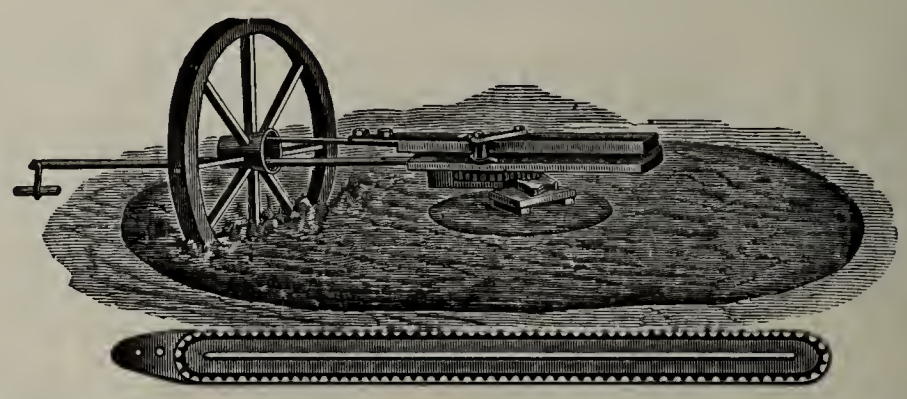
RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

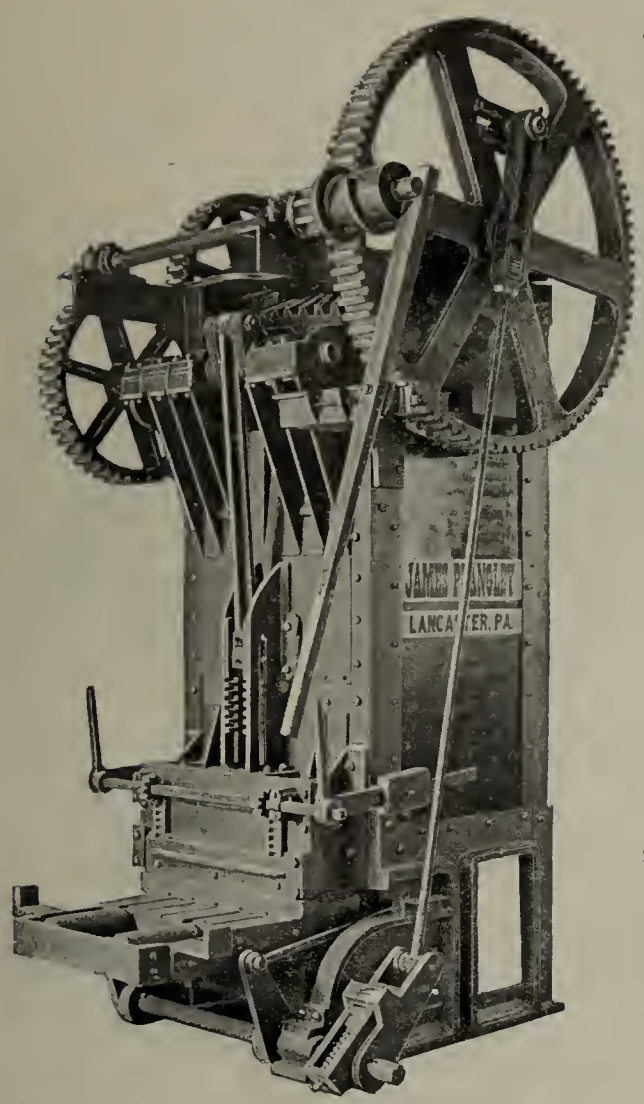
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



The Prangley Brick Machine.

BUILT TO LAST A LIFE TIME.

Large Capacity. Molds Brick Very Stiff. Pug-Mill Not a Necessity, Will Work Clay Direct From Bank.

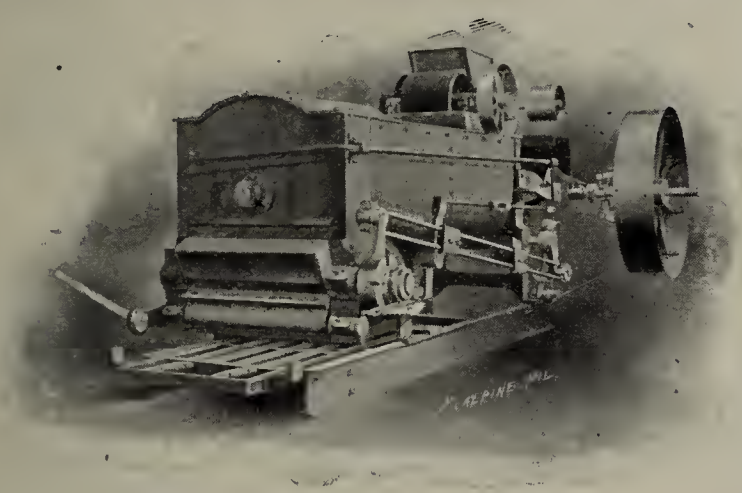
This Machine is constructed on practical lines by Mr. James Prangley, a successful brickmaker of thirty years experience. The tempering knives are of solid steel, and the press box is lined with steel, making it the most durable machine on the market. Brickmakers who buy the Prangley Machine will get their money's worth. Manufactured by

JAMES PRANGLEY,

Office 666 West Chestnut St.,

LANCASTER, PA.

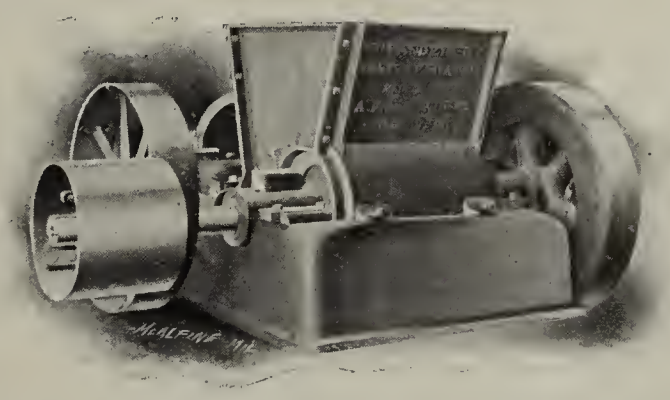
Write for Prices, etc., to
EDWARD C. HUHN,
Sole Selling Agent, 1215 Filbert St., Philadelphia.



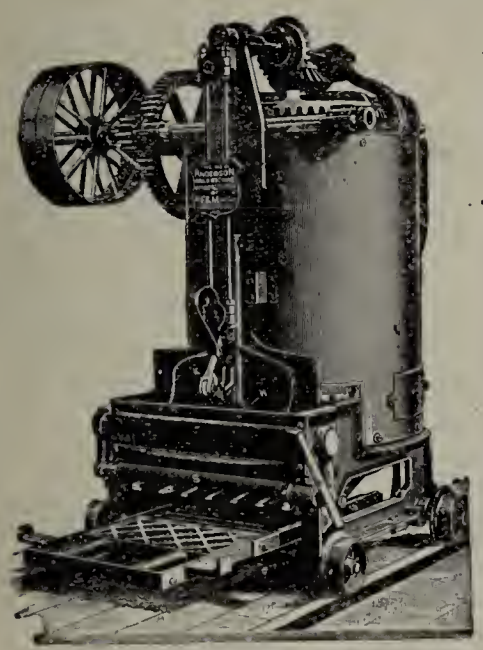
Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



Best Disintegrator on the Market.



Steel and Iron Upright Stock Brick Machine.

MANUFACTURERS OF . . . .

New Departure Tile Machine,

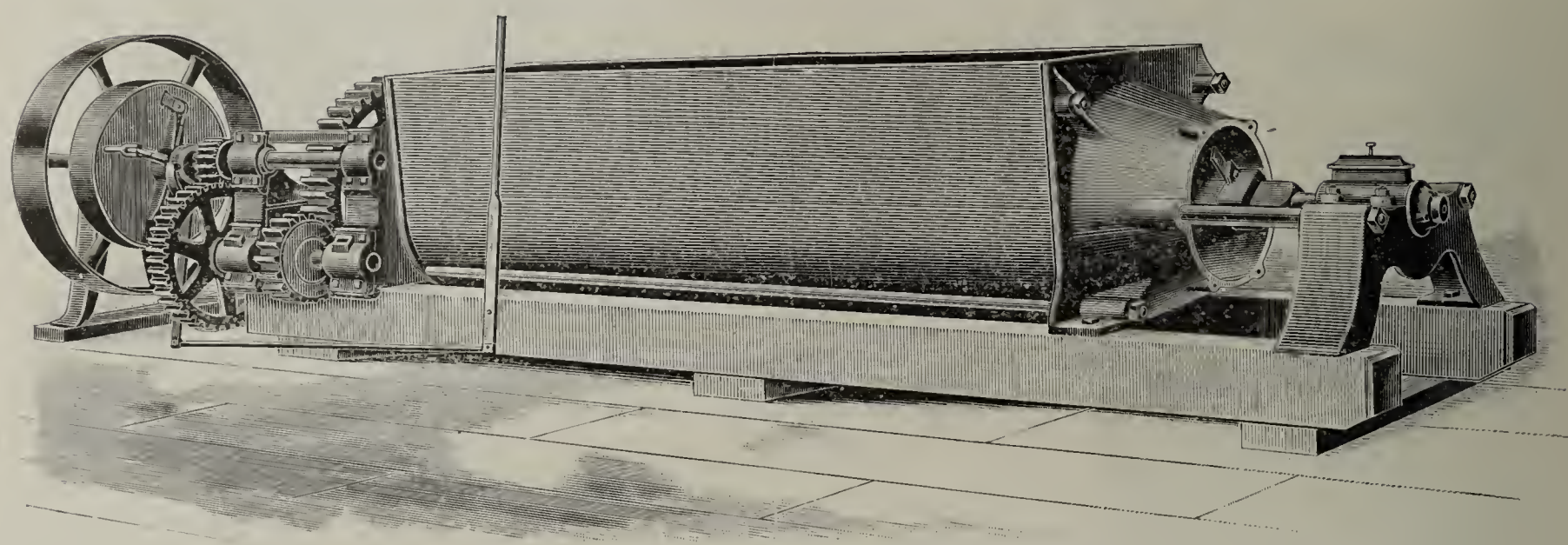
The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.

1899 Horse Power Machine.

The Anderson Foundry and Machine Works,
Anderson, Ind.

A GOOD THING.



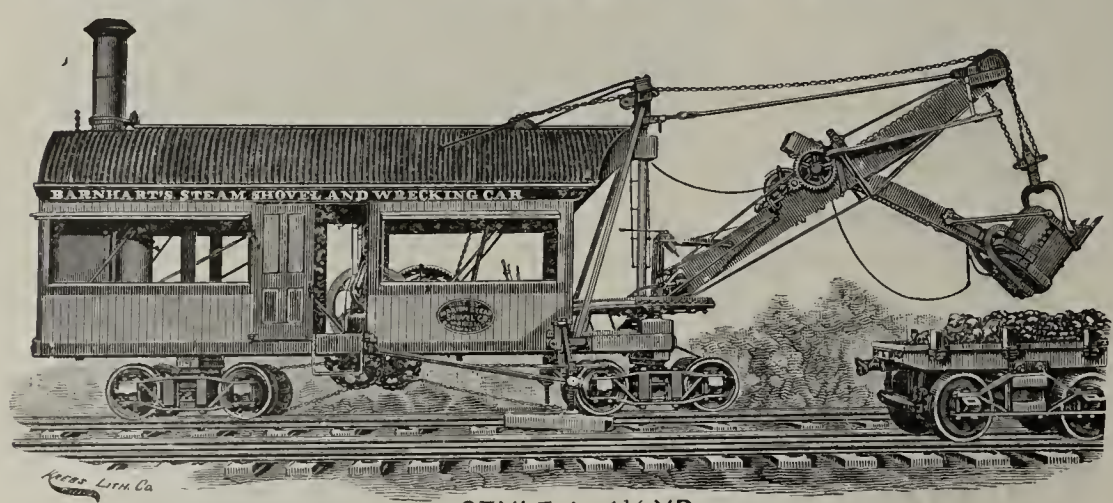
Leader Pug Mill, Size No. 9.

Send for circulars of our **Leader Machinery.**

Brick Machines, Pug Mills, Crushers, Disintegrators, Automatic Cutters, Etc., Etc.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

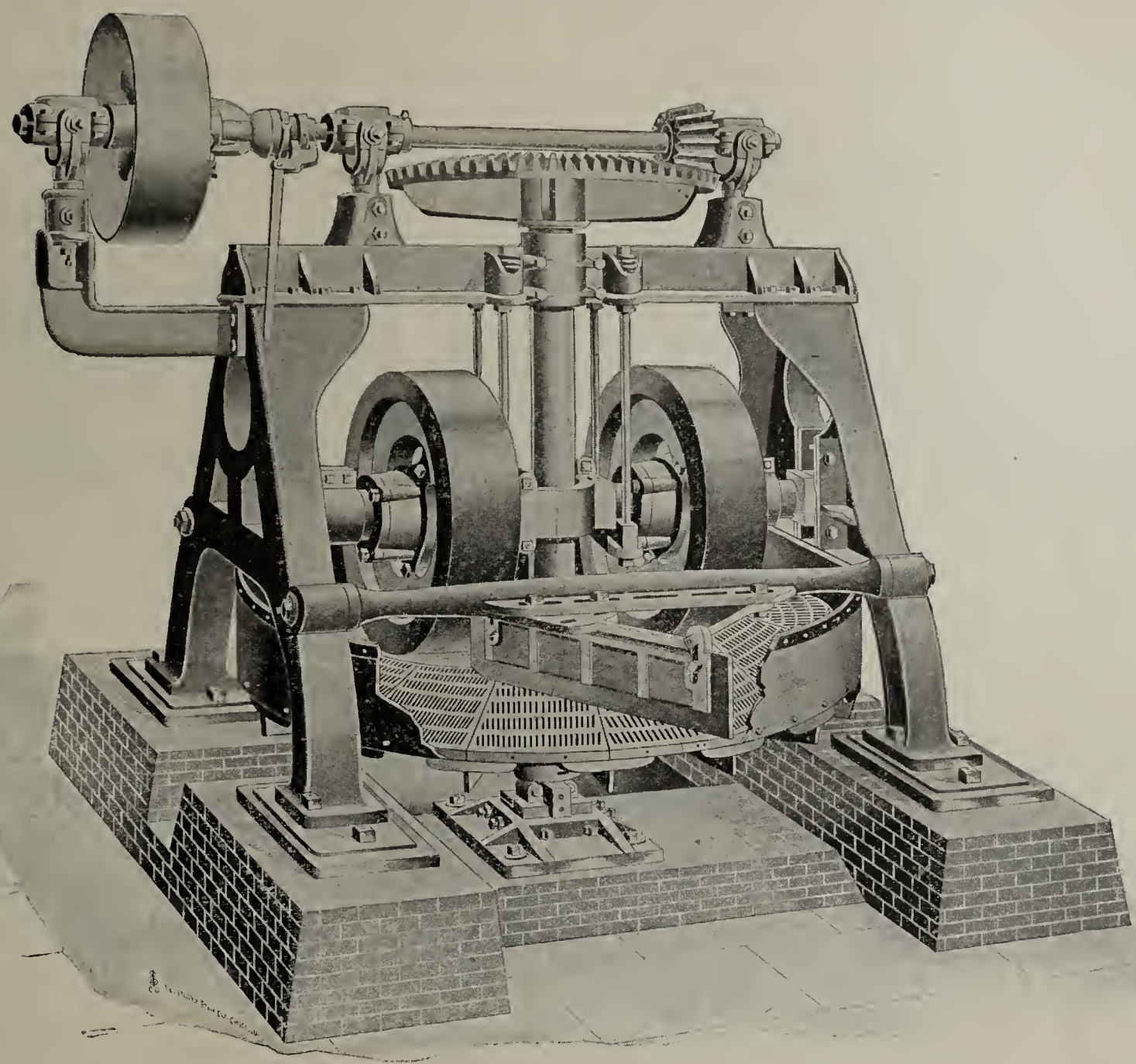
We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

STYLE C—¾ YD.

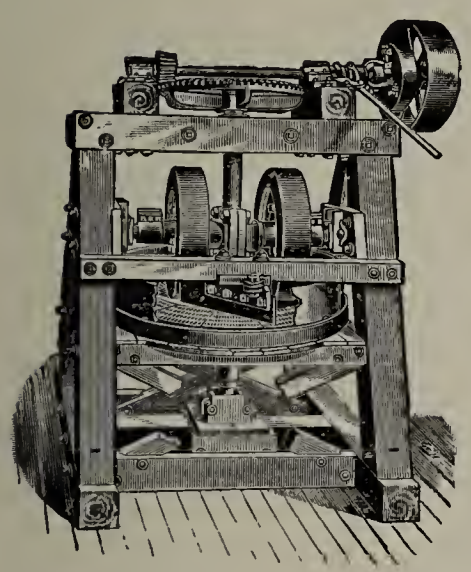
Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**

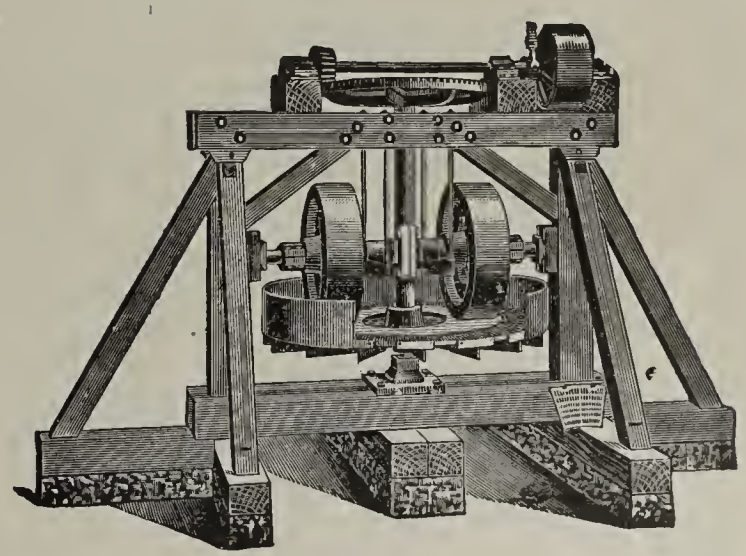


OUR SPECIALTY IS **DRY PANS.**



IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.

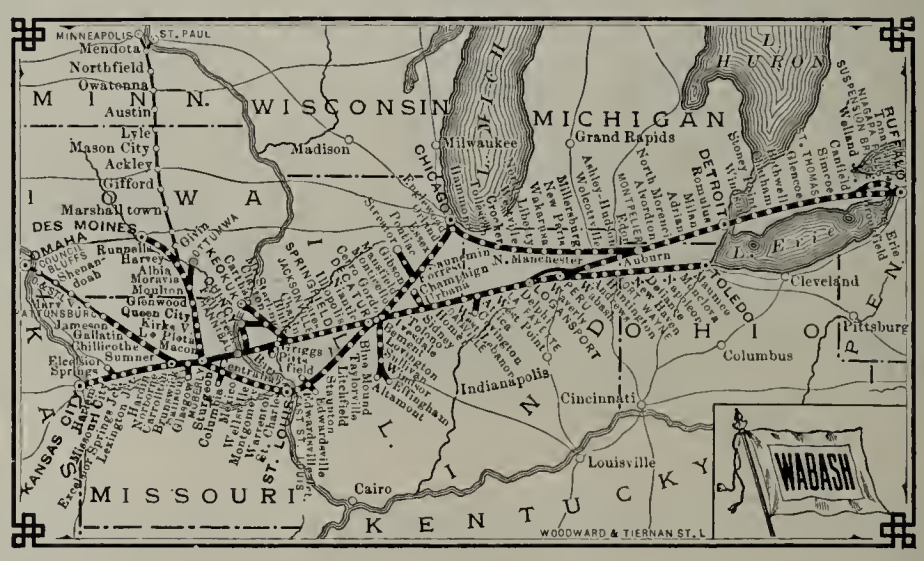


.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill., U. S. A.

The...

Is the Official Route to the N. B. M. A. meeting at Detroit in February 1900.



A glance at the Map will show that the **WABASH** is the direct route to Detroit from Kansas City, St. Louis, Chicago, New York, Boston and Buffalo. Fast Schedules and Elegant Through Service. The high Standard of both Cuisine and Service maintained on the **WABASH** Dining Cars is well known and Acknowledged.

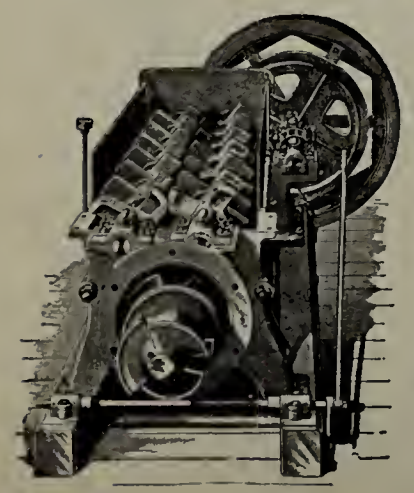
J. RAMSEY, Jr., V. P. and Gen'l Manager.

H. V. P. TAYLOR, Asst. Gen. Pass. and Ticket Agent.

C. S. CRANE, Gen. Pass. and Ticket Agent.

ST. LOUIS, MO.

INTERIOR VIEW OF ABOVE MACHINE.



Ready for the Battle! Prepared for the Conflict! Eager for the Fray!

Strong, Steady, Hardy, Well Equipped. Disciplined to Perfect Behavior. Fearless. That's our **PREMIER.** Note the Interior arrangement. Pugging more than doubled. Capacity 75,000 brick per ten hours. Write to us for more points.

J. D. FATE & CO.,

PLYMOUTH, OHIO,

Richland Co. U. S. A.

Manufacturers of

"PLYMOUTH" BRICK and TILE MACHINES

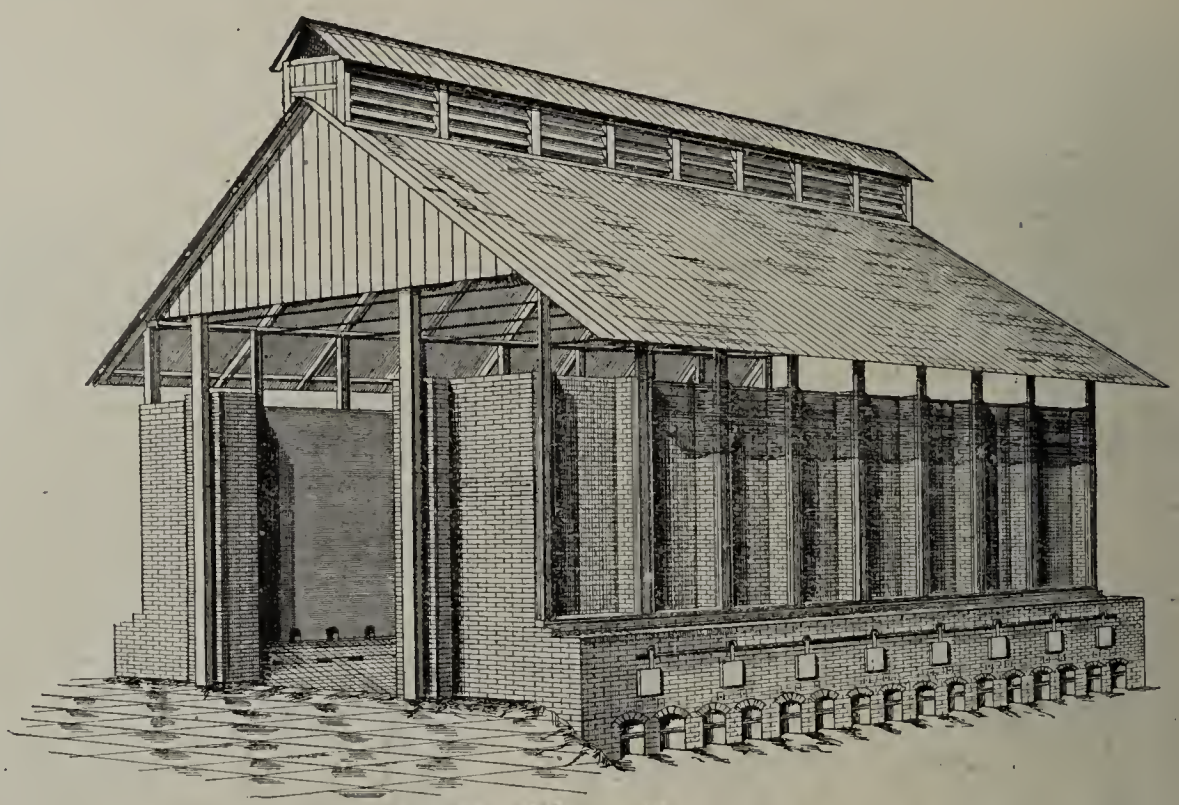
BENSING'S AUTOMATIC TABLES and other Yard Supplies and Equipments.

Western Representative, B. E. LaDOW, 405 Chamber of Commerce, Chicago, Ill.

The GRATH

IMPROVED...

Up and Down Draft Kilns

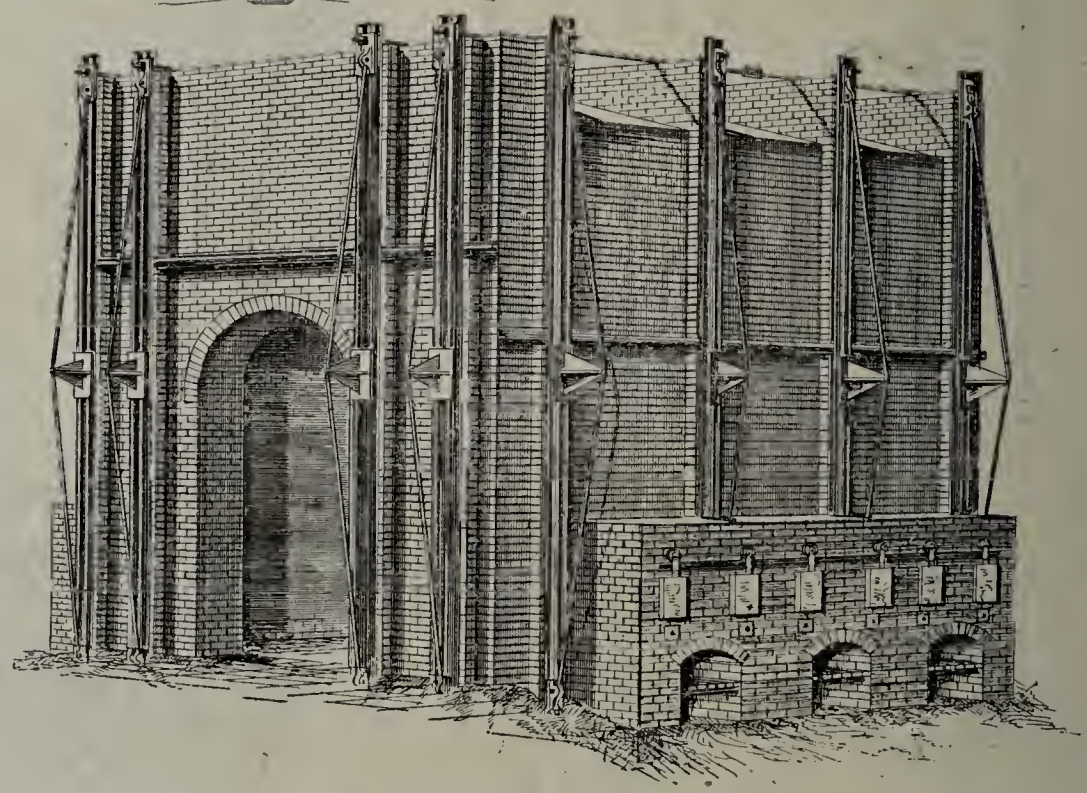


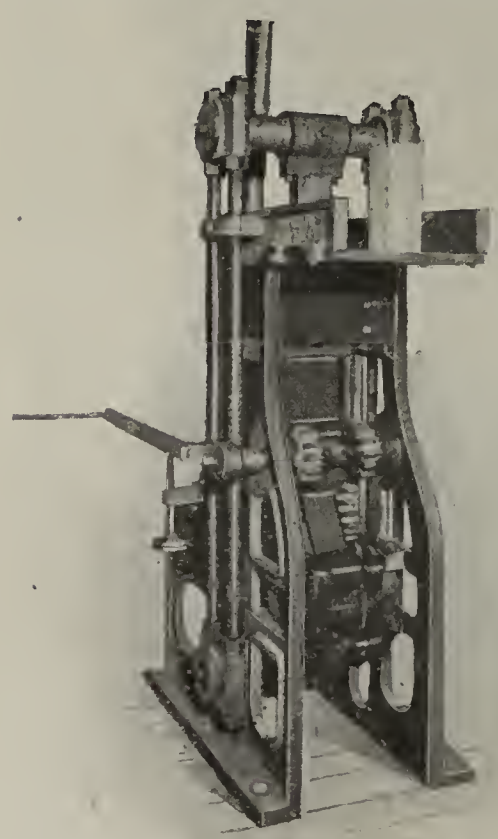
With Gas and Coking Furnaces Attached, for burning all kinds of Brick, Tile, Sewer Pipe, etc., using nothing but **Cheapest Slack Coal.**

The Grath Slack Coal Gas and Coking Furnaces

Can be attached to **any** style kiln and is the **only** Coking Furnace which **cokes all** the slack, produces more **heat** and less smoke than any other Coking Furnaces and uses less fuel.

We GUARANTEE PROTECTION to all using our Furnaces, and will prosecute all infringements upon our Patents.
Patents Nos. 636037, October 31, 1899.
Patents Nos. 640144, December 26, 1899.





The Grath Dry or Semi-Dry Clay Hand-Power Press

For plain or ornamental press brick, The only successful press of its kind in the market. Simple, durable and powerful. No brickyard complete without this press.

The Grath Brick Grinding Machine

For grinding Arch and Radius Brick of any hardness, even to a Vitrified brick. Simplest and Best in the market. No sand, no discoloration, which means satisfaction.

The Cheapest Grinding machine in the market

In use by American Hydraulic Press Brick Co., Collinsville, Ill.

FOR FURTHER INFORMATION ON ABOVE, ADDRESS

Mention the CLAY-WORKER.

The Illinois Supply & Construction Co., St. Louis, Mo.

THE "MOCK"

Force Feed, Double Press

BRICK MACHINE

Question

"When our clay is running stiff we have to double-press, causing much loss of time—

Does your machine overcome this defect?"

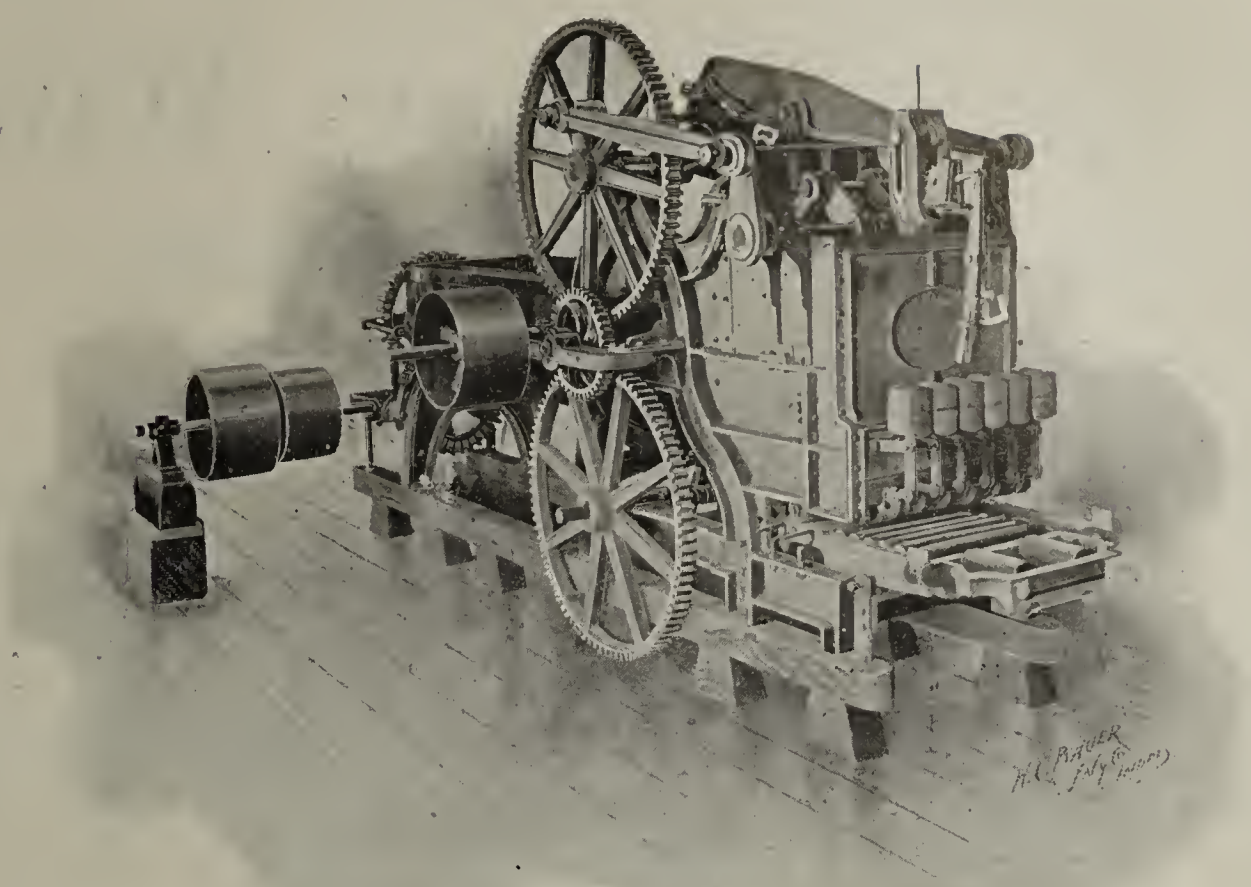
Answer

"We guarantee our Force-Feed appliance to give better results on stiff clay at one pressing than it is otherwise possible to get by double or even triple pressing."

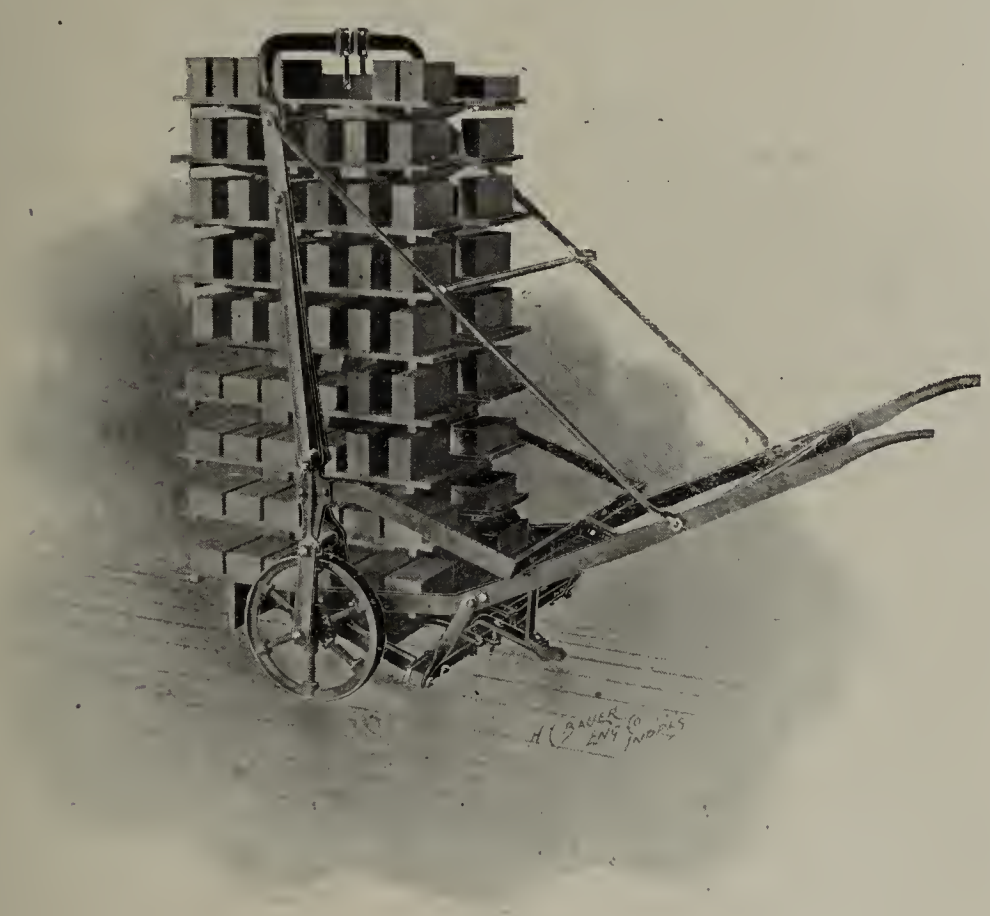
The saving of time is a large item.

Our new Catalogue fully describes this and many other superior points.

Send us your address.



BRICK MACHINE No. 1. (Inside Press.)



RACK No. 1 WITH TRUCK.

THE "MOCK"

Patent Portable Rack and

PALLET SYSTEM.

Saves Labor, Saves Time, Prevents Loss, Increases Profits.

RACK No. 1 here shown, is used in Sun and Air Drying and permits of edging the brick.

RACK No. 2 is similar to No. 1, but lower, carries 120 brick, and is used in gas drying.

Common Pallets are used on these two Styles.

RACK No. 3 is used in either system of drying and carries 120 brick on HACKING PALLETS.

OTHER STYLES for drying by direct heat from coal or wood.

Our SUN and AIR DRIER gives OUT DOOR RESULTS with INDOOR PROTECTION.

CLAY-CRUSHERS, SANDERS, ELEVATORS, DRY PANS, DUMP CARS (all iron)

DUMP CARTS, SAND BARROWS, KILN DOORS (New Design) KILN CASTINGS, BRICK MOLDS,

GAS and GASOLINE ENGINES.

Write for 1900 Catalogue.

Jas. F. Mock & Co.,

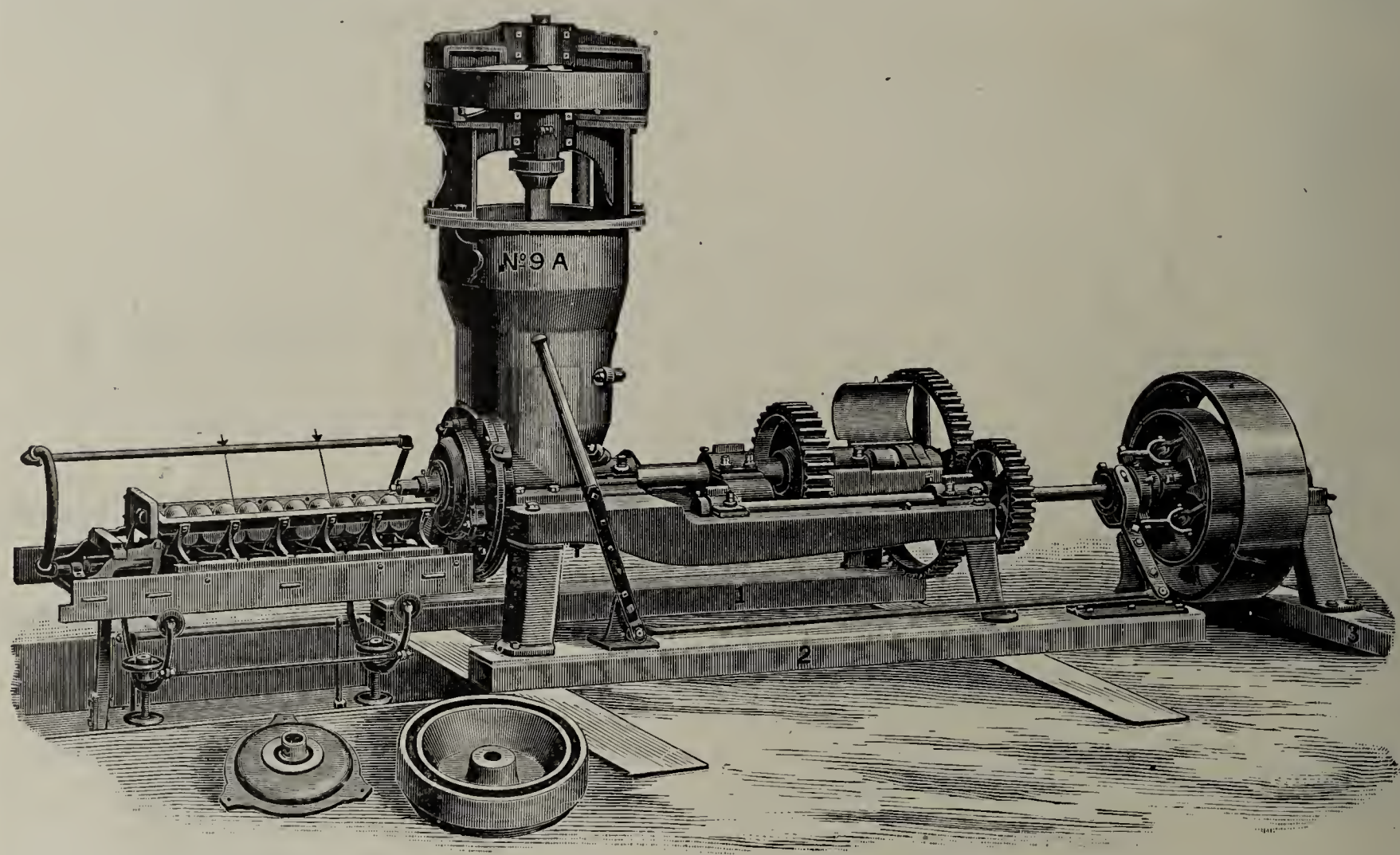
HARTFORD CITY, IND.,

U. S. A.

Tile Machinery Which Has No Peer.

Forty years of experience and the expenditure of thousands of dollars have placed us in a position to offer our machinery to any responsible party and guarantee.

Satisfaction or no Sale.



Our **No. 9A Machine,** Illustrated herewith, for brick or tile has been upon the market for a number of years, and has now the friendship of many experienced users together with unsolicited testimonials by the score.

LET US GIVE YOU PARTICULARS

Concerning this machine and the many others which we manufacture. **REMEMBER THE GUARANTEE.**

H. BREWER & CO.,

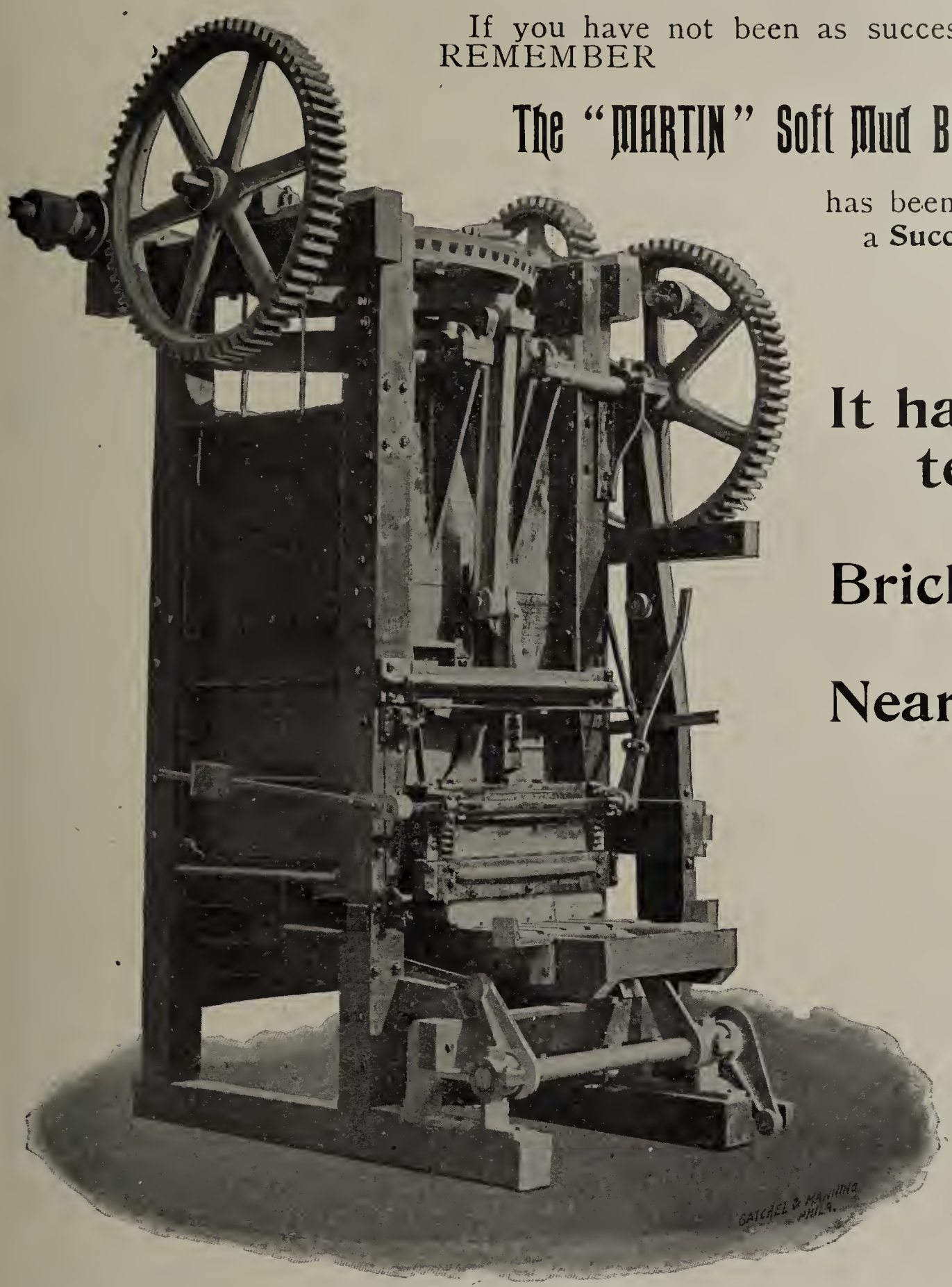
TECUMSEH, MICH., U. S. A.

Start the New Year Right.

If you have not been as successful as many others REMEMBER

The "MARTIN" Soft Mud Brick Machinery

has been the making of many a **Successful Brickmaker.**



It has stood the test of Brickyard life for Nearly half a Century.

Up-to-Date Equipments are OUR Specialty.

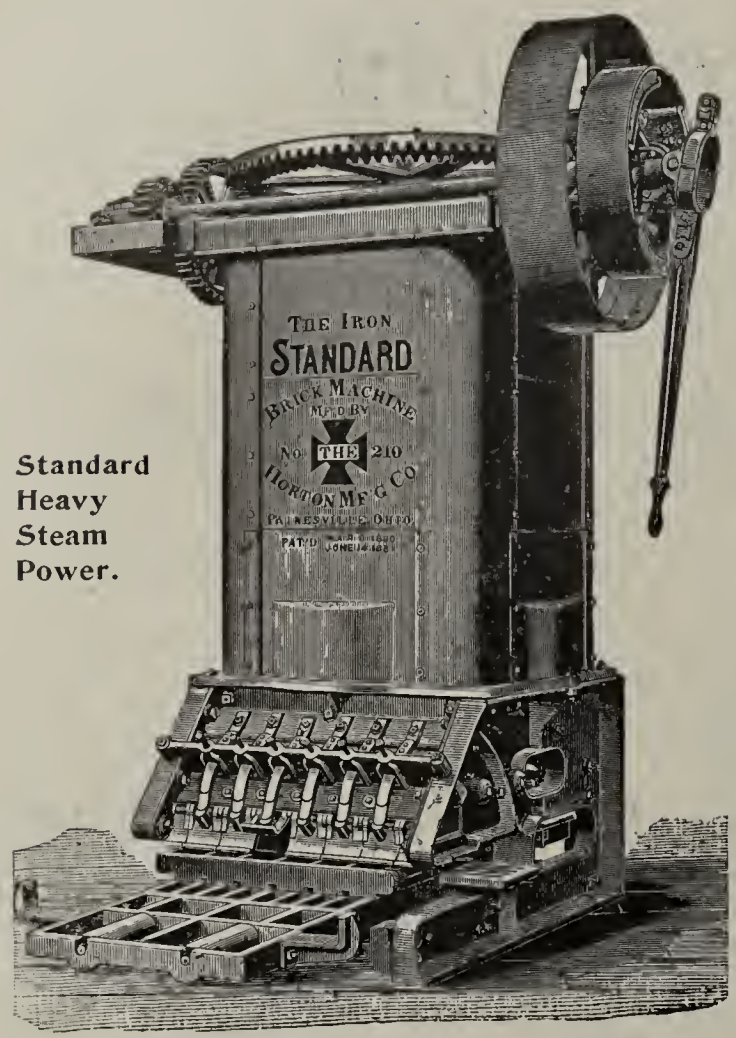
We Furnish Everything a Brickmaker Needs.

Our new Catalogue contains much useful information.

THE HENRY MARTIN BRICK MACHINE MFG. CO., INCORPORATED.

Sole Manufacturers of the "Martin" Patents,

LANCASTER, PENN., U. S. A.



Standard Heavy Steam Power.

We Lead!

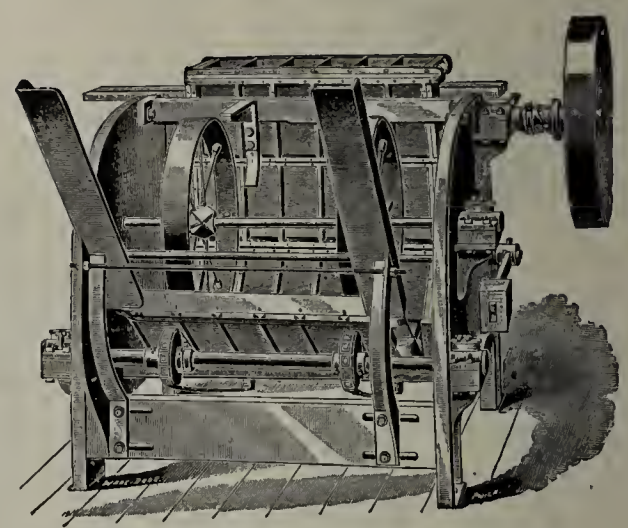
Others Follow!

• • •

The Standard!

Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.



HORTON MOLD SANDER DIRECT FEED

SEND FOR 1899 CATALOGUE.

Erie, Pa., November 17, 1899.

The HORTON MANUFACTURING CO., Painesville, Ohio.

GENTLEMEN—I am using one of your Hercules machines and have had it in operation since April, 1896. It is, in my opinion, the best brick machine in the market; makes very stiff brick, square and perfect in every way. It has an immense power to press, and only takes 30 pounds of steam to run it to full capacity, my repair bill for a year is not worth mentioning. I make an average of 35,000 brick in ten hours and could easily make 50,000 if I cared to put help enough to take care of the brick.

I also have your sander, which sands the molds in a more perfect manner than we can do by hand, and saves me 75 cents every day I have it in operation. I am glad I made that change and put in your sander. It has paid for itself already over and over.

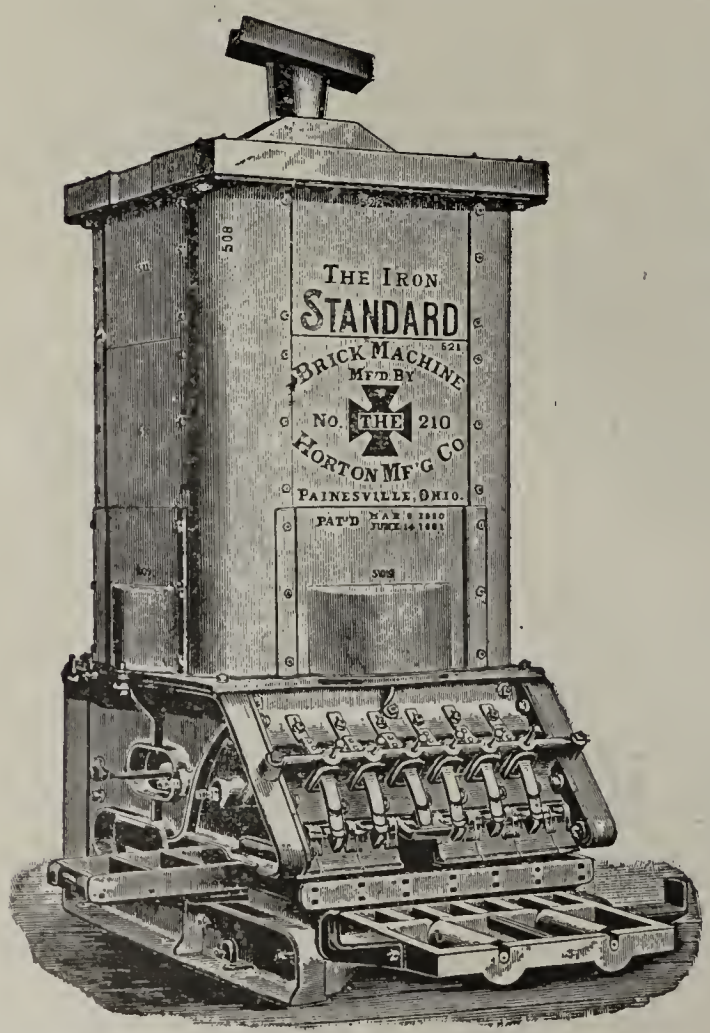
I also have your disintegrator, which works to perfection. I take the clay right from the bank, and it comes through the disintegrator as fine as powder. The few stone in the clay it throws out so I have no necessity to stop the machine in order to remove the stone by hand, as I did with the old smooth roll crusher.

I have made this season 4,400,000 perfect brick, which I think is a very good output.

Any brick manufacturer will make no mistake by taking my advice and buying machinery from The Horton Manufacturing pany Painesville, Ohio, if he wishes to make a full success in the brick business.

Anybody doubting what I have written can convince himself of its truth by calling on me.

Yours truly, FRANK DUDENHOEFFER.



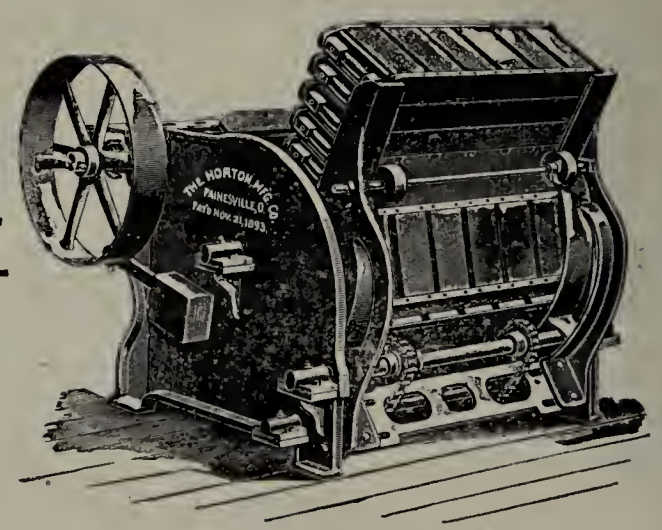
IRON STANDARD HORSE POWER.

WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brickyard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.



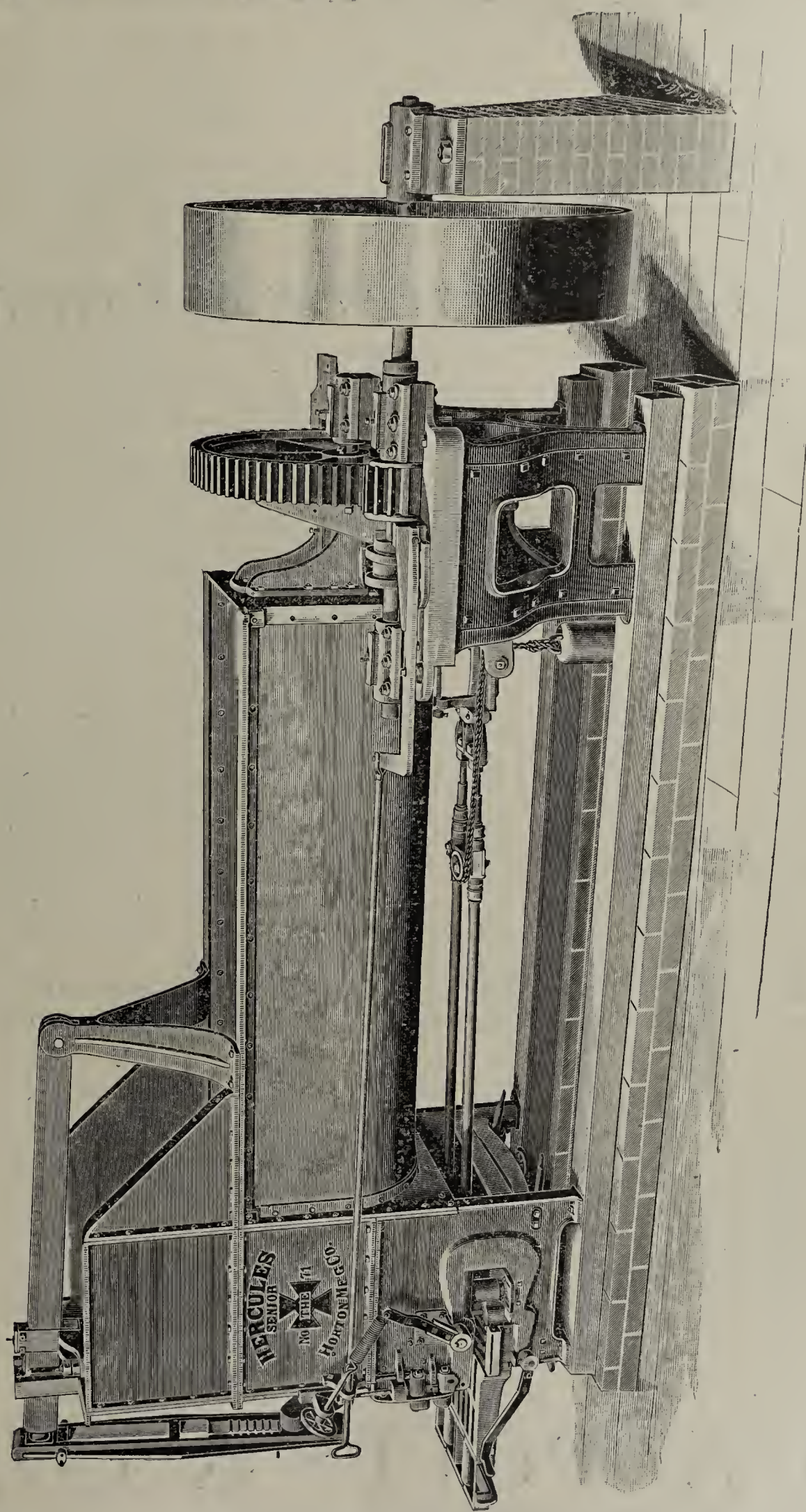
THE AUTOMATIC FEED MOLD SANDER.

LOOK AT THE PICTURE OF

The Best Soft Mud Brick Machine

IN THE WORLD.

HERCULES.



The HORTON MFG. CO.,

PAINESVILLE, OHIO, U. S. A.

WRITE US FOR 1900 CATALOGUE C.

NOTICE.

After nearly eleven years of litigation, during which time the case has been before the Supreme Court of the United States twice, our

Clay Disintegrator Patent

has been adjudged by the United States Circuit Court of Appeals for the Sixth Circuit to be valid and infringed.

We call attention to the following extracts from the opinion of the Court:

We do not find from the evidence that the operation of any of these (older) machines for the disintegration of clay was so successful as to lead to their general adoption by the trade or to work a change in the older and more laborious methods in preparing clay for brick machines, graphically described by Mr. Justice Brown in his opinion.

It is clearly established by the evidence that the Potts Machine is a success.

Nearly all the witnesses who testified to the contrary are prejudiced by their general interest in the litigation, and, **as infringers of complaint's patents,** are contradicted by their conduct. The weight of such evidence, moreover, is much impaired by the trade circulars issued by defendants, showing the success of machines which **infringe** and **Resemble, in every way,** the Potts machine. The operation of the Potts machine described by **Mr. Justice Brown** shows that **it embraces the rapid revolution of the cylinder with longitudinal blades upon it, arranged with reference to the mass of clay to be disintegrated, so that the knives upon the surface of the cylinder shall strike with hard blows the mass of clay and clip off or tear off from the mass presented to the cylinder bits of clay and carry them into receptacle below.**

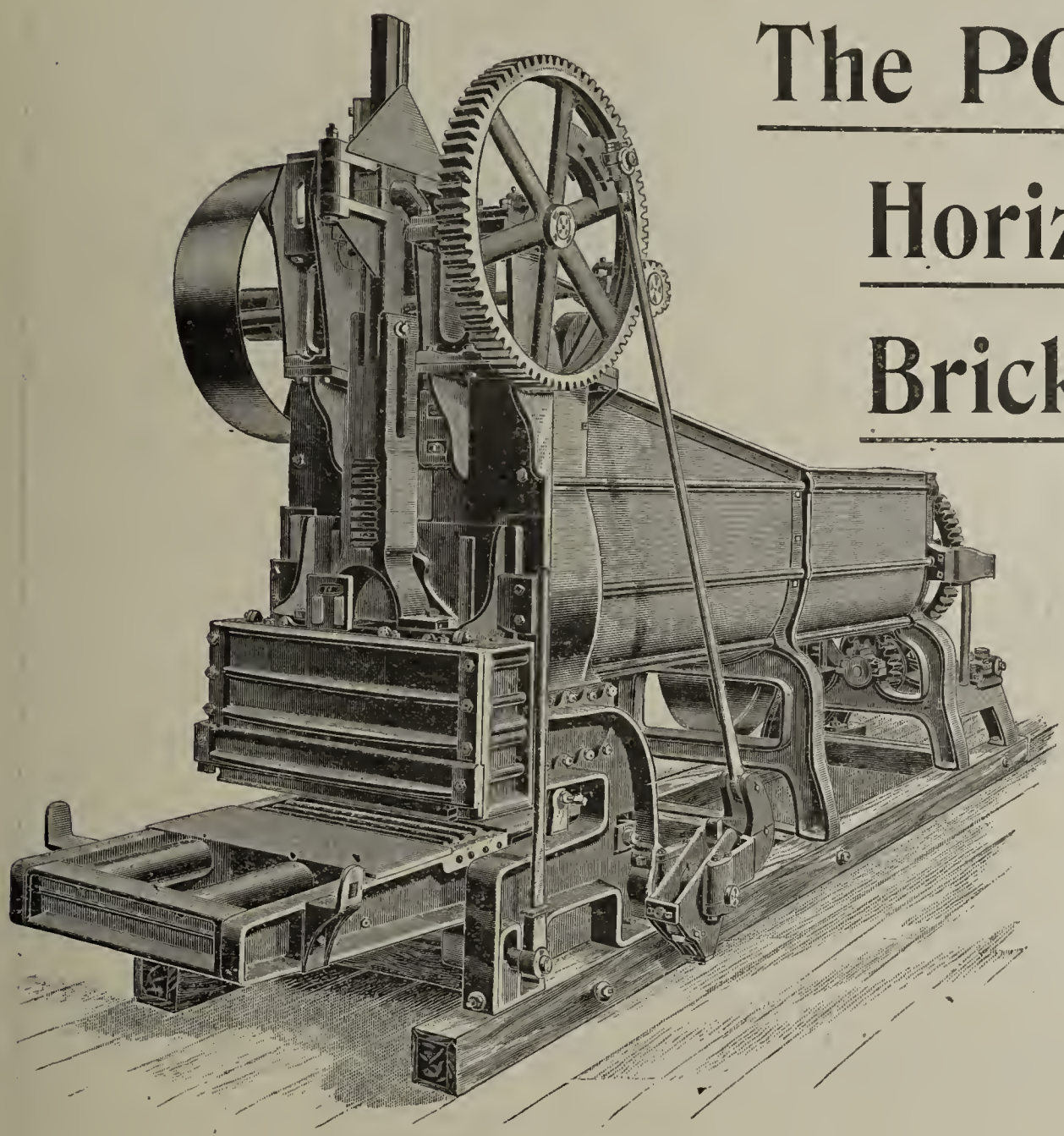
☞Our rights having now been confirmed, both by the Supreme Court of the United States, and by the Circuit Court of Appeals for the Sixth Circuit, all persons are hereby notified that we shall expect said rights to be respected, and that all infringements will be promptly and vigorously prosecuted.

Persons owning or operating infringing machines, which they have bought heretofore, will advance their own interests by promptly settling with us.

C. & A. POTTS & CO.,

Indianapolis, Ind.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

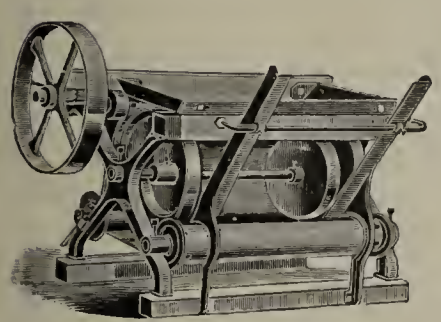
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

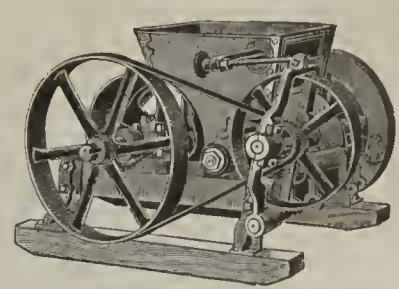
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



DISINTEGRATORS.

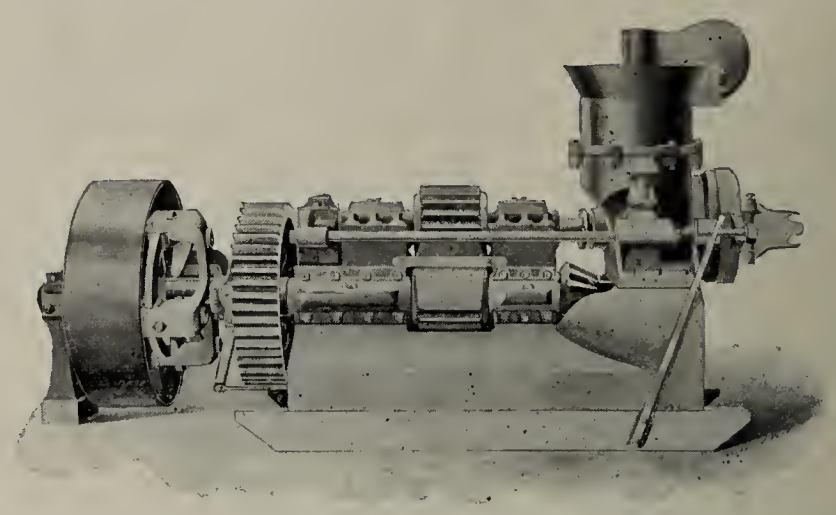
When in need of Machinery or supplies, we can save you money.

C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

END AND SIDE CUT AUTOMATIC BRICK CUTTER.



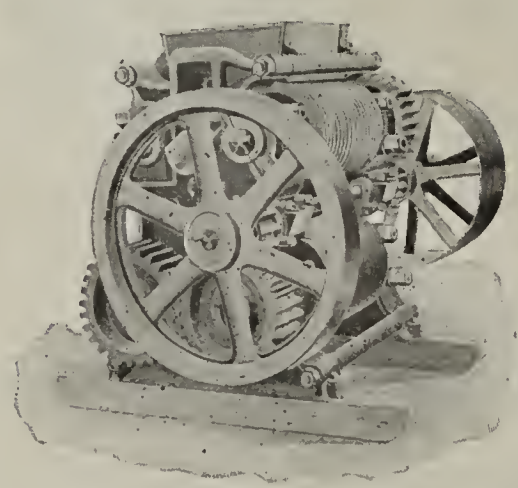
WONDER BRICK MACHINE, made in four Sizes Ranging in Capacity from 25,000 to 100,000 Brick per day of 10 Hours.

Wonder Brick Machinery

IT IS CONCEDED that the best brick paved streets are in Terre Haute, Ind. We invite you to call on the Terre Haute Brick and Pipe Co., and see the **Big Wonder** make the brick. . . .

The Wallace Mfg. Co.,

Frankfort, Indiana.



CRUSHERS AND STONE SEPARATORS, made to Suit Conditions under which they are to work.

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

SEND FOR CATALOGUE.

OPEN AND CLOSED TOP PUG MILLS.
Capacity to suit your Requirements.

A RECORD BREAKER.

THE **Battle Ship Oregon** was not built by the oldest and largest Ship Building Works in the World, but she was a record breaker for low cost for repairs. So with the **Wonder Brick Machines** as the following letter testifies. This is the second Season this machine has been run.

GRAND RAPIDS, MICH., July 22, 1899.

THE WALLACE MFG. CO.,
Frankfort, Ind.

Gentlemen:—Will you please send us by freight the two knives that fit on the horizontal shaft, Big Wonder, as the old ones are badly worn. Also send us your catalogue price list.

We are making 50,000 brick per day regularly on the Big Wonder. Have not started up any of our other machines this season, as the one machine fills our yard completely, which holds as you know 500,000 brick, requiring two gangs of wheelers and setters. We have never broken so much as a bolt, closed down the machine a minute for readjustment, or paid out one dollar for repairs since starting. We wish you abundant success.

Very respectfully yours,
GRAND RAPIDS CONSOLIDATED BRICK & TILING CO.

You will find seven **Wonder Brick Machines** in Grand Rapids and vicinity.

The Wallace Mfg. Co.,

CHICAGO AGENTS:
CHICAGO BRICK
MACHINERY COMPANY,
Chicago, Ill.

Frankfort,
Indiana.

Merit, Not Luck . . .

A YEAR AGO we called attention to the fact that thirteen Eagle Represses were working in Galesburg, Ill. We ridiculed the assertion that "13" was an unlucky number and defied the bad omen. Part of what was said is shown in the paragraph in the corner of this page. Read it. Merit has knocked out the "13." Two more Eagle Represses have been sold in Galesburg, and now 15 Eagles will work there, giving abundant satisfaction and testifying more strongly than words the merits of the Eagle. Galesburg is the paving brick city of the World. It turns out more pavers than any other. Every repressed paver in Galesburg will be pressed on an Eagle Repress. No other Repress will be used in Galesburg after these two Eagles are delivered. Isn't this a record to be proud of? Doesn't it suggest to you that the Eagle must be the best machine?

The two new Eagles will succeed three other presses of another make in the Purington plant. Two Eagles will do the work of three others. This will make nine Eagles in the Purington Factory. It was a question of economy with the Purington people. Speaking of the matter they say that the three presses of another make have cost for repairs three times their original price, while the seven Eagles have cost practically nothing. It's evidently economy to have the Eagle because it's the best. It's built for profit to the buyer. Does as much and more than we promise. Does it better and faster and at less cost. Send for particulars on the Eagle or any other Clay-Working Machinery.

13 The Unlucky Number 13

That is the number of Eagle Represses we have in operation in Galesburg, Ill. We don't consider 13 an unlucky number! There were 13 original States. See what a grand Nation has grown from this nucleus of 13. The American Eagle perched proudly upon the American Shield, originally screamed for but 13 stars and bars. Today there are 45 stars upon our flag. Why, then, should we fear the omen of 13? We are proud that the Eagle of The American Clay-Working Machinery Co. should be perched over 13 of the American's Eagle Represses in Galesburg. There are other manufacturers—several of them—who would be glad of the opportunity to brave the superstitious omen under similar circumstances. It's not a question of luck, but of merit. People who use the Eagle Repress are pleased with it. When they enlarge they buy another, and so it goes. In Galesburg the 13 Represses are, every one, giving the best of satisfaction. That's the way with all our machinery. You buy it and are satisfied—not only today, but the next year and the next decade.

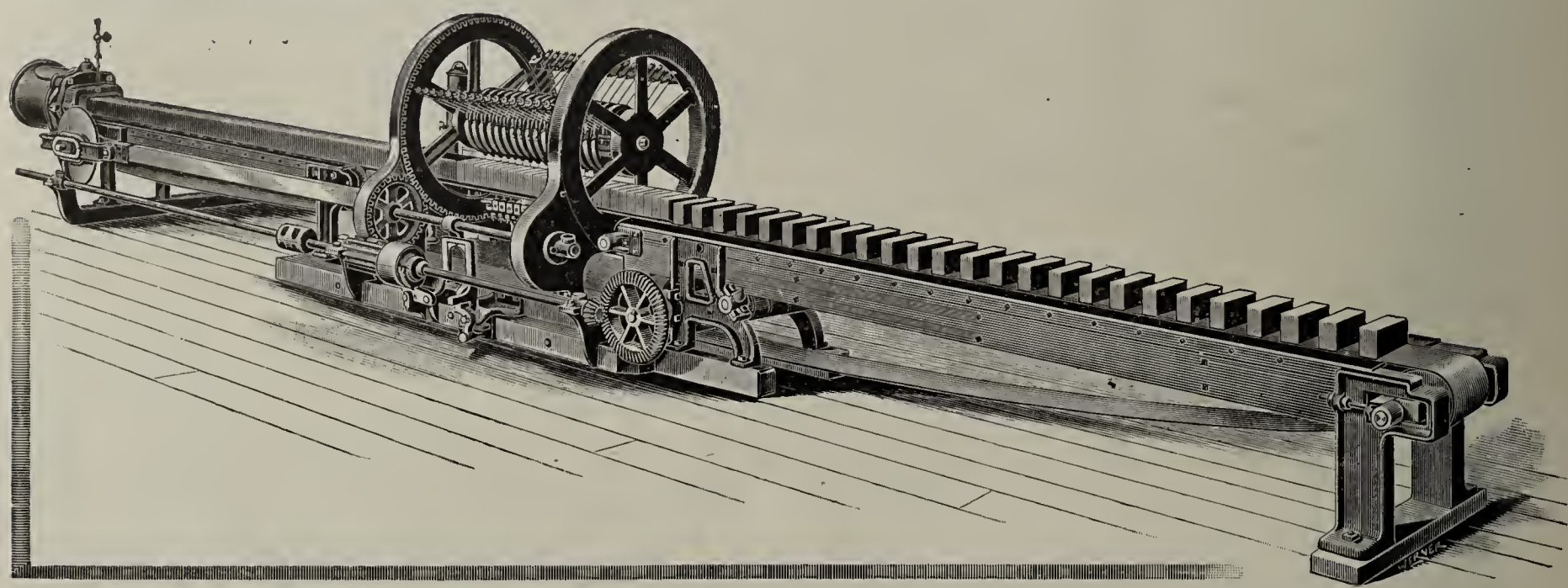
The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

The Bucyrus Steam Tunnel Dryer
THE BUCYRUS STEAM TUNNEL DRYER
IF YOU ARE LOOKING FOR A DRYER THAT WILL REMOVE MORE MOISTURE IN LESS TIME, WITH LESS FUEL THAN ANY OTHER DRYER ON THE MARKET THEN WHAT WE SAY AND WHAT USERS OF THE BUCYRUS DRYER SAY WILL INTEREST YOU.
WRITE US.
IT WORKS WHILE YOU SLEEP.
THE DRYER THAT DRIES.
MANUFACTURED BY
THE AMERICAN CLAY WORKING MACHINERY CO.
BUCYRUS, OHIO, U.S.A.
EQUIPPERS OF COMPLETE CLAY-WORKING PLANTS

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

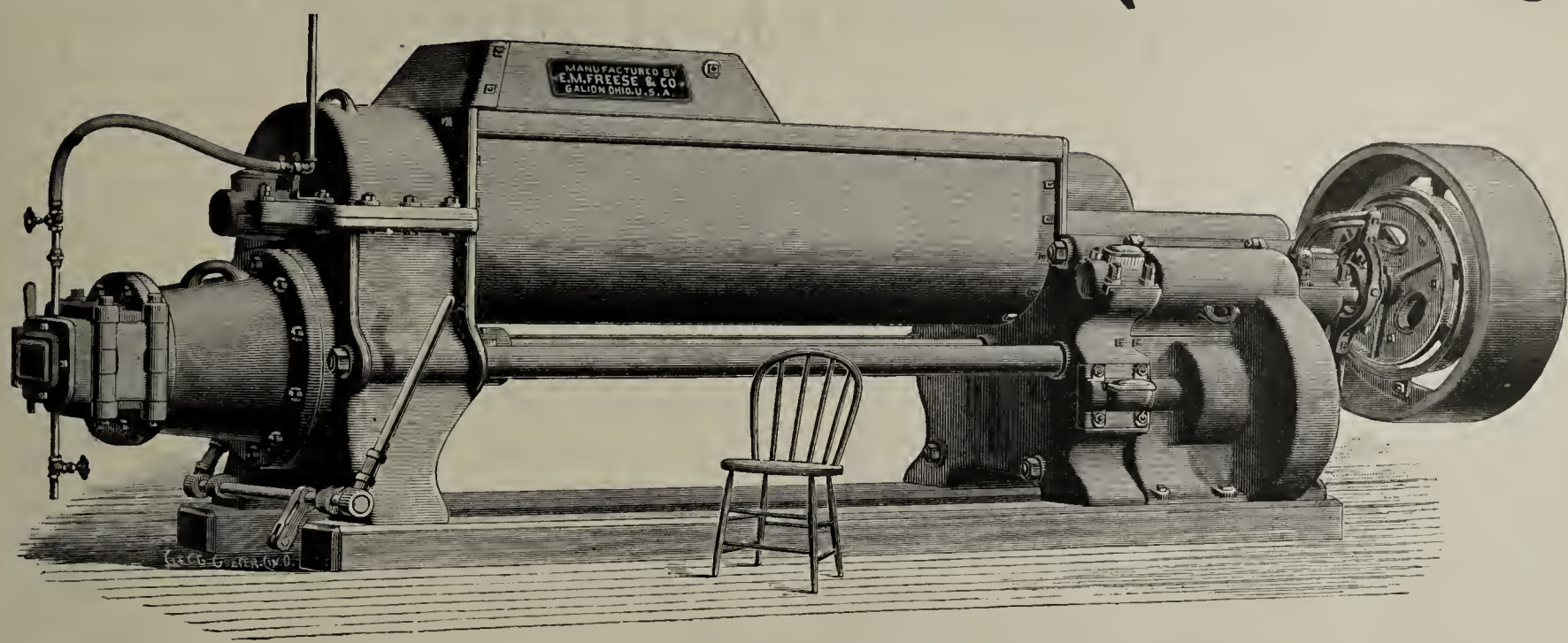
POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

E. M. FREESE & CO.,

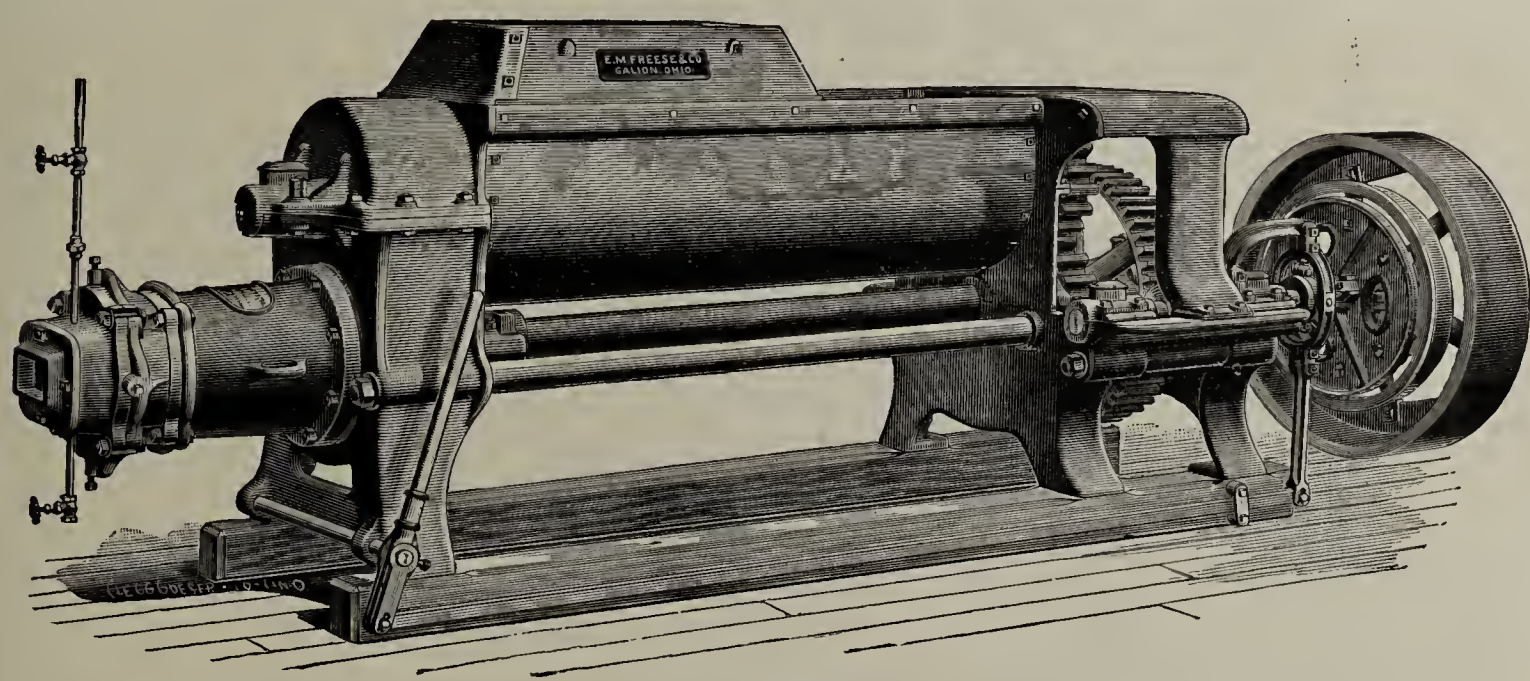
Galion, Ohio.

The Original Union Brick Machines



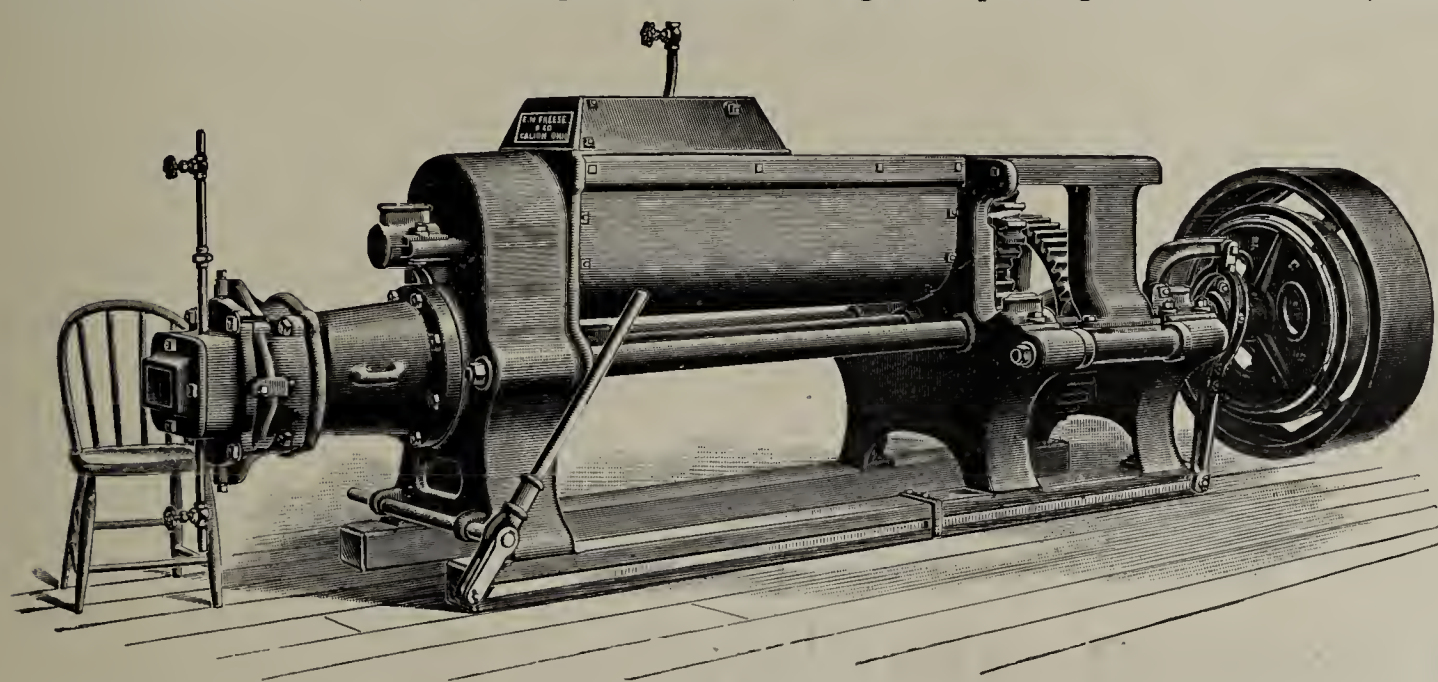
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

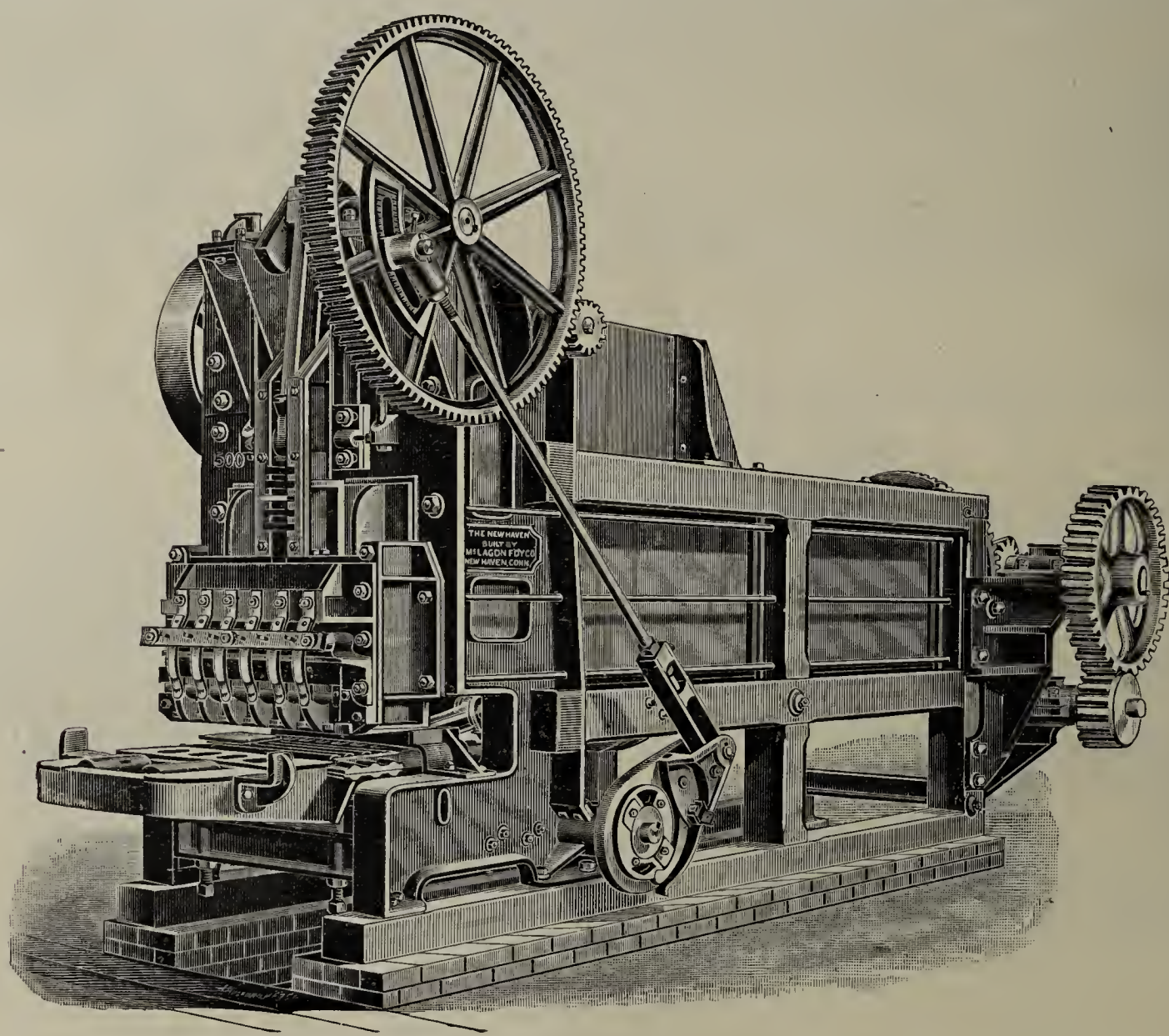
No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

One Million Brick a Month The Year Through.

To Make Soft Clay Brick at that Rate the Machine Cannot be Idle Because of Breakages very much of the Time.



Mechanicville, N. Y., Nov. 11th, 1899.

The EASTERN MACHINERY CO., New Haven, Conn.

Gentlemen:—Replying to your letter regarding the running of the **"NEW HAVEN" Machines,** we will not take much room in your catalogue to say all that we have to about them.

We started the first machine March 21st, '98, and have made on that machine to date **Twenty Millions of Brick, which is practically one million a month the year through. The other machine is doing the same amount and has the possibilities of same record.** Machines that will do that amount of work are good enough for us.

Yours very truly, BEST BRICK CO.,

W. N. CAREY, Sec'y.

PERHAPS YOU MAY BE LOOKING FOR A MACHINE OF THIS KIND.
AT ANY RATE WE WILL BE GLAD TO HAVE YOU INQUIRE ABOUT THEM.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

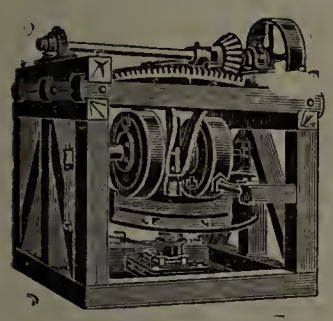
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

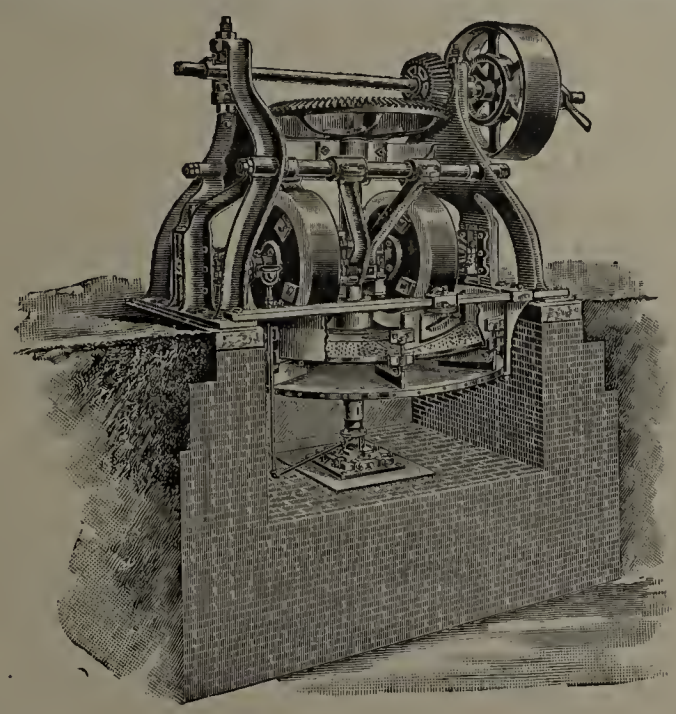
MANUFACTURERS OF

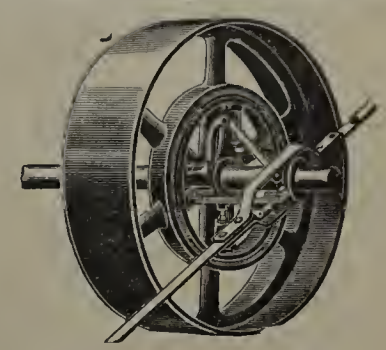
Brick Machinery.

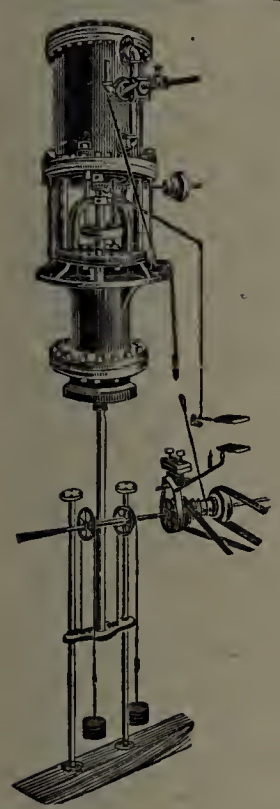
COMPLETE EQUIPMENTS.

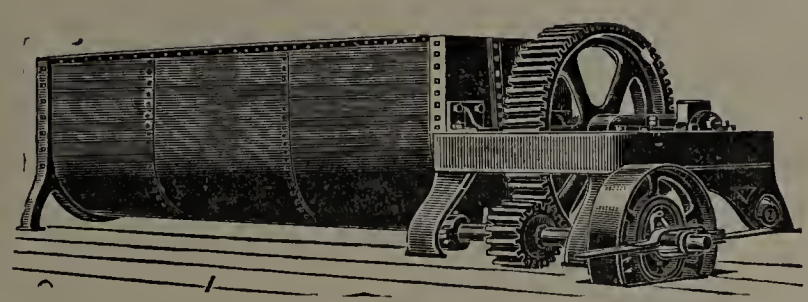
Tile Machinery

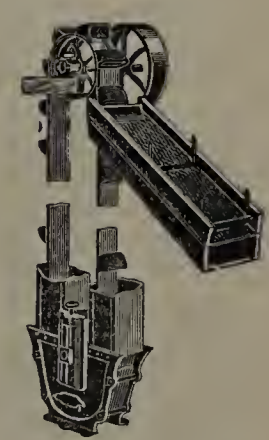












Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

How Much

Does it cost you to make and dry your Brick? ?

Give us an answer to this question, and we will tell you how much we can reduce it for you.

Won't you send for a copy of our Catalog?

American Blower Company,

Detroit, Michigan.

New York. Chicago. London.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS, OHIO, U. S. A.

MANUFACTURERS OF ALL KINDS OF

Clayworking Machinery.

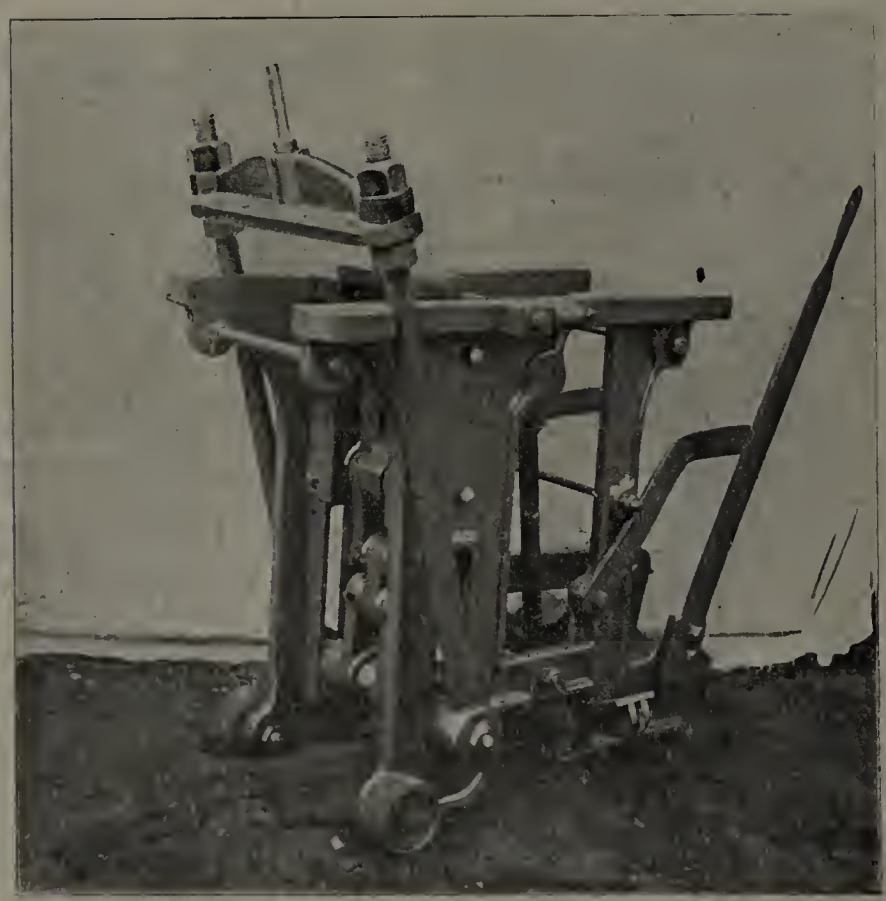
The accompanying cut shows our improved machine for making

Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES, GRINDING PANS (Wet and Dry.) PUG MILLS, Etc., Etc.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



NEW IMPROVED SINGLE MOLD HAND REPRESS.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

Pullman, Wash., Aug. 16, 1899.

OHIO CERAMIC ENG. CO., Etc.:

Enclosed find draft for double mold hand repress. Machine giving good satisfaction, in fact like it better every day. We are making eight thousand (8,000) per day easily for past month.

Your truly, A. J. EASUM & CO.

Girard, Ill., May 29, 1899.

OHIO CERAMIC ENG. CO., Etc.:

Please find draft for double mold hand-press enclosed. It works O. K.

Respectfully yours, B. F. THOMPSON.

Somerset, Mass., Aug. 29, 1899.

OHIO CERAMIC ENG. CO., Etc.:

In reply to your favor of the 21st, we will say that the single mold press that we bought of you is doing good work on brick 9 by 10 by 2 inches, and it is very satisfactory in every respect. The brick we are making are very difficult to press, having six deep slots nearly the whole length of the brick, also a deep panel in the back. We get about 2,000 per day of these bricks. We think we could make 5,000 per day of 4½ by 9 inch.

Yours very truly,

C. E. HATHAWAY & SON.

OUR TESTIMONIALS SPEAK VOLUMES FOR THIS MACHINE. INVESTIGATE ITS MERITS BEFORE ORDERING.

We also make a Double Mold Hand Repress.

The Ohio Ceramic Engineering Co.,

Cleveland, Ohio.

Table of Contents, Page 181.

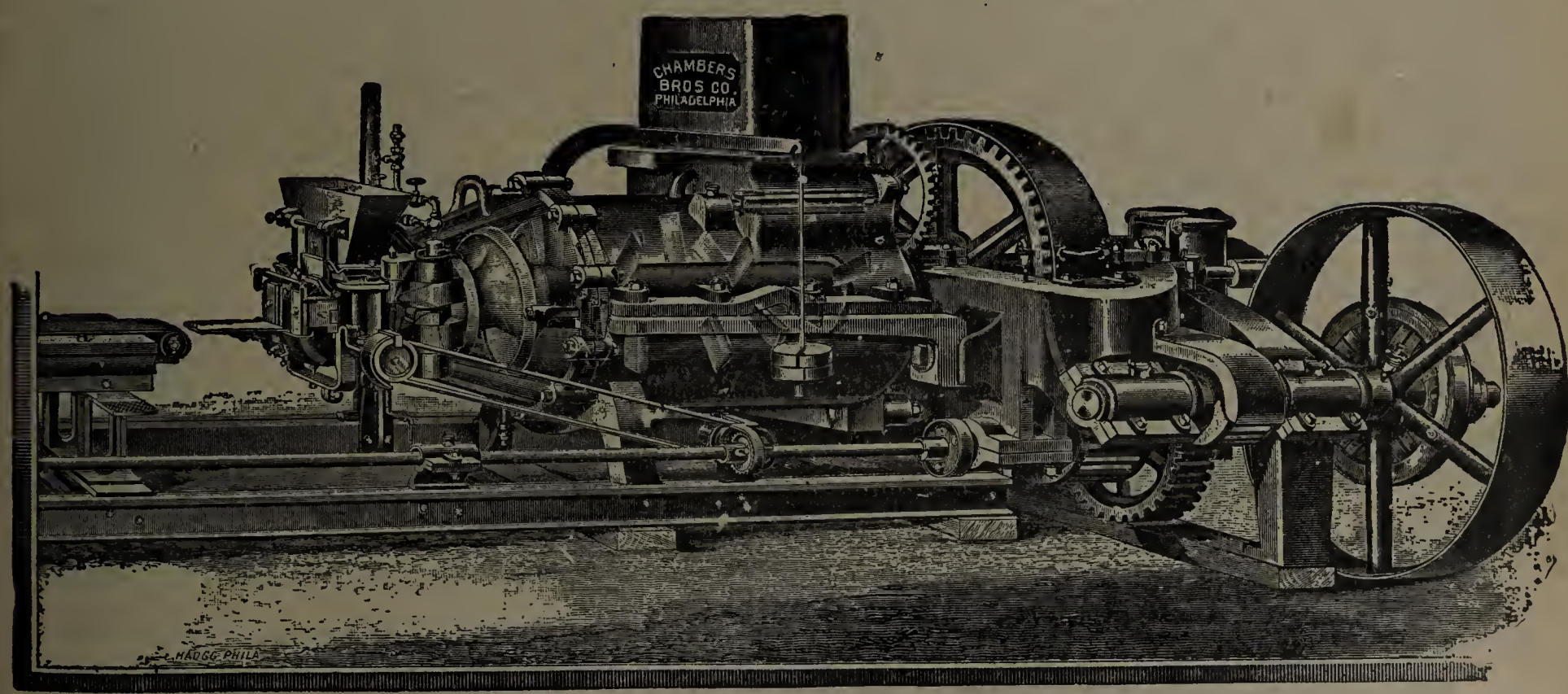
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII, No. 2. INDIANAPOLIS, IND., FEBRUARY, 1900. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

The Atlas Bolt & Screw Co., Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

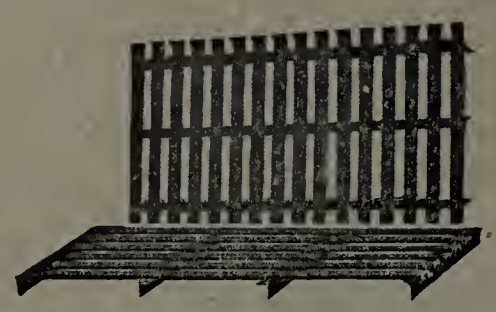
We are the Largest Manufacturers of Dryer Cars in the World.

Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.

No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

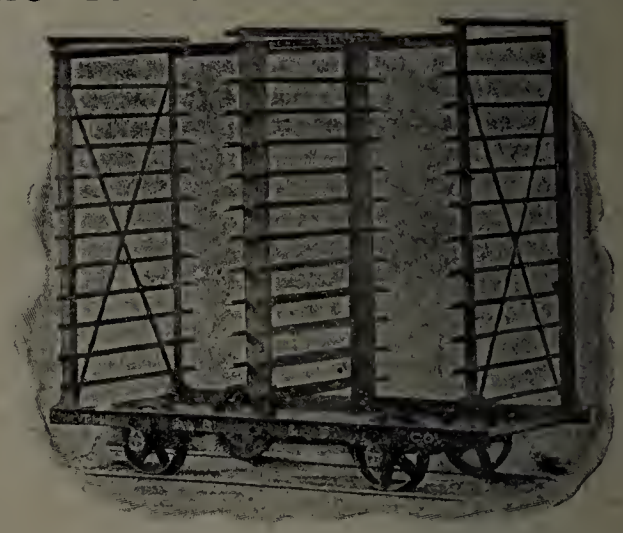
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet 7 inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name. Page.
American Clay-Working Mach Co, The 218, 219
Anderson Foundry and Mach. Works 98, 294
Chisholm, Boyd & White Co, ... 96, 97
Chicago Brick Machinery Co ... 100
Many, Frank B 192
Fernholtz Brick Machinery Co. The 101
Progress Press Brick and Machine Co 189
Ross-Keller Brick Machine Co. 99
Western Machinery & Supply Co 193

Brick and Tile Machinery.

Adrain Brick & Tile Machie Co. 201
American Clay-Working Mach Co., The 218, 219
Anderson Foundry and Mach. Works 98, 204
Baird and Son, H. C 195
Brewer, H. & Co 212
Chambers Brothers Co 93
Chicago Brick Machinery Co ... 100
Eastern Machinery Co, The 222
Fate & Co., The J. D 213
Freese, E. M. & Co 220, 221
Henry Martin Brick Mach. Mfg Co, The 209
Hensley, J. W 95
Horton Mfg Co, The 210
Kells & Sons 195
Leader Mfg. Co, The 205
Madden & Co 193
Mock & Co., Jas. F 211
Ohio Ceramic Engineering Co., The 187, 224
Potts & Co., C. & A 214, 215
Prangley, James 204
Raymond Co., The C. W 182, 183
Steele, J. C., & Son 200
Stevenson & Co 223
Taplin, Rice & Co 100
Wallace Mfg. Co, The 216, 217
Wellington Machine Co, The ... 185
Wiles Co., A. M. & W. H 200

Brick Kilns and Dryers.

Alsip, S. H 191
American Blower Co, The 224
Bushong, M. M 203
Carson, J. W 196
Eudaly, W. A 203
Haigh, H 202
Illinois Supply and Construction Co, The 189, 207
Morrison & Co., R. B 202
Phillips, S. G 192
Pike, E. M 194
Reppell, L. H 202
Standard Dry Kiln Co, The 102
Yates, Alfred 193

Brick Yard Supplies.

Atlas Bolt & Screw Co, The 91
Arnold, D. J. C 200
Buhl Malleable Company 192
Cleveland Car Co 206
Caldwell & Son Co., H. W 193
Carmichael, T. W 195
Carnell, Geo 200
Coldewe & Co., G 195
Cox, Geo. S 196
Duplex Heating & Machine Co. 201
Elder & Dunlap 196
Frost Engine Co 208
Hardin & Gray 197
Harrington & King Perforating Co, The 95
Henry Martin Brick Machine Mfg. Co, The 209
Horton Mfg. Co, The 210
Jeffrey Manufacturing Co, The. 197
Kendall & Flick 181
Marion Steam Shovel Co 205
Main Belting Co 192
Mershon & Co., W. B 194
Newton, A. H 197
Newton A. C 197
Phillips & McLaren 194
Rockwood Mfg. Co, The 193
Turner, Vaughn & Taylor Co ... 224
Vanduzen Co., The E. W 193
Williams Patent Crusher and Pulverizer Co 101

Miscellaneous.

Burt Manufacturing Co 181
Chesapeake & Ohio R. R 197
Clinton Paving and Building Brick Co., The 199
Coaldale Brick & Tile Co., The . 198
Cotton Belt Route 195
Dean Bros. Steam Pump Works 195
Dover Fire Brick Co 196
Evens & Howard 193
Gabriel & Schall 192
Green & Hunter Brick Co 198
Henry Carey Baird & Co 194
Harper-Norton Shale Brick Co The 198
Higley & Co, J. L 199
Indianapolis Engraving and Electro Co 194, 197
Indiana, Decatur & Western ... 195
Illinois Central R. R 196
Lake Erie & Western 195
McAvoy Vitrified Brick Co 199
New York Brick and Paving Co 198
Osborne, W. R 193
Philadelphia Commercial Museum, The 196
Pennsylvania Line 197
Purington Paving Brick Co, The 199
Terre Haute Brick and Pipe Co. 199
Vandalia Line 197
Westbrook & Wells 196
Ads., Small Wanted, For Sale, etc.

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

Samples or blue prints with prices furnished on request.

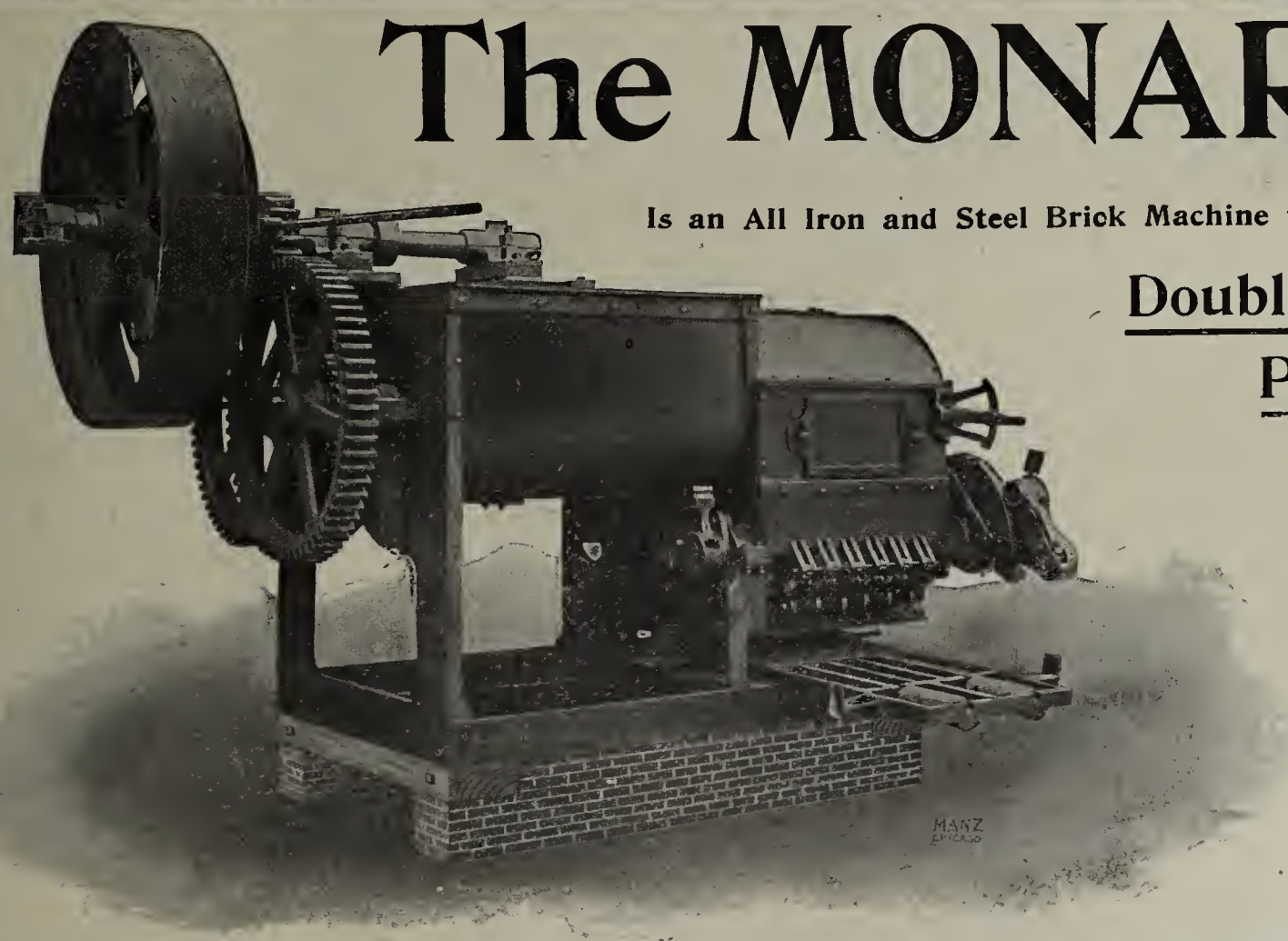
THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.

• • •



SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER. **Indianapolis, Ind.**

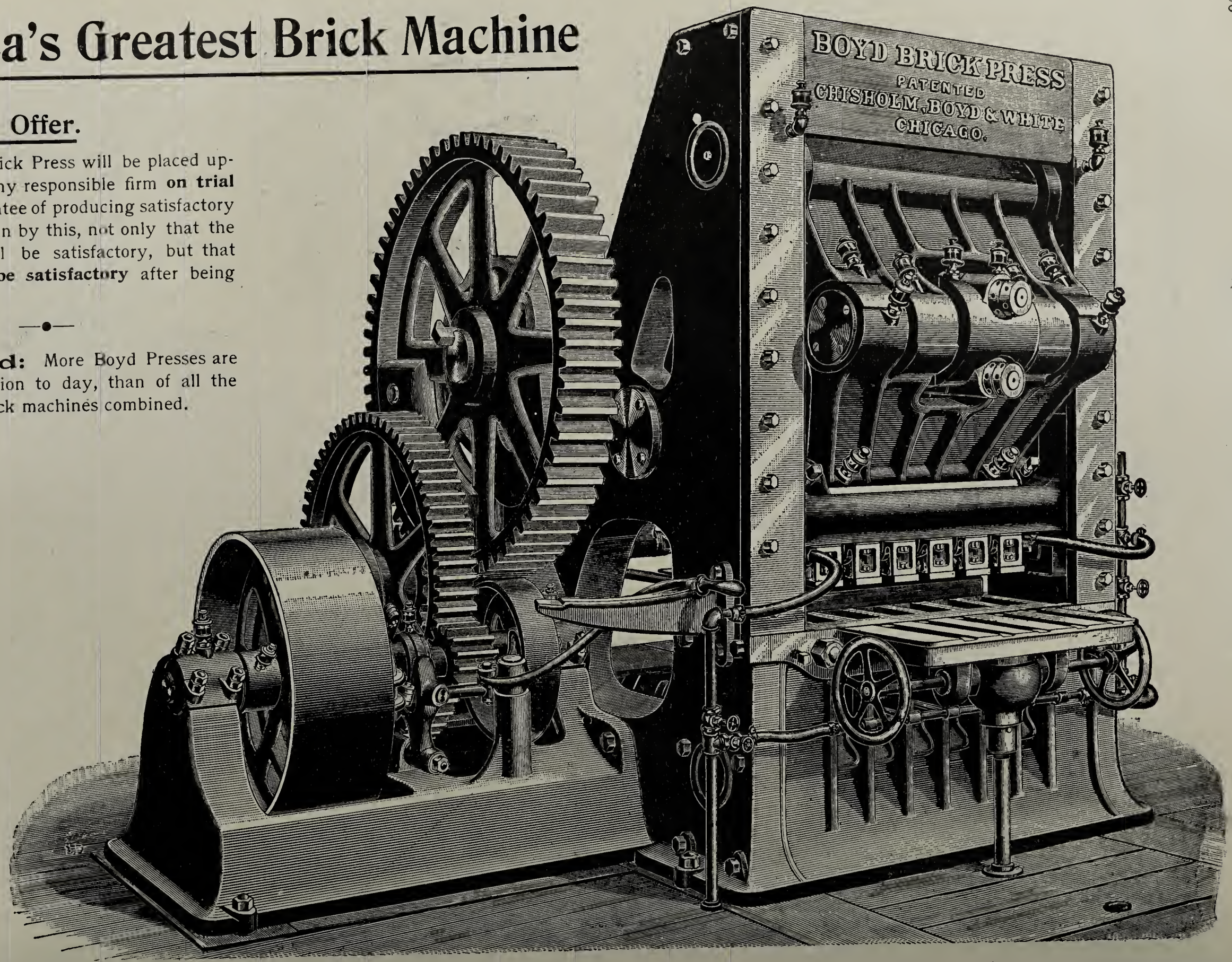
W. L. KIDNEY, Sales Agent, Capetown, South Africa.

America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets.

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Powerful Pressing Mechanism of the Boyd Press Lasts Forever.

Great for Strength.

The engraving shows the heavy forged steel Side-Bars, the Toggles, the upper and lower Crossheads, with the plungers in position. These comprise the "pressing mechanism" of the Boyd Brick Press, and take all the strain exerted in pressing the bricks in the molds between the plungers. They can never wear out and cannot be broken. These pressing parts are suspended upon the lifting levers, and the side frames of the press only guide the side-bars in their upward and downward movements.

Great for Beauty.

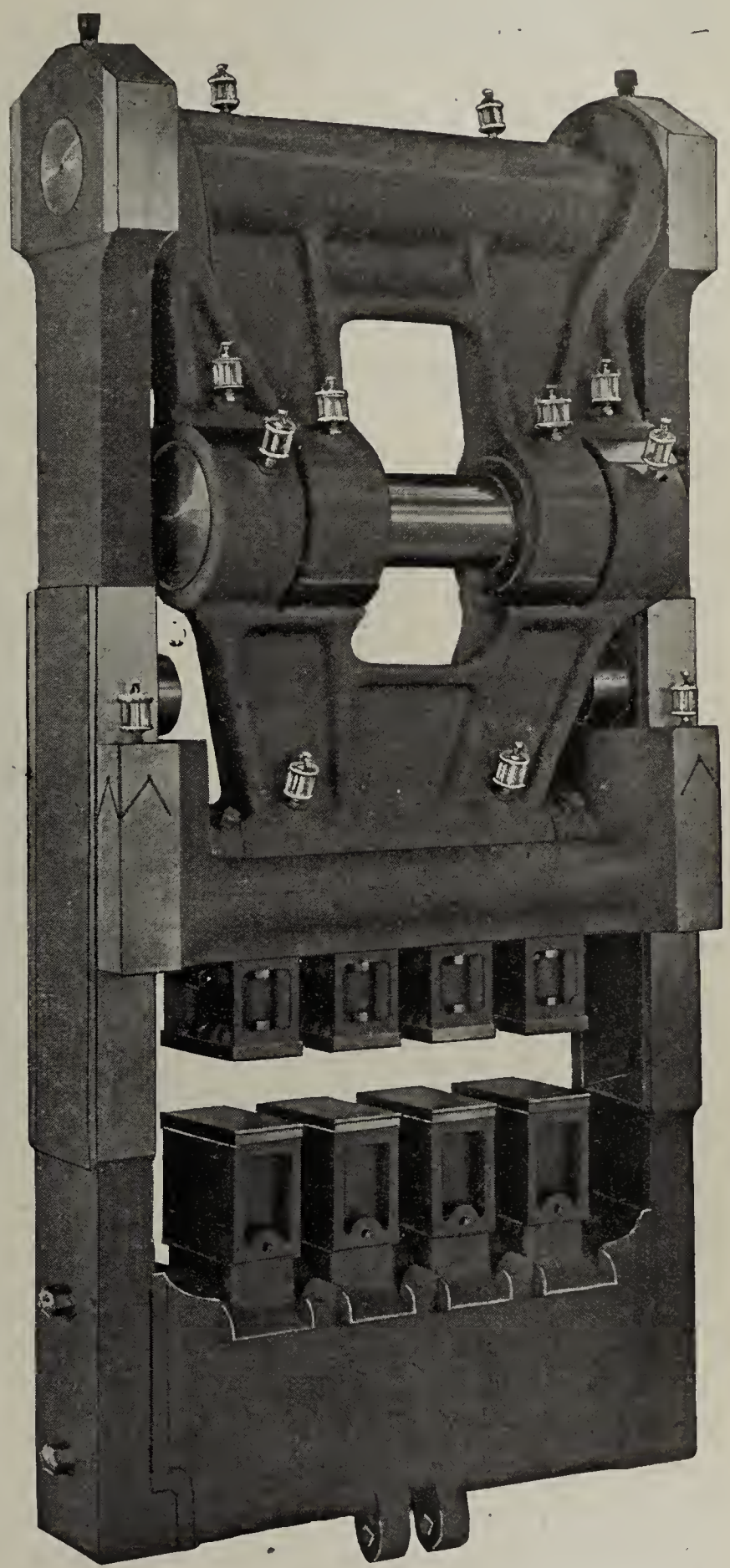
The symmetrical design of the Boyd Brick Press gives it the strength and beauty for which it has always been distinguished. The housing or stand, which contains the driving pulley and intermediate gears, is bolted to the main frame as shown. Each press rests on the floor line, is self-contained and does not need to be bolted or fastened to its foundation.

Noiseless.

No strain is exerted upon the side frames of the press. The movement of the Boyd Press is noiseless and without jar or shock. No buffers, air cushions, hooks, latches, or other uncertain mechanism are required or employed. There is nothing to get out of order. The mold liners are the same for and will fit each size press. They can be taken out and replaced, or ornomental molds set in without removing any of the working parts of the press.

No Pitman-Lever.

The Modern Boyd Press has no **Pitman-Lever,** though we have the only valid Patents on Pitman-Lever Presses. Eight and ten years ago we built Pitman-Lever Presses, but none since 1891, when it was superseded by the Improved Boyd. Nobody now wants a Pitman-Lever Brick Press, can't afford to use one. We will tell you why if you want to know. So could some of our first customers.



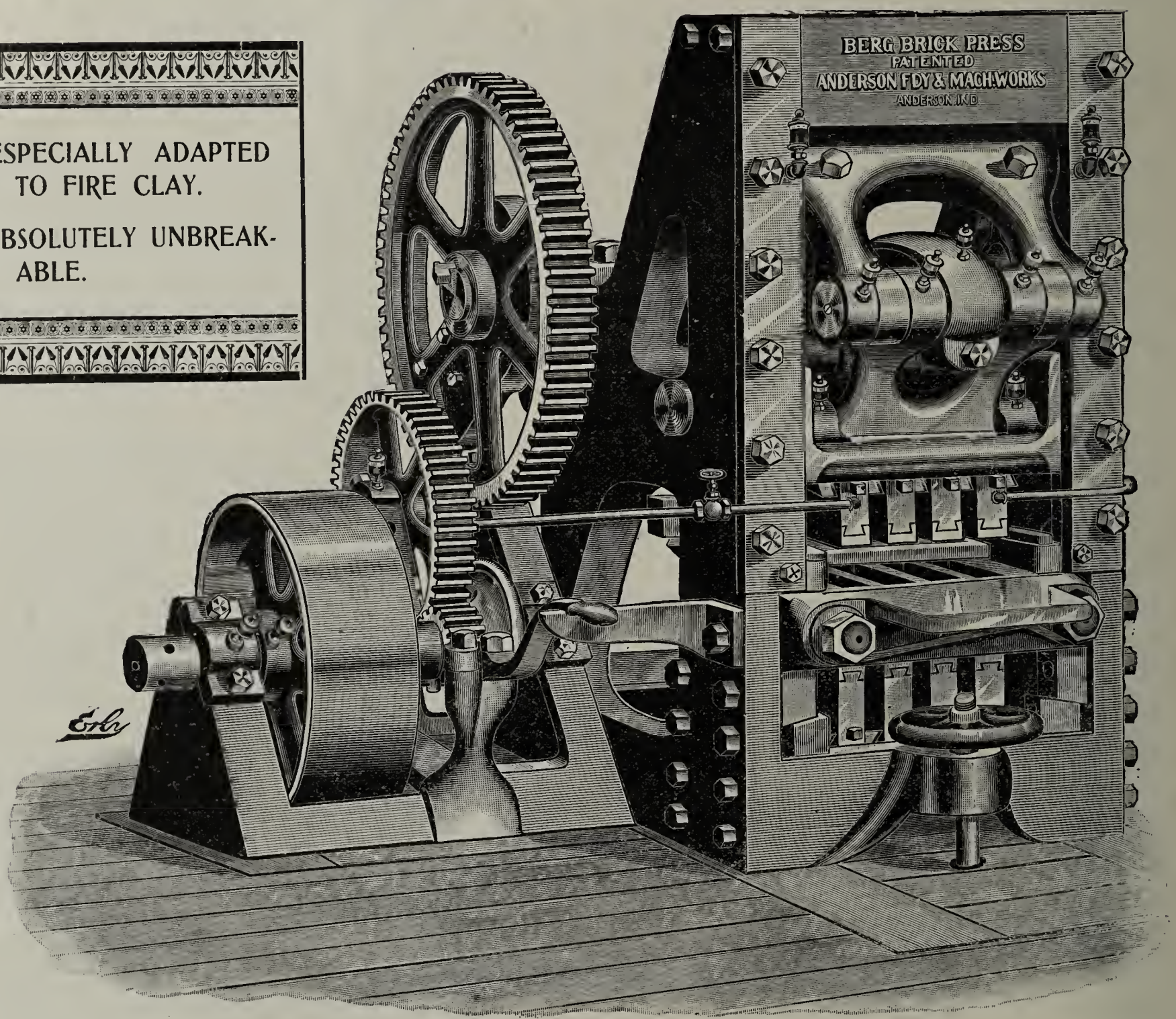
CHISHOLM, BOYD & WHITE COMPANY,

OFFICE AND WORKS: 57th and Wallace Streets. CHICAGO, U. S. A.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY
Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

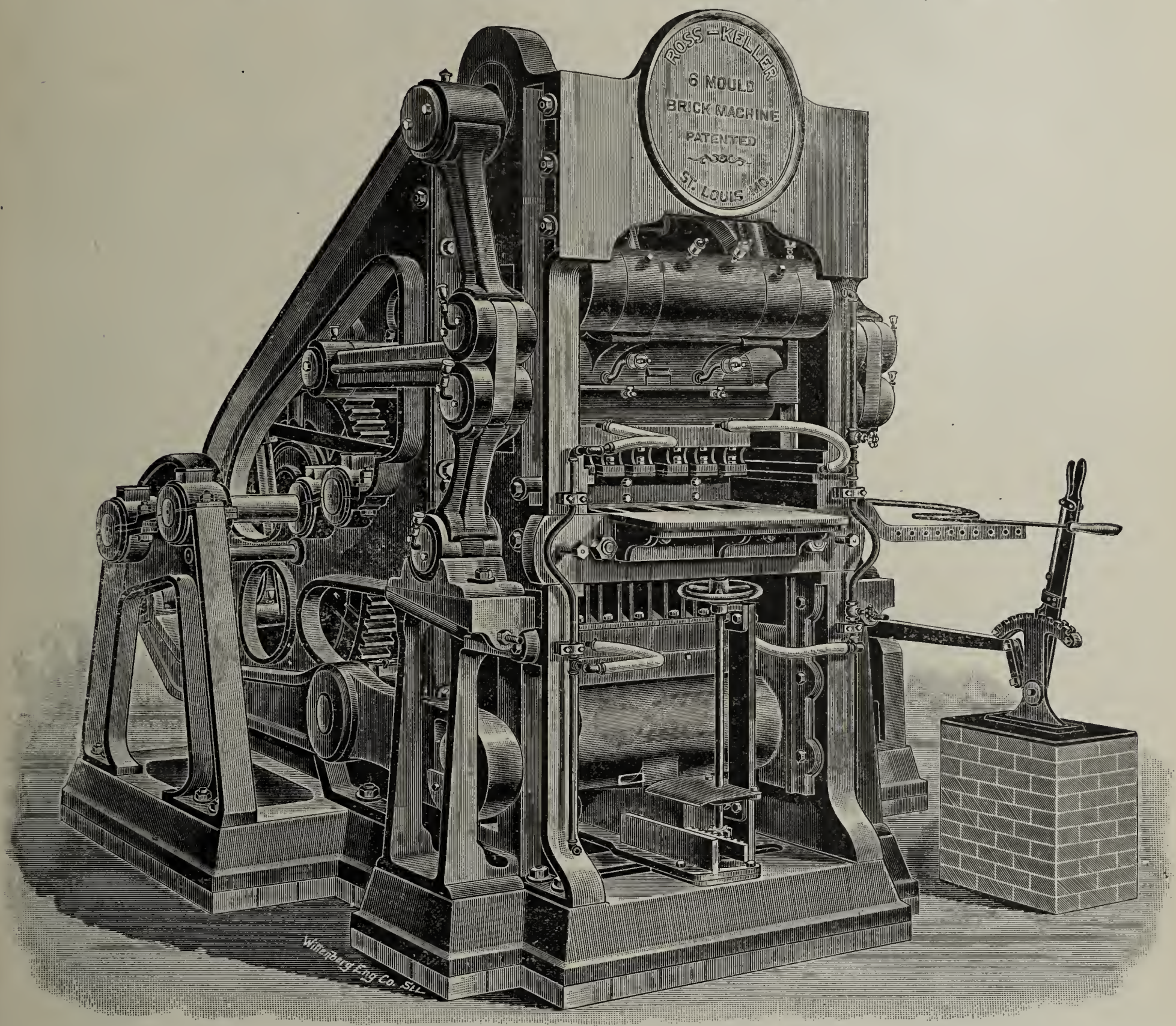
MANUFACTURED BY
The Anderson Foundry & Machine Works,
Anderson, Indiana.

The Latest Improved

Ross-Keller TRIPLE PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 35,000 to 40,000 brick per day.

BRICK SET IN KILN DIRECT FROM MACHINE.



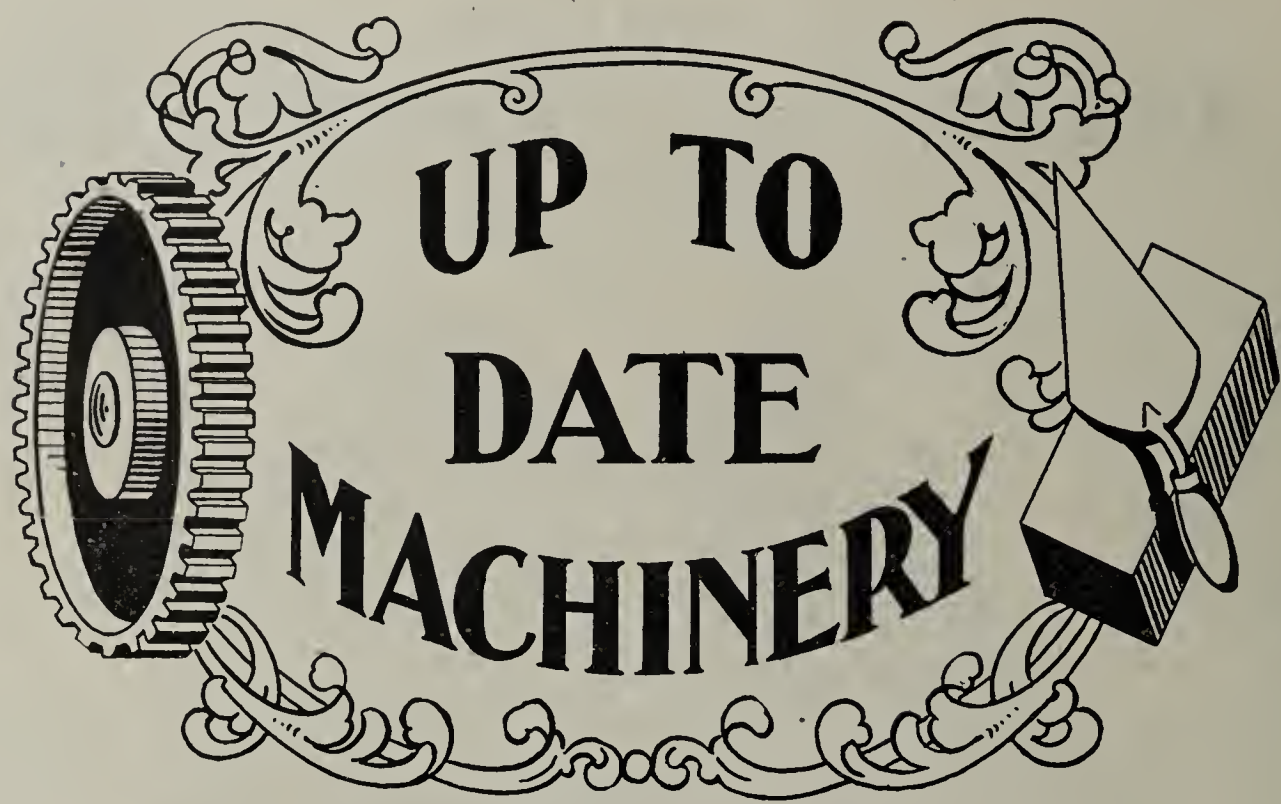
"The Proof of the Pudding is in the Eating."

THE ROSS-KELLER BRICK MACHINE is not "pronounced by the United States Government the highest development of the **Art**" of brick making machinery. But the United States Government **DID** on the 24th day of October, 1898, "pronounce" to the world that the ROSS-KELLER MACHINE was the best "development" to be used by it for the manufacture of forty million pressed brick to be used in the construction of the new United States Penitentiary at Ft. Leavenworth, Kan., as was evidenced on that day, when bids from all of the makers of pressed brick machinery were opened, and after a thorough examination of the different machines in practical operation, **DID** purchase at the highest bona fide bid, the ROSS-KELLER MACHINE. For particulars regarding the working of this machine during the first year, we respectfully refer to the Hon. R. W. McClaughry, Warden U. S. Penitentiary, Ft. Leavenworth, Kansas.

Two of our six mold machines are used by the Green & Hunter Brick Co., Thurber, Texas, the finest plant in the United States—If our machine is good enough for Uncle Sam and such plants as the Green & Hunter Co., why is it not good enough for you? **For Price and Full Particulars Address**

Ross-Keller Brick Machine Company,

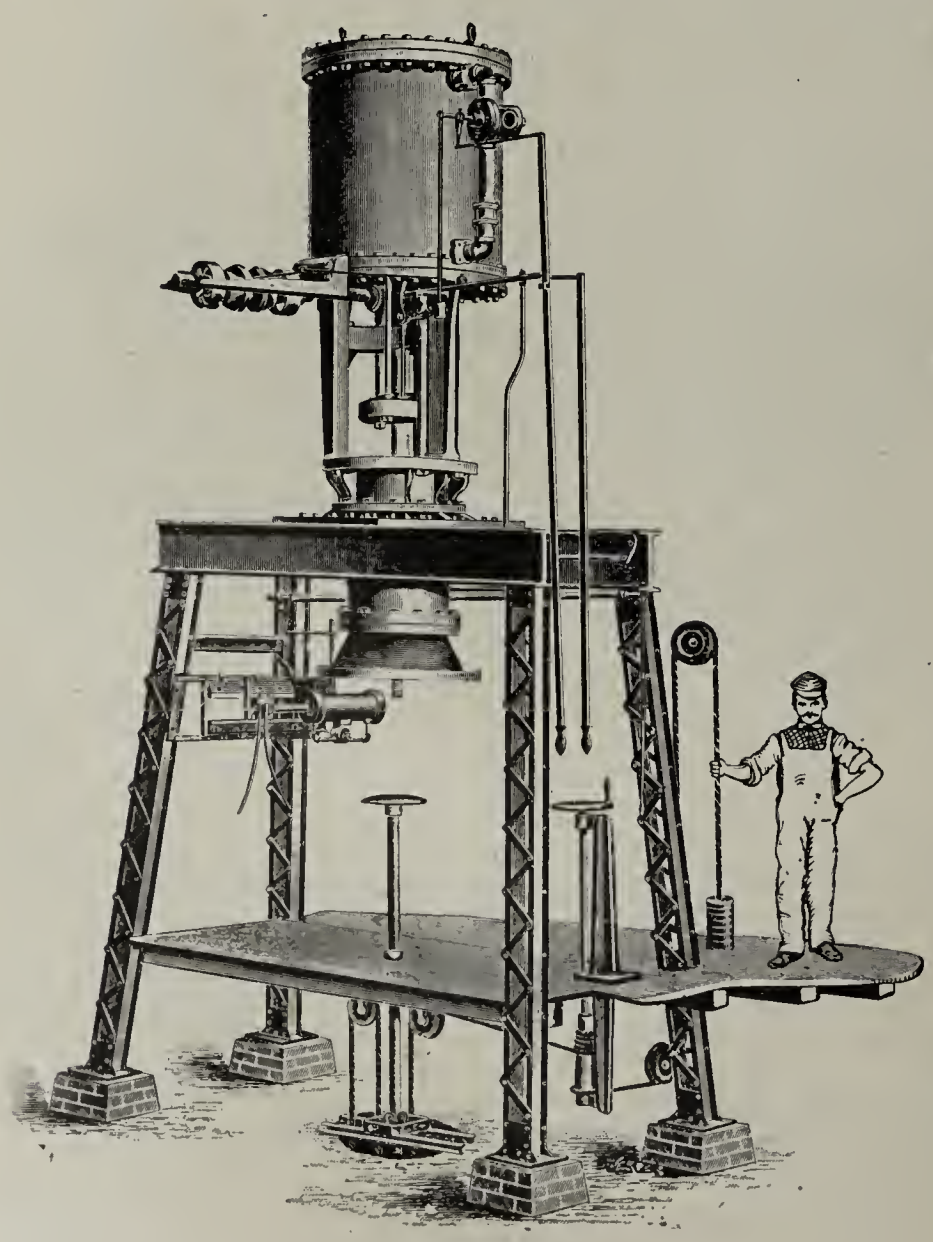
915 and 916 Holland Building, **ST. LOUIS, MO., U. S. A.**



When Buying New Machinery

Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front and Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.



Modern Clay Working Machinery.

We Furnish Complete Equipments for Sewer Pipe. Drain Tile and Fire Proofing Factories.
OUR DIES for Sewer Pipe, Drain Tile and Fire Proofing are Unequalled.

Steel Frame Dry and Wet Pans.

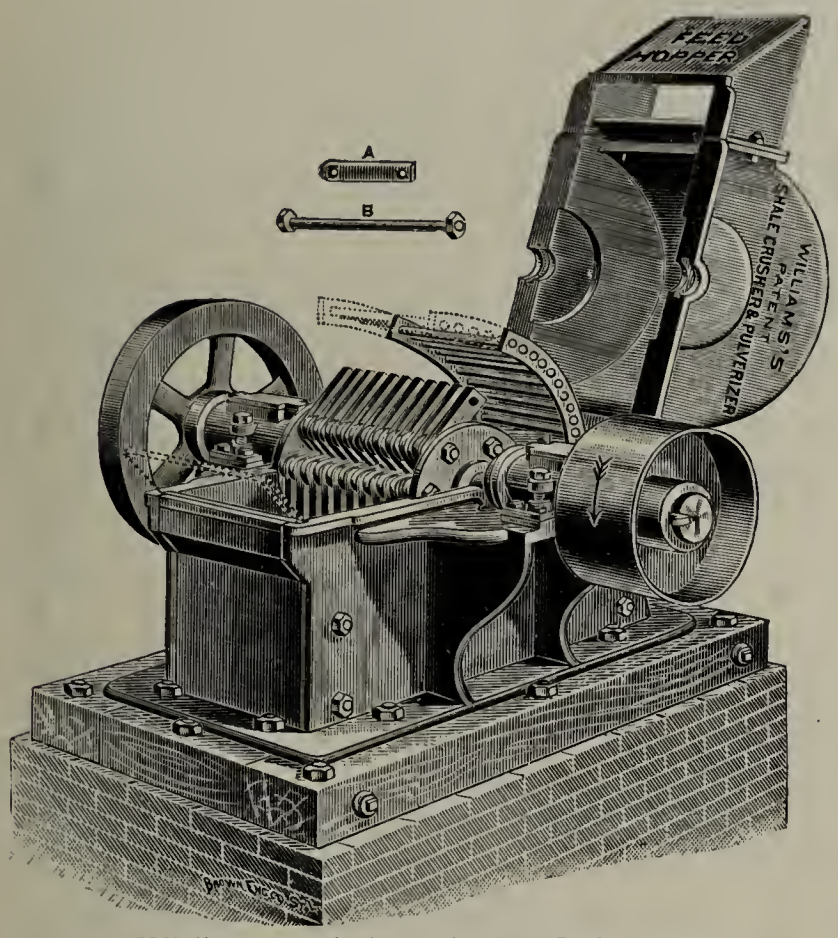
CATALOG ON APPLICATION.

TAPLIN, RICE & COMPANY,

Akron, Ohio.

The Williams Patent Crusher & Pulverizer Co.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

FOR FURTHER INFORMATION WRITE TO

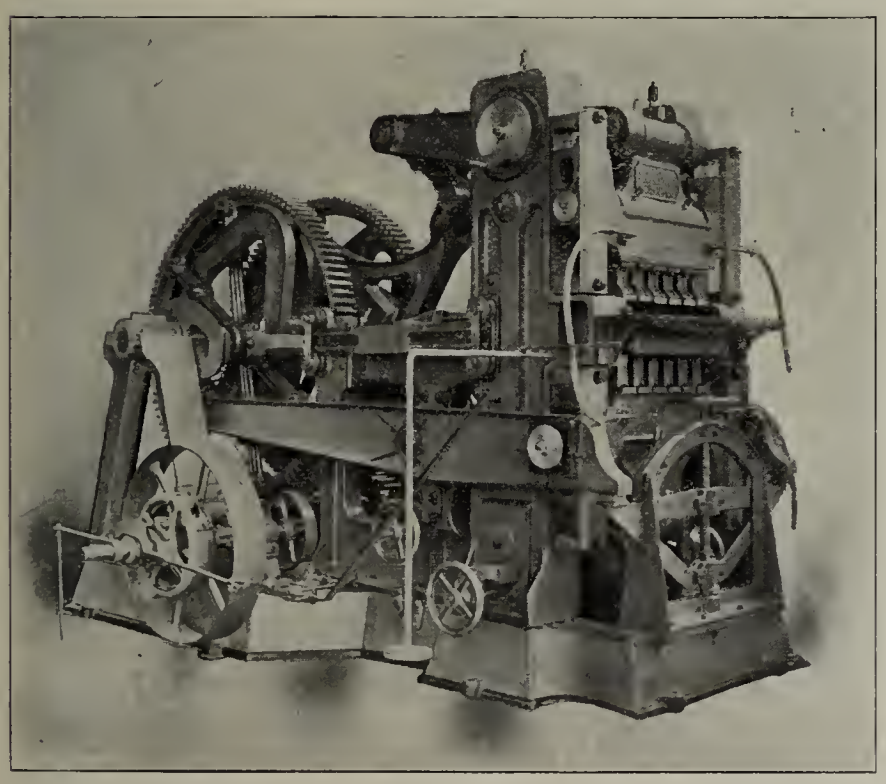
The Williams Patent Crusher and Pulverizer Company,

2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Washington Life Bldg.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for { STRENGTH, DURABILITY and SIMPLICITY.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market, requiring only 6 to 7 horse power to operate the largest 6-mold press. All parts subject to strain are made of the best bessemer steel, and can be seen and gotten at easily. The thickness of the brick can be changed and regulated without stopping the press, and every press is fitted with the Fernholtz mold Box, which is admitted to be the best in use. For fine pressed and ornamental brick, this machine cannot be equalled, the pressure on, and movement of the clay in the mold being such as to prevent granulation, and insures the most perfect product possible. We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer** in our own factory and guarantee them fully.

The opinion of those using our press and full information on application.

Dealers in BRICKYARD SUPPLIES.

The Fernholtz Brick Machinery Co.,

WESTERN UNION CODE USED:
CABLE ADDRESS "FERNBRICK."

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

The STANDARD BRICK DRIER,

May not be the ONLY good Drier on the market, but it is considerably better than the average good Drier.

For economy of Fuel and Labor, Range of Work and Capacity it is without a successful rival. It is easily regulated to meet the requirements of all kinds of clays, it is entirely free from complicated mechanical contrivances and requires no expert labor to operate it. It is SIMPLE, SAFE and SENSIBLE and it is NOT an experiment. It is SO good a Drier that you cannot afford to ignore it when it comes to the point of investing your money in a Drier.

OUR NEW CATALOG No. 50 Which we will be pleased to exchange for your Name and Address is full of information that will interest you. It tells concisely and plainly how THE STANDARD DRIER is constructed. how it operates, what it will dry, why it is economical and efficient, why it is the Drier that will most thoroughly satisfy you for all time and what its many users think of it. Write for a copy TO-DAY.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., FEBRUARY, 1900. No. 2

OFFICIAL REPORT.

Proceedings of the Fourteenth Annual Convention of the National Brick Manufacturers' Association of the U. S. of A.

IT WAS A splendid audience which greeted President W. D. Richardson when he called the fourteenth annual Convention of the N. B. M. A. to order Wednesday afternoon, Feb. 7, at 3 o'clock. Every feature of the meeting was most pleasing. The attendance was large and the accommodations provided most satisfactory. The convention hall of the Cadillac is a beautiful room, perfectly adapted to the needs of such a gathering. It is decorated in white and gold, and lighted with innumerable incandescent lights in the ceiling, the effect being far more restful to the eye than it is possible to obtain from a few lights of greater power. Comfortable chairs were provided for a little more than three hundred, and there were few, if any, vacant seats during the first session. In the rear of the room there was a row of settees, and these were occupied by the ladies, their costumes adding a bit of color to the picture, which was an inspiring one. Three hundred earnest yet cheerful faces are in themselves an inspiration, and, with such surroundings, it is little wonder that the speakers were at their best and that enthusiasm ran high.

W. D. RICHARDSON, Retiring President, Shawnee Ohio.

President Richardson: Gentlemen, the fourteenth annual Convention of our Association will be opened with prayer by the Rev. James Thoburn, of Detroit.

—The Opening Prayer.—

Rev. James M. Thoburn: Almighty God, our Heavenly Father, we thank thee for the life that now is, with all its blessings and privileges. We thank thee for the activities of life made possible in these days of opportunity. We thank thee for every assemblage of men where, by mutual sympathy and co-operation, they may better each other's lot, and we invoke thy blessings upon each assembled for the discussions of ways and means and methods for the good of our fellow-men and for our own good. We thank thee that it is best for us to seek thy blessing upon every lawful undertaking in life, and that whatever is right we may do with all our might and invoke thy approbation. And do thou be in the midst of the discussions here, and in all the plans that shall be made may the principles of the Lord God be conserved. May there be such ideals exemplified in business life as may exalt thy holy name. Wilt thou enable us to daily and hourly keep before us the thought that we belong to thee, and when this life's opportunities and its pleasures have ended with us, may we be received to thee in heaven with Jesus Christ our Lord. Amen.

President Richardson: The next is the enrollment of new members and the roll call. This is a mere form, and will be omitted, for the reason that our enrollment is not complete at this time, and it is not necessary to call the roll. The order of business will be announced by the Secretary.

Secretary Randall: It was the intention at this point to introduce Mayor Maybury, of Detroit, whose duty and pleasure it will be to welcome and turn the keys of the city over to the assembled guests. He has been called by other duties to a distant part of the city, and cannot be here for an hour, but he has requested us to hold a place for him later on. The next in order will be the President's annual address, by our worthy President, Mr. W. D. Richardson, Shawnee, O. (Applause.)

PRESIDENT'S ANNUAL ADDRESS.

Ladies and Gentlemen and Fellow-Brickmakers:

It is my pleasant duty to preside at the opening of this, the Fourteenth Annual Convention of the National Brick Manufacturers Association, and to address you for a few minutes in such manner as may be appropriate, and to call your attention to such matters as seem to me worthy of your consideration as pertaining to the welfare and efficiency of our organization.

First, I would congratulate you upon the felicitous conditions under which we assemble to-day. The large number of manufacturers that have come here from nearly every State in the Union

is indicative not only of the increased prosperity of our industries in the past year, but also of our good fortune in having been invited to hold our Convention in the beautiful and hospitable city of Detroit, to which we have been so cordially welcomed.

Brick are manufactured under such different conditions and for such a variety of uses that it is not to be expected that all who are engaged in this important industry have shared alike in the return of prosperity. But the fact that for a few years back there has been a general complaint at our conventions of hard times, while now so many are rejoicing at an improved state of affairs, should be a cause of congratulation to all of us. Fire brick manufacturers and paving brick manufacturers have undoubtedly been especially favored by the business conditions of the past year. The manufacturers of common building brick have also enjoyed a greater measure of prosperity than for several years, owing to an increased demand and to an organized effort to make selling prices bear a proper ratio to cost of manufacture.

The very conditions, however, which have been so much to the advantage of manufacturers generally have worked to the detriment of many of us who are engaged in the making of face brick. The large advance in price of all other building material, especially of structural steel, which it has been difficult to obtain even at a price 100 per cent. greater than in previous years; the increased cost of labor and the arbitrary action of labor unions; the large demand for money for the development of our country's industries, have all operated to check investment in the class of buildings that require face brick in their construction. The large and expensive office and mercantile buildings, apartment houses

W. D. Gates, President, Chicago, Ill.

and residences are built with idle capital, often when other investments are risky and when the cost of construction is low, so that the face brick manufacturer sometimes has a season of prosperity in a time of general depression, his business being one of the last to decline in time of panic, and one of the last to rise when the reaction to good times comes. Moreover, the face brick manufacturers make such a variety of product, and under such different conditions, and dispose of their ware in such distant markets, that any combination for higher prices or restricted output seems impracticable. The prices of face brick have been lower in the past year than ever before, notwithstanding the increased cost of labor and supplies. I speak of this more at length, not from a desire to make prominent the dark spots in this review of the year's work, but because I am naturally more interested in that branch of brickmaking, in which I am myself engaged, and of which I can speak more authoritatively.

Business this year must continue to be good, regardless of its being a presidential election year, which too many think must needs produce disturbing conditions and a lull in business activity. The election, to be sure, will cause a vigorous agitation of questions that are supposed to affect the prosperity of our people, individually and as a nation, and will excite a general endeavor to secure, by the triumph of a political party at the polls in November, such legislation as is believed to be for the greatest good to the greatest number—the true object of all legislation. No political party can rise to power in this country except by advocating measures that the bulk of its supporters honestly believe to be for the good of our people and the welfare of our country, and hence such party and its opinions are entitled to respectful consideration, even by those of opposite faith.

Every party platform should be framed not so as to catch votes by insincere or meaningless promise to special classes, but so as to represent as nearly as possible the views of the majority of said party, and it is the duty of every citizen to carefully and conscientiously study the issues laid down in these platforms, and to endeavor by legitimate methods to secure the triumph of those issues that seem to him most important to the welfare of the people—not for the glory of any party, but for the glory of our common country. He is an unworthy citizen of the Republic who uses unfair means to prevent an honest expression of the will of the people, or to obstruct the majority from putting into force by adequate legislation the views they have declared by their ballots. The chief concern in a government by the people should be to ascertain by a fair and honest election the will of the people, and to carry out that will. There is not, and there never has been, any serious danger to this country from an honest election, and there never will be such danger so long as the people can freely express their convictions in the selection of their legislative, judicial and executive officers. The insane belief that is fostered by politicians, sometimes no doubt with sincerity, that the triumph of a certain political party would bring disaster and ruin, does more damage to business every four years than legislation or lack of legislation has ever done in our whole history, and it should be the duty of every broad-minded citizen, of every member of this Association, to combat such belief, to show by precept and practice, by word and action, that no matter what questions may be at issue in the coming campaign, no matter what party may triumph at the polls in November, business must and will go on just the same. When business men believe that business is good and is going to be good, that confidence of itself insures its being good, and vice versa. Let us not be misled by politicians who have their own selfish ends to serve, who make their living out of election campaigns. Let us have faith in the people, faith in our form of government, faith in God. Vox populi, vox Dei.

The most remarkable commercial development of the past year has been the rapid and extensive formation of trusts—the combination of those engaged in the same line of business for the purpose of insuring a more profitable investment. This subject of trusts is being much discussed in newspapers and magazines and in public assemblies, and will doubtless become an important issue in coming political campaigns. At recent conventions of several national associations similar to our own trusts have furnished the subject for a large portion of the president's annual address, and as they are of interest to brickmakers also, it may be well for me to give some attention to them upon this occasion.

Just what constitutes a so-called trust, just where to draw the line between a legitimate partnership or corporation and an illegitimate trust, has never been clearly defined. Nor just how a man or company of men can legally or constitutionally be enjoined or prohibited from owning, or leasing and operating as many plants as he may have the means and capacity for, even if it includes all the plants in any special line of business in city, State of Nation, is question yet to be passed upon authoritatively. Moreover, what special cause or causes have operated during the past year to produce this phenomenal development of trusts is difficult to determine, though all such developments generally occur when the necessity for them arises, and the necessity in this case is undoubtedly competition. Too active and often unwise competition has ruined many a legitimate business, and instead of reducing the cost of production has increased it and deteriorated the quality of the product as well.

It has been interesting to note in our own Association the growth of the trust idea in one form or another. A few years ago the subject of any combination among brickmakers to maintain prices was tabooed and proscribed in our convention, but some of the men who have been most active in their opposition to such combinations have been practically forced into them by shrewd and merciless competition, and now no subject at our annual meetings is listened to with more interest than a discussion of the best means of forming and maintaining local organizations of brick manufacturers, that by some practical arrangement or understanding may secure to themselves a fair and just return for capital and labor invested.

The operation of all the plants in any line of business as a unity does not necessarily require an increase of the selling price to increase profits. On the contrary, by a decrease in cost of production through more economical management, a decrease in the expense of manufacture and of making sales and checking or preventing of loss from sales to dishonest or irresponsible customers, even the lowest prices can be maintained profitably. Hence, if trusts are the outcome of natural and inevitable causes, and are founded upon sound economical principles, they must stand, and legislation should be directed not to their extermination, but to the control of the evils which attend their improper organization and management.

The fight against trusts should be not against those of private business, but against those of a purely public nature, such as railroad, telegraphs, telephones and national banks, and locally against street railways, water works and lighting plants, upon which the prosperity of all business depends, as well as the health and happiness of the people.

This is too big a subject for treatment in such an address as this, even were it germane to the occasion. The trust that most affects brickmakers is the railroad trust, which is developing at an alarming rate, and threatens soon to place all important lines in one pool. Nothing would be feared from this if it were the aim by economical management and profitable rates to pay a fair dividend upon the actual cost of construction and equipment, but when, through the manner in which railroads have been manipulated, we learn that 200,000 miles of operating railroad in this country owe to-day enough money to reconstruct the entire system, we can understand something of the serious results that may follow from a railroad trust. That such a trust will be formed at no very distant day must be evident to anyone who has observed the steps taken in this direction in the past year. We know, moreover, something of what the railroad power has already done with impunity. We know the part it has taken in the selection of our legislators and judges, and even of the President. Garfield once declared that railroads rise above all law, and defy all judicial control, and that the time would come when the government would own the railroads or the railroads would own the government. And many years ago Senators Sherman, Conkling and Windom reported to the Senate that the railroad power could tax the products of the country to an extent that Congress dare not attempt.

By the action of the Central Freight Association the rates upon brick were advanced the 1st of January about 25 per cent., a greater increase than upon most other commodities, thus forcing many brickmakers out of their best markets, and unless relief can be obtained may result in the ruin of their business.

No one can reveiw the history of this Association, as recorded in the proceedings of its thirteenth annual Convention, without being proud of his membership in it. The value and influence of these thirteen conventions upon the advancement of the art of brickmaking cannot be overestimated. The most skillful, progressive and successful brickmakers in this country, and the leaders in technical knowledge of the clayworker's art, have come to these conventions and given freely from their experience and store of information. If the official reports of these conventions were collected into one volume, systematically arranged and indexed, it would form the most valuable book upon brickmaking in the English language. And yet we know that much of the value of these meetings does not appear in the reports, is not brought out in the convention hall, but between the sessions in the hotel lobbies, in the closer contact of member with member.

Moreover, the influence of the Association in the establishment and maintenance of the ceramic department of the Ohio State University and the support of a scholarship there for the carrying on of technical investigation, is beginning to be felt in improved practice, and is destined to be far reaching in its results. Young men who have been graduated from this institution are accomplishing more in a few years than others without their training have been able to accomplish in a lifetime.

The first annual report of the investigation carried on at this institution has been just issued by our Association, and is a record of careful, laborious experiments to ascertain important truths in regard to the questions investigated. Nothing like it has ever been done or attempted for our art in this country. The satisfaction of possessing some definite knowledge of these questions that have been discussed so much at our conventions and in our trade journals is worth many times the cost. This report and those which are to follow will form a most valuable contribution to ceramic literature, and will add renown to Prof. Orton and his clayworking school, as well as to the National Brick Manufacturers' Association of the United States of America. And yet we are not doing all that we might do in this direction. There is abundant room for still higher development in the work of our Association and in the conduct of our annual meetings. We will some day, I believe, broaden our name and expand our constitution so as to include all branches of clayworking, the manufacturers of all kinds of brick and building material from clay, as well as the manufacturers of pottery and porcelain—united for a common object and meeting in common convention, but dividing into sections for the discussion of questions more particularly pertaining to each. This movement of expansion has already begun, and we are dividing the time here this week with the American Ceramic Society, composed of men engaged in the higher forms of clayworking that require a scientific training and technical knowledge not often found among brickmakers. This society is an offshoot of our Association, having its inception at the Pittsburg Convention, and is destined to play an important part in the higher development of the clayware industries of the United States.

To carry on the investigation of technical problems and publish reports in a proper manner requires a larger revenue, and some special systematic effort should be made to interest in this work every clayworker in this country. Our Association at the last Convention wisely voted to increase the annual dues to $3, an amount small enough in proportion to the benefit conferred, the good accomplished, but large enough to meet all demands and to do more than we have yet attempted if a larger number of brickmakers and other clayworkers could be brought to see it to be their duty also to identify themselves with this good work, to join our Association and pay its annual dues, whether they attend its conventions or not. All who are engaged in the manufacture of clay products, from common brick to the finest porcelain and art pottery, should join in this work, in this illimitable field of study and research—the clays of America, their characteristics and uses and their manipulation for the production of the various wares of commerce. Some of us, to be sure, can contribute only a little to this knowledge, but we are interested beyond the bounds of our own product, and we are glad to go pay a little each year to meet the expenses of those who are qualified to go farther in these researches than we can, and who so generously give of their time and abilities. We derive much satisfaction from the knowledge that by our united efforts clayworking is becoming an applied science, that records are being made, a literature being formed, that will give coming generations a foundation upon which to build higher than it has been possible for us to do; that will before the close of another century place the manufacture of clay ware in the van of the industries of the world.

It is a pleasure to me, as I am sure it is to all of you, to see with us so many of the old members of this Association, some of whom were its founders in Cincinnati fourteen years ago, and have been its faithful and constant supporters ever since. It is,

C. A. SCHULTZ, Second Vice-President, Rondout, N. Y.

on the other hand, sad to miss from this number, as we do now at nearly every Convention, one or more of those whom we have come to love and respect for their noble qualities, and for their devotion to the objects of this organization.

The death of one of these old members is always a serious loss to our Association, for it is the older members upon whose loyalty we can always rely. They have our welfare so much at heart that they will not permit any element of discord to disturb the harmony and fellowship that has been such a remarkable feature of our meetings. Not that we expect all members to have the same views. On the contrary, we want all sides of every question presented in our discussions. We are a true democratic organization, believing that every member, however humble, however conservative or radical, should have an equal voice in the management of our affairs, but the minority having striven fairly and honestly for the adoption of their views, should abide cheerfully and gracefully by the will of the majority. The fault-finders the soreheads and kickers have been remarkably few in our Association. It is only that they have been able to make themselves unduly prominent to outsiders by reason of the opportunity so willingly given by a Chicago journal to publish their complaints. A quaint Yankee, as the result of his shrewd observance, said: "The whole world is divided into two sections—one stirs around and does things, and t'other stands by and just naturally wants to know why in thunder they don't do 'em different." I would commend this observance, together with that of an ex-president of our Association in a letter recently distributed to our members, to the publishers of this journal, who, while aiming to advance the interests of brickmakers, have for reasons too obvious to mention stood aside and willfully misrepresented the proceed-

ings of our meetings instead of joining us and contributing their money and influence to the work we are doing.

I am glad also to see so many new faces among us to-day, and such a large attendance at this first session. Gentlemen, I welcome you to membership in our Association, and hope you will all be present at every session of this Convention, and at many succeeding conventions. I am sure that you will find these meetings of great benefit to you in many ways, and that the more of them you attend the more you will want to attend.

Fellow-members, my duties as President will soon be over, though as a member of the executive committee I shall continue to take an active interest in the affairs of this Association. I take this opportunity to thank you again for the honor you have done me in selecting me for the high office and for the uniform courtesy and consideration shown me in the discharge of my duties as your presiding officer.

I want also to thus publicly thank the brick manufacturers of Columbus for naming me as their candidate for this office, and for presenting me with the elegant gold badge, which I am proud to wear, and which I will ever preserve and cherish as a memento of the highest honor of my career as a brickmaker.

And now, fellow-members of the National Brick Manufacturers' Association, let my last words to you as your president express the hope that this closing year of the nineteenth century may bring prosperity and happiness to all of you, and presage for the twentieth century an era of unprecedented progress and prosperity to the clayworkers' art, and greater knowledge and happiness to all mankind. (Applause.)

Secretary Randall: The next in order, gentlemen, is the

J. W. SIBLEY, Treasurer, Birmingham, Ala.

report of our Treasurer, Mr. J. W. Sibley, Birmingham, Ala.

TREASURER'S REPORT.

To the Officers and Members of the National Brick Manufacturers' Association:

Gentlemen—I hand you herewith a statement of receipts and disbursements, account of the thirteenth annual Convention.

It is some comfort to me to note that my reputation as a surplus evolver can be still sustained, though, as the report shows, the famous surplus is almost as evanescent as Governor Pingree's potato patches.

The expansion of the field of technical investigation has kept pace with the growth of the Association, and discloses the wisdom of our increasing the annual dues to $3, which will prevent the surplus from becoming an "irridescent dream."

It must be gratifying to you all to note the unprecedented increase in new members, there being nearly one hundred such, and the regaining of sixty-four old members, who had dropped out of the ranks last year, indicates that the craft realizes the many benefits that accrue from membership in this Association.

As yet our colonial members are slow coming in, but as Beveridges (beverages) from Indiana have been introduced into the Philippines, may we not expect to hear ere long that the "Brickmaker to the President" has established a branch factory over there, where plenty of soft mud prevails during the wet season, and no stamps are required to distinguish the "Pikes."

Respectfully submitted, JOHN W. SIBLEY, Treasurer.

Receipts and Disbursements, Account of the Thirteenth Annual Convention of the National Brick Manufacturers' Association.

—Receipts.—

Balance in treasury, account 1898		$123.78
Membership fees, 91, at $5	$455.00	
Membership fees, 264, at $2	528.00	
Sales Paving Brick Committee's Report	4.30	
Total receipts		987.30
		$1,110.00

—Disbursements.—

Paid railroad agent, per voucher	$17.00	
Paid scholarship Ohio University, per voucher	250.00	
Paid for programmes, mailing, etc., per voucher	35.90	
Paid for 1,000 copies Annual Report, per voucher	159.75	
Paid for 1,000 copies Report of Committee on Technical Investigation, per voucher	221.45	
Paid for stationery, postage, etc., per voucher	88.60	
Paid Secretary, traveling expenses, etc., per voucher	250.00	
Paid Assistant Secretary, per voucher	50.00	
Total expenditures		1,072.70
Balance in treasury (surplus)		$37.78

President Richardson: You have heard the report of the Treasurer. What is the pleasure of the Convention?

Mr. Charles A. Bloomfield: I move the report be approved and accepted.

This motion was seconded by Mr. E. M. Pike and carried.

—The Election of Officers.—

President Richardson: The next is election of officers. As we have with us many who are new to the work, I will read a section of our Constitution regarding election of officers: "The officers of this Association shall consist of a President, three Vice Presidents, Secretary and Treasurer, who shall be elected by ballot at each regular meeting, provided that no person shall be eligible to the presidency who has not attended one previous Convention." The first in order will be the nominations for President.

Mr. George Clippert, Detroit, Mich.: Mr. President, Ladies and Gentlemen of the Convention, I believe it has generally been the custom to select the President from the city where the Convention was held. As we of Detroit have no candidate, I wish to name a neighbor of mine, who lives out West in a little town—I think they call it the Windy City. I do not think he wants to be the President of this Association, because he is rather a bashful and modest gentleman, but his very name makes me believe he is well fitted for the position. It is something that opens and closes, and that is, I think, one of the duties of the President. I therefore take great pleasure in presenting to you the name of William D. Gates, of Chicago, for President. (Prolonged applause.)

Mr. F. H. Wolf, Detroit: As a brickmaker from Detroit, I indorse and second the nomination of Mr. Gates for President of this Association. (Applause.)

Mr. Morse, New Britain, Conn.: I move the nominations be closed, and the Secretary be authorized to cast the unanimous ballot of this Convention for Mr. Gates.

This motion was seconded by several members and carried.

President Richardson: Mr. Gates is duly elected, and the next in order is the nominations for First Vice President.

J. C. Adams, Indianapolis: I would place in nomination for the position of First Vice President of this Association a gentleman who is fully identified with the brickmaking interests of Detroit, and, as well, being an important factor in the industrial and business interests of this great metropolis of the Central West. I nominate Mr. George H. Clippert. (Applause.)

W. G. Titcomb, Providence: I take pleasure in seconding the nomination of Mr. Clippert.

Mr. Anthony Ittner: I move that the nomiations be closed, and that the Secretary be authorized to cast the ballot of this Convention for Mr. George Clippert for First Vice President.

Motion seconded by Mr. F. E. Eggers and carried.

President Richardson: Mr. Clippert is elected, and nominations are in order for Second Vice President.

Mr. Edwin Brockway, Fishkill-on-Hudson, N. Y.: I have in mind a gentleman I would like to name for Second Vice President of this Association. He lives on the Hudson river, and his name is Charles Schultz, of Rondout, N. Y.

Mr. McDermot: As Mr. Schultz is such a modest man, a great many of the members do not know who he is, and I want to call their attention to him. He is sitting over here. I second the nomination.

It was moved and seconded that nominations be closed, and the Secretary cast the ballot in the usual form, which motion carried, and Secretary Randall cast the ballot.

President Richardson: Mr. Schultz is now elected, and nominations are in order for Third Vice President.

Mr. D. V. Purington, Chicago: I want to name a man representing a different section of the country. He is not here to-day, but he has been a member for many years, and I nominate Xavier Wittmer, of Pittsburg, for Third Vice President.

Mr. Grant Dibert, Pittsburg: It gives me great pleasure to second the nomination of Mr. Wittmer.

E. M. Pike: I move that nominations be closed, and that the Secretary cast the ballot as before.

Seconded by Mr. Carson and carried.

President Richardson: This completes the list of Vice Presidents, and the next in order is nominations for Secretary.

C. A. Bloomfield: I would like to offer to this Association the name of a charter member of this Association, and one who for years has devoted his untiring time and attention to making this Association the great success that it is. At all times, from one end of the year to the other, he is called upon, and is never backward in giving his time and his best endeavors to any member who may be looking for information. It is to his efforts and to his enthusiasm and to his energy that this Association has reached the great success it has. I present the name of Theodore A. Randall, of Indianapolis, as Secretary for the ensuing year. (Loud applause.)

F. E. Eggers: I second the nomination of Mr. Randall, and I add just one thing, and that is that Mr. Randall never misrepresents anything. He always represents things fairly, and I think that the Convention should re-elect him.

Mr. Wm. Conway: I move that the nominations be closed, and that the Treasurer be instructed to cast the ballot of the Convention for Mr. Randall for Secretary.

Mr. Ittner seconded this motion, which was duly carried.

Treasurer Sibley: The vote has been cast.

President Richardson: I declare Mr. Randall duly elected. The next is nominations for Treasurer.

W. A. Eudaly: I nominate Mr. John W. Sibley, of Birmingham, Ala.

Mr. A. Ittner: It affords me special pleasure to second this nomination, and move that nominations be closed, and that Mr. Sibley be declared the unanimous choice of this Convention for Treasurer for the ensuing year. I think that the members of this Association are under lasting obligations to Mr. Sibley for the nice fun he always gets into his reports each year.

A Member: Funds or fun? (Laughter.)

Mr. Ittner: Both. He gets in funds enough to meet all bills, and he makes fun enough in his report to make us all merry, and it is for that reason I take pleasure in seconding the nomination of Mr. Sibley.

Motion seconded by Mr. B. W. Blair and carried.

President Richardson: Mr. Sibley is duly elected, and there is but one more officer to elect, and that is we must elect a member to take the place of the retiring member of the Committee of Technical Investigation. This committee now consists of D. V. Purington, Anthony Ittner, Charles A. Bloomfield and W. D. Richardson.

C. McDermot: We all know that this committee cannot be improved upon, and I therefore move that the retiring member be re-elected for a term of four years.

This motion was seconded by several and duly carried, so that the committee stands as before.

President Richardson: We are pleased to have the mayor of Detroit with us to welcome us to this city, and I have the pleasure of introducing Mayor Maybury, of Detroit. (Loud applause.)

—Mayor Maybury's Welcome Address.—

Mayor Maybury: Mr. President, Ladies and Gentlemen, it is a source of very great regret to me that I was obliged to be absent at the opening of your session, but the cause, I believe, has been explained to you. I was attending the funeral of a very dear friend. It affords me great pleasure to welcome you to Detroit. I have had imposed upon me in the last two days the pleasant duty of welcoming three conventions. The first was the State Dairymen, and I was wondering if it were possible for me to set up for you, in the matter of brickmaking, as high an ideal as I did for those gentlemen. I told them that the ideal cow in this country was in Vermont, and, if they could produce that product here in Michigan, it would be a great thing. As they seemed in doubt I told them about that cow. It happened on a certain occasion they were conducting a very ardent temperance campaign. One of the most earnest supporters of the cause was a gentleman by the name of Luke Poland, a fine old gentleman of the old school, and who dressed as they did in the old colonial days up to his latest days. I had the pleasure of his acquaintance, and found him a very delightful charac-

T. A. Randall, Secretary, Indianapolis, Ind

ter. The old gentleman, as the years grew upon him, was very fond of something to warm his milk, to discolor it a little bit, but altogether it became to him a very delightful addition to the natural product. It was not known to a great many, except those who knew how he lived in his home and who knew how he needed a little such milk in the morning and several times during the day. On one occasion he was speaking in the open air, and his friends knew he would need some little stimulant. The committee had carefully prepared a glass pitcher of milk, and had added to it four or five ounces of good brandy. Well, the old gentleman had got pretty well along in his speech on total abstinence when he reached over, entirely unconscious of the foreign matter in the pitcher, and drank what was supposed to be pure milk. He filled the glass again, the crowd applauding, and drank another glass. "Friends and neighbors," he said, as he put down the glass, "Heavens, what a cow!" (Laughter.) Now, if there is a brick manufactured for which I can put up such a high ideal for you I do not know of it, but, if there is, I would ask you to tell our Michigan men about it, and see if they cannot attain the same prominence for brick as Vermont has for her cows. I have never been able to understand how certain expressions got into our language in regard to bricks. I do not know, and never could understand, why a brick should be located in a hat. If a man is going along with

an uncertain step they are apt to say he has a brick in his hat. We all know, not from experience, but from observation, that he has no brick in his hat. I want to say that it is not a brick, but something else under his hat that is making the trouble. (Laughter.) Then we hear a man referred to in a very complimentary manner as "a brick." It has got into the literature of the times, and means a great deal. It seems to describe a man in just a sentence—yes, in a word.

You honor us very greatly by your presence, and especially by the presence of your ladies. We always think it is an added courtesy when our visitors bring their ladies. I want to say they are welcome, too, and you are doubly welcome because of them. I might add here I am a bachelor. (Laughter and applause.) I like to be honest about these things. There may be among the ladies who have come here one who might be induced to remain. (Laughter and applause.)

A Member: Mayor, you are a brick.

We all know that in ancient times brick was the prevailing article of which important and lasting structures were built. We know that to-day in England there are brick that are known to have lasted ten centuries, and are as good as when first laid in the wall. So it would seem that as God created those whom he has made in his image out of the dust, so he seems to have chosen the same material to be the most perfect model and the most lasting element in world building. Now, brick are put to many uses. Perhaps the oldest is that in the public ways. It is said that the great Appian way, over which the armies of Caesar marched to conquest, was made out of the dust of brick. Indeed, I hazard the prediction that brickmaking as an art is coming back to the place it once occupied. I know there are many lost arts, and it may be that at some time, at some place, the knowledge of the process of manufacturing, the best way of handling them, was well known, and that it is now coming back to benefit the world again. I do not think that brick were made of so many different qualities and in such great quantities as now. I think a great many things that we are now bringing to perfection were well known in the days of arts that are lost. Take, for instance, the bath. We read in the early days that the Hebrew and Egyptian were taught to take baths as a part of their religious training. It was their duty to bathe once, twice or three times a day, and we read of these baths as being luxurious. We say, how is it possible? They knew nothing of the way in which rooms are now lighted and warmed. These ancient baths were taken under no less convenient and comfortable surroundings than we have to-day. The methods were not the same, but the results must have been the same. The explorer in the ruins of Pompeii finds the hollow shaft surrounding the bathing chambers. Here heat and water were supplied in abundance, and all the luxury of this day duplicated. I want to say that never again will these arts be lost, and I will tell you why. You could not have got the brickmakers of this country, or any other country, together one hundred years ago. If a man had a secret of making brick any better than his brothers he would not go before them and discuss it; he would hug that secret to his own breast. So, with the physician, if he knew how to cure hydrophobia he would have said, "Come to me if you want to be cured," and when he passed away the secret would have passed with him. Had a man like Edson lived one hundred years ago, would he have given us all the wonderful things that Edson produced? Each inventor guarded his secrets selfishly, and when he died his secrets died with him. So I believe in the history of brickmaking. There are secrets about it yet to be discovered. While you have brick in greater quantities and greater qualities, there is something about its use that you have not discovered. You are here for the purpose of seeing what is best for all, knowing what is best for all is best for you. As time goes on the world is growing better, less selfish, as your assembling proves. So I thank you, my dear friends, for coming here, for we will all be made better by your coming.

E. S. Morse, New Britain, Conn.

I will not discuss the question of brick, for you all understand better than I do what brick is best both for building and paving purposes, but I may be permitted to say that here in Detroit we have some splendid brick paved streets. We are going to give paving brick a fair test, and we have many miles of brick pavements that we are watching very closely, for we want the best paving, and are willing to pay for it. (Applause.) You have come to a city that is at once young and old. That sounds like an anachronism.

This city, in 1901, on the 24th of July, will complete 200 years of existence. We have passed through three periods or dispensations. The early settler, with his language, has left us and gone to his rest, leaving here his memory. The early French explorer inhabited the city of Detroit. He was a gentleman par excellence, and his life has had a social effect on the life of Detroit that 200 years has not dimmed. The early settler's language is gone, the old inhabitants themselves and generations of them are gone, but they are not forgotten. I want to say to you that we look back upon them with feelings of reverence in view of the examples of kindly graces and courtesies which they left us. They landed on the night of the 24th of July, 1701, on a spot less than half a mile from where you assemble. They had cruised up and down the river trying to pick out a site for a city. They were a motley crowd. Fifty were Indians, fifty settlers, and fifty French couriers de bois, and two Christian missionaries. As the sun went down and the birds of the air folded their wings and went to rest this pilgrim party landed, and the sounds of their evening vespers rose on the air. We believe the benedictions that fell upon the pious pilgrims are still with us to-day, for we have never known the curse of famine, disease or flood. Fifty years afterward, under the treaty of Trent, this whole country passed over to English dominion. The French and Indians lived together in peace. They fished and hunted, but the coming of the English brought about a different state of things, and the forests and streams around here were dyed with blood. In 1813 there passed away the second flag under which we had lived. We lived once under the French flag, then for fifty years under the cross of King George, and now for nearly one hundred years, and we expect forever hereafter, to live under the stars and stripes.

I wish the season was more pleasant, less inclement, that you might go out and see something of this goodly city. We have here a city where the people own their own homes more in proportion than that of any city of its size in the world. As you pass over the avenues where stand palatial homes you will see on the side streets rows of little cottages, and will note evidences that they are not rented homes. You will see the kindly hand of the housewife in the flowers that grow in the garden and climb over window and door. The pride of our city is not alone its palaces, but these rows of cottages, where peace, plenty and happiness dwell. I wish it were possible for you to take the trip that we are anxious for all of our visitors to make—less than six minutes' ride by car—to Belle Isle, a park of 700 acres. It will give you a splendid opportunity of viewing the shipping facilities of our great river. You can drive six miles over splendid roads along the river's bank all the way. We have improved a portion of the island, but the large and better part remains as God gave it to us. The roads in that part of it are simply made that you may pass through, and that the children may pass through and gather the flowers and play in the shade of the trees. You can well imagine in large cities, where the children go for months without getting a glimpse of field and forest, how much of a privilege they enjoy. You can there witness scenes that tell you that it is a perfect public park for the tired mother to take her child to and find perfect peace and rest from her wearying labors. In the evening you will see the father with his dinner pail and basket going out on the ferry or cars and taking his supper with his family in the open air, and coming back home refreshed in the cool of the summer evening. It is truly a park for the people. I wish it were possible, even in the desolation of winter, for you to see it. Possibly to-morrow some of you may act on my suggestion and take the time to go out there. Let me say there has never been a drop of blood shed there. When Tecumseh became angered because of the perfidy of his white brother, and the ground all round was red with blood, they held this

spot sacred. The Indians seemed to feel, as I say, that it was a sacred place, and consequently no blood was shed there.

Gentlemen, let me say to you again that I bid you each and all a hearty welcome. Our streets are somewhat peculiarly laid out. (Laughter.) The Cadillac is situated on a sort of a public square, approached from all directions, and at times from none. Sometimes strangers have difficulty in getting around. Now, there are gentlemen here in the city, dressed in blue suits, with clubs in their hands—not that they expect to use them—and if any strangers have difficulty in getting back to their places of abode, or if you individually have such difficulty, just say to them that you are attending the Brickmakers' Convention and have the Mayor's permission to go where you please. (Prolonged applause.)

At the close of the Mayor's speech Mr. Eudaly proposed "three cheers for the greatest brick of Detroit," which were given with a will.

—The Installation of Officers.—

President Richardson: It has been a great pleasure for all of us to listen to Mayor Maybury, he has spoken so heartily, and it adds to the pleasure of my last duties as President of this Association to thank him for his kindly words of welcome. It was with some pleasure, of course, that I was installed into this office, but I assure you that it is with considerable pleasure and relief that I am now to take part in this duty of installation of the newly elected officers of the Convention. It is also a special pleasure to know that the gentleman who is to succeed me is one who is held in such high regard by the members of the Association and the clay-workers of America. It does honor to me and to all of us to have such a man hold this position. I would now ask our newly elected President, Mr. W. D. Gates, of Chicago, come to the platform. (Loud applause.) The Secretary has just reminded me that I am to introduce the gentleman, and I have the honor of presenting to you your new President. (Applause.)

President Gates: Gentlemen, I can't tell yet how you did it. I came to this city Monday morning. Prior to coming here I had received from the Secretary of the Ceramic Association—I had better explain, first, that in that society we elect our officers by sealed ballots, which are sent to the Secretary prior to the meeting and not opened until the meeting is held. In sending out the ballots, the Secretary inclosed a statement asking us to state anything we wanted to bring before the Convention. I thought it over a little bit, and I remembered that tale of the parrot that talked too much, and I wrote on the paper and said that I would not have anything to say, and carefully inclosed it in the sealed envelope with my ballot and sent it to the Secretary. When we arrived here I was put on the committee to open the ballots, and I discovered that Professor Orton had not seen my memoranda, and so I went into the Convention and talked until I think they adjourned to get rid of me. This afternoon I concluded to come in here and have a good, quiet time listening—I knew it would not do for me to talk here. So I came up here on the front row, with a few kindred spirits who realized that they must stop talking. Across on the other side was another row—a sort of living tableau. I joined the forces on this side, and glared over at Purington and his row on the other side. And then Jesse Adams came in, and I felt everything was all right; I was complacent and serene and peaceful until that bomb hit me. I need not tell you, gentlemen, that had I had the slightest idea of anything of this kind I would not have taken so prominent a position, and I want to tell you I came nearer to nervous prostration than ever I did in my life. In fact, I hoped the words of the Mayor would bring me to. It has been one of the proudest experiences of my life that I have had a membership in this Association. Many of the pleasantest friendships that I have to-day have grown out of my meeting with you gentlemen year after year, and I have been proud enough to be a member, and to meet with you, and look forward from year to year to the next meeting as I look forward to nothing else. It had been the height of my ambition to continue my membership, but it is the proudest moment of my life to be your President, and I will perform my duties as best I may, hoping for your kindly help and encouragement. (Applause.)

Secretary Randall: In order to relieve the badly embarrassed newly elected President, I will announce for him that the next in order is the installation of our First Vice President, Mr. George Clippert.

Mr. George Clippert: I fired that bomb. (Laughter.) I thought I had done my duty, Mr. President, when I nominated Mr. Gates from Chicago, and it was a surprise to have my friends jump up and put me into it. I thank you kindly for the high honor you have conferred upon me, and I appreciate it very much. The only thing I have to say is that I hope our President will never take sick or be absent, so that I will have to preside. (Applause.)

Secretary Randall: The next in order is the installation of our Second Vice President, Mr. C. A. Schultz.

Mr. C. A. Schultz: Gentlemen, I thank you kindly for the honor you have given me, and you might just as well go right on with the business. (Laughter.)

Secretary Randall: The Third Vice President is not here. It is a source of regret with all of us. He will make a good officer, for he has the welfare of the Association at heart. It is now in order to inaugurate our Treasurer, Mr. John W. Sibley.

Mr. John W. Sibley: My friend, the Secretary, is stealing a march on me. I will not detain you by attempting to make a speech. Only yesterday I traveled through the State of Kentucky, and, naturally, I lapsed into a very quiet and retiring mood, and I cannot say that I have altogether recovered from it. On the contrary, it seems to have increased my innate bashfulness and modesty. I thank you for this additional mark of esteem and confidence, and if Uncle Sam's treasury remains intact I will see that you have a surplus. (Applause.)

President Gates: It affords me pleasure to introduce to you your new Secretary. (Applause.)

Secretary Randall: Mr. President and gentlemen of the Convention, even after passing through Kentucky, Treasurer Sibley is no more retiring than I am myself. The "fire" that one passes through in Kentucky is not in it with the "fire" I have undergone for the past month. I have been "jollied" on all sides. My friends have given me to understand that after the election of officers here to-day I would be the most

GRANT DIBERT, Pittsburg, Pa.

"retired" officer of the lot. So supposing, of course, I was to lose my head and my job, I have not prepared any speech. You will forgive me this time, I know. I want to thank my good friends for their very kindly expressions of faith in the uprightness of the Secretary. I will try to deserve them. I also thank all the other members for their cordial support, and want to express the hope that you will charitably overlook any seeming shortcomings. It is my constant aim and purpose to advance your interests in any and every proper way possible, and I assure you that I will continue to serve you to the very best of my ability. Again I thank you. (Applause.)

President Gates: Necessarily the appointment of committees will be deferred until a little later. The Secretary will announce the next order of business.

Secretary Randall: The next in order is the first formal paper on the programme, an address by Grant Dibert, of Pittsburg, Pa., on "Progress and Prosperity."

PROGRESS AND PROSPERITY.

By Grant Dibert.

Mr. President and Gentlemen of the Convention:

"Progress and Prosperity" is a subject befitting the first place on the programme of the fourteenth annual Convention of the National Brick Manufacturers, held in this beautiful and prosperous city of Detroit.

The year just passed, for the greater number of the members of this Association, has been a busy one, and the balance can be found on the right side of the ledger, and, in a majority of cases,

a substantial margin. Coming as I do from Pittsburg, the manufacturing center, the tonnage not equaled by any city of the world, where iron and steel are worked from the most minute articles of commerce to the great beams, girders and the massive plates of many tons for the completion of our navy, and to-day, if other nations wish to equal our floating forts, they must come to the city of steel to purchase armament for their battle ships. In fact, our nation has become the credit one of the world, and taken the lead and become a busy hive of industry. Our vast and fertile fields have brought a harvest to feed our millions, and left many fold to be exported to the old world, bringing in return their bullion to pay for the same.

Why should we, in this enlightened age, listen to the pessimists, who are always reminding us that all that is worth striving for has been grasped by a few whom they term monopolists, and that our efforts will be in vain? My good friends, not in this land of the free and the brave, where every one is equal and the poor have the same protection as the rich. Why, this grand country of ours is likened unto a child—it has just begun to take on muscle, has simply started to be developed. We have centuries of prosperity before us. We will be as old as the youngest nation abroad is now, and success lies all about. We only need patience and energy upon our part to grasp it.

The year 1899 has been the banner one, and what a price the market has had to stand on account of success! But stop. Think one sober thought. What a fall this inflation of prices must have before it reaches a conservative basis.

The most pleasing thing I can say to you, fellow-members, is that of all the different manufacturers, you, the clayworker, who makes the best of the earth into wares for the comfort and enjoyment of mankind, you have been the conservative man, and

B. W. Blair, Cincinnati, Ohio.

your prices have been placed on a legitimate and reasonable basis of profit, even if the demand has been as great in proportion to the other lines, and we can congratulate ourselves that the profit, though not great, has been satisfactory, and the prospects for the year just opened are good. With the many contracts in progress, draughtmen's and architects' boards covered with plans, the work to begin at once, and a great proportion to be finished before the end of the season, the clayworker has a wonderful year before him. With the people awakened from the old idea that a few dollars saved in the first cost is money thrown away in the construction of cheap and inflammable buildings they have turned to the use of the durable and fireproof clay products, which to-day are made in every shape and shade, with the most beautiful designs in terra cotta, pleasing to the most fastidious taste, and it is gratifying to know that in less busy seasons we have improved and increased the capactiy of our plants to such an extent that we can take care of the increased demand, and supply the trade with ease. But I wish to warn you against too great profit, for too big dividends invite outside capital to invest in the clay industries, which, nine times out of ten, is a very poor investment for those who do not know the crafty nature of clay, and it takes time for these individuals with more money than a few other necessary articles to decide that it takes something besides dollars to make a success in our line of business, but, while he lasts, it costs the brickmaker money. Also, remember that too high a price curtails building and all kinds of improvements, which is a great feature, as we must have a demand. Do not forget your duty to the buyer in these prosperous times—that you should live up to your contract, and give just what you have guaranteed, and remember that one inferior article sold does more harm than a dozen good ones can rectify. This should be good food to digest for many not actual clayworkers who are valuable members of our Association. So do not let the prosperous times be our ruin, and keep to the thought that if we wish positively to be happy we should not do all the money making in our times, and have our children miserable in hunting the easy way to spend what we leave them. (Applause.)

—Cincinnati Wants the Next Convention.—

B. W. Blair, Cincinnati, O.: Mr. President, if I be in order, I have a matter I desire to bring forward at this time. When the citizens of Cincinnati found that I was to attend the Fourteenth Annual Convention of the National Brick Manufacturers' Association, they intrusted me with a most cordial invitation to meet next year in our city, when they will extend the hospitality of the Queen City to you. I have here an invitation from the Cincinnati League, embracing all the commercial bodies of the city, and also one from our brothers of the brickmaking craft, and I will read their invitation and submit it to you for the kindly consideration of the Convention.

Cincinnati, Feb. 5, 1900.

To the Officers and Members of the National Brick Manufacturers' Association, in Convention Assembled, at Detroit, Mich.:

Gentlemen—The undersigned have pleasure in presenting to your Association, on behalf of the commercial organizations of Cincinnati, a cordial invitation to hold your next meeting in this city.

The central location of this city, its ready accessibility to all the great lines of railway, render it the logical convention city of America.

The hospitality of our citizens, the beauty of our suburbs, and the many points of meritorious interest to visitors in the city proper, add emphasis to our invitation, to which, it is earnestly hoped, a favorable response may be secured.

This invitation is presented on behalf of the Cincinnati League, which, in such matters, represents the Chamber of Commerce, Manufacturers' Club, Cincinnati Board of Trade and Bureau of Transportation, Merchants' and Manufacturers' Association, and other kindred commercial organizations.

A letter from the mayor indorsing this invitation is also submitted. Yours respectfully, WM. B. MELISH, President.

E. P. WILSON, Secretary and Manager.

Cincinnati, O., Feb. 5, 1900.

To the Officers and Members of the National Brick Manufacturers' Association, in Convention Assembled, at Detroit, Mich.:

Gentlemen—Whereas, the Cincinnati League, which represents fully the commercial and social interests of the city, has tendered to your Association an invitation to come to Cincinnati in 1901, I have the pleasure, upon the part of the municipal authorities, in confirming the invitation and assuring you that should it be accepted every effort will be put forth to render the sojourn of your membership in the city most agreeable. Very cordially,

GUSTAV TAFEL, Mayor of Cincinnati.

Cincinnati, O., Feb. 5, 1900.

To the National Brick Manufacturers' Association of the United States of America, W. D. Richardson, President, and T. A. Randall, Secretary:

Gentlemen—The undersigned brick manufacturers, builders and citizens cordially extend to your Association an invitation to hold your next convention of 1901 at Cincinnati, O.

The National Brick Manufacturers' Association was organized at Cincinnati in the year 1886. We have noted with pleasure its growth each year, and the vast influence it has exerted and the good it has accomplished in the fourteen years of its existence—this not only in the manner above recited, but in the educational and technical information it has imparted to its members and the craft in general.

It is proper that on its fifteenth year it should again revisit its birthplace, and let us and our citizens see it in the full vigor of its manhood, and for its members to see the progress our lovely city has made in those years, and also for us to be able to dispense a parent's hospitality. Cincinnati, in addition to being the father of the Association, possesses many advantages for your meeting. Here is the Rookwood Pottery, its products one of the fine arts of the clayworker's handiwork, and our city a central point, easy of access from the South, North, East and West.

The Cincinnati League and our citizens generally earnestly join in this invitation, and congratulate you upon the success of your organization and its meetings. Yours respectfully,

THE J. M. BLAIR BRICK CO., Brick Manufacturers.
THE CINCINNATI BRICK CO., Brick Manufacturers.
THE BUSSE-HUDECKER BRICK CO., per B. H. Busse.
GEORGE H. BRUNS, Brick Manufacturer.
MITCHELL BRICK CO., Brick Manufacturers.
A. MEIER & CO., Brick Manufacturers.
J. F. GOULD, Brick Manufacturer.
H. SISER & BRO., Brick Manufacturers.
SCHUMANN, BLOSS & CO., Builders.
WILEY & AVEY, Contracting Bricklayers.
W. J. PUGH, Contracting Plasterer.
THE ROCKCASTLE STONE CO., per Ross Hamilton, Secretary and Treasurer.
ROBERT BLAIR, Contracting Plasterer.
LOUIS GOLDKAMP, Builder.
CHAS. W. IRELAND, President Builders' Exchange.
THE BATAVIA CHALLENGE BRICK CO., per B. T. Hazen.

President Gates: This invitation will go to the executive committee. It is very pleasant to have Mr. Blair return to us

with this friendly invitation. It has always been a wonder to me that any of us got away from Cincinnati at our meeting there fourteen years ago. They treated us so nicely that I have always wondered that we did not stay with them.

Secretary Randall: Before taking up the discussion of Mr. Dibert's paper, and before any of the members leave the room, I will announce that the annual festivities occur this evening at the hour of 9:30, here in the hotel. The local committee have made arrangements for all, and they expect all visiting brickmakers and those accompanying them to join in this function. The visiting ladies and those accompanying them will be taken to the theater. They are requested to assemble in the parlor at 7:30 for that purpose, and it is hoped that they will enjoy themselves so much that they will be perfectly willing to retire immediately upon their return to the hotel. (Laughter and applause.) The next in order is the discussion of Mr. Dibert's paper.

—Progress and Prosperity—General Discussion.—

President Gates: In opening this discussion, which I hope will be entered into generally, I will call upon Mr. George M. Fiske, of Boston.

Mr. George M. Fiske: This is certainly unexpected. I will try to open this discussion short and quick, the same as we open oysters down in Boston. I am interested in this paper. The subject itself is certainly interesting to us just now—"Progress and Prosperity." I have been struck with the atmosphere of this Convention. I did not arrive by an early train, and did not have the pleasure of meeting very many of the members before this session, but I have been contrasting it with that of two years ago at Pittsburg. (I did not have the pleasure of attending the Columbus Convention a year ago.) There were a good many long faces at Pittsburg. Then times were hard, and they had been hard for several years previous; prices were exceedingly low, and everybody was feeling blue. I have already noticed a different atmosphere here, an atmosphere of cheer and hope and anticipation of something good that is coming to us all. One remark of the essayist I coincide with, and I presume it was uttered as a little word of warning for the future in regard to putting the prices too high. Those of us who have reached middle life, and many who have not, have, I think, lived long enough to see the folly of that—not so much in our line of business, perhaps, as in some others. It is not wise. There comes to my mind now an incident which occurred in our business a few years ago. An Eastern contractor obtained a contract for a very large building in a Western city, and he was going to require a number of million of brick, which was a great item to the brick manufacturers of that locality, and they put their heads together and said, "Now is our opportunity; he must buy his brick here; let us get together on this and ask him a good stiff price." So when the contractor began to ask the price of brick the first man said so and so, and the next man was just as high, and he found the price of brick away too high. The contractor said, "Gentlemen, you are asking too much for your brick. I am willing to pay a good price, but I think you are putting up a job on me." He bought a piece of land, put up a brickyard and made his own brick. Now, this is but an illustration of how these things will work. We all want good profits, and are entitled to them, but we are not monopolists. We should be satisfied with a fair profit. That is the basis of all good sound business—a fair profit on both sides. Everybody should be willing to give a fair equivalent for what they get. If they did, everything would be on a better basis, and there would be better times. I am anticipating a good Convention here. I will be glad to bid you all good cheer and take you by the hand. (Applause.)

President Gates: We would like to hear from the South. I will call on Mr. J. R. Copeland, of Birmingham, Ala.

Mr. J. R. Copeland: Thank you, Mr. President. I am from what you probably have heard called the "Sunny South," about the middle of the State of Alabama, situated conveniently close to the honorable treasurer. I had the pleasure of taking that celebrated trip through Kentucky with him yesterday, and we arrived safe and sound, as you see. I have nothing to say, I believe, along the line of improved trade conditions. In regard to a report from our section of the country, we have a nice little brick exchange in our county, containing, I believe, all of the principal brick manufacturers there. We are working harmoniously together. There is a good demand for brick, and we are getting good prices, which are not high, by any means. On the contrary, we are giving full value for every dollar received. I am glad to meet the gentlemen in the Convention for the first time, and as the brother who has just spoke has said, I look forward to much pleasure.

President Gates: We would like to hear from another new member, Mr. L. Parker, of St. Louis.

Lemon Parker, St. Louis, Mo.: I can only say I heartily indorse the statements of the three gentlemen who have just spoken. My experience has been that, on account of the competition with which we come in contact, there is no danger of getting our prices too high; and, also, because the people around us know too much, and they are not likely to stand it. I think we ought to try to get all we can within reason. I do not think we need fear that we will get our prices too high.

President Gates: I would like to hear from Mr. Eggers.

F. H. Eggers, Cleveland, O.: Mr. President, ladies and gentlemen, I was amused when I heard some of the gentlemen say, "Don't get prices too high." We have been crying for six years for better prices. (Laughter.) I do not think for a moment that the prices of brick or terra cotta have gone too high, and I believe many of us are not square from the panic that we went through. I guess there was not a concern in the United States that charged $4 or $5 per thousand but lost money, and we are now trying to get even, and I said to some of my friends this morning that I hope this prosperity will last for fifty years. There are certain times when people overdo it a little bit, and they may get a few small orders for an extraordinary price, but I do not believe that our material has gone too high now. All we want is a fair living profit, and I believe the brickmakers understand that and realize that they must keep within bounds. Take the iron and steel

F. H. Eggers, Cleveland, Ohio.

industries; see how the prices are advancing. Labor has advanced 33, 35 and 40 per cent., and steel and iron you can hardly get at any price, so I am told. But it seems to me that all of our members are enjoying this prosperity. Since I have been here it has been said by a number that after the Convention they were going to take a trip down South. You did not hear them say that two or three years ago. We ought to have a good time with all this prosperity. As has been said in our President's address—a splendid address which he read here this afternoon—that the masses of the people control these matters. If they do I do not believe there will be any danger but that we will have another four years of prosperity. I have always had faith in the American people, in the voters. I had faith in them four years ago, and I have faith in them in 1900. Many of us who have been in business for the last thirty years have never witnessed such prosperity as we have had the last two years. The factories have more than they can manage. I had occasion not long ago to want some machinery. I went to one of our machine manufacturers and I told him I wanted a brick machine, and asked him how soon I could have it. He said he could not give it to me much before the 1st of July; that they had orders that far ahead. Now then, gentlemen, with such a state of affairs existing, for heaven's sake let us do as our President said, let us next fall stand by the old party. (Laughter and applause.) Let us continue this prosperity. It lies within our power. As a rule, brickmakers are not alone brickmakers; they understand a little about politics besides. (Laughter and applause.) The brickmakers of this country are as powerful as the railroad corporations if you put that power together and work it

as they work it. I would not be afraid to-day to say that the brickmakers of the United States could compete with the Vanderbilts and J. Pierpont Morgan or any of the rest of those fellows. (Applause.) It lies with you people to do your duty, and see that prosperity will continue for another four years. (Applause.)

President Gates: We want to hear from Buffalo, and I will call on Mr. Wm. H. Brush, of that city.

William H. Brush: Gentlemen, I am sorry that after all of this political tirade by our friend here in prosperous times that you should see fit to call upon Buffalo. We felt hard times. We are, perhaps, in a different shape from most of you. We are all together, thanks to the National Brick Manufacturers' Association. We are organized, and, as our friends have said, we bear in mind not to raise prices to an exorbitant point. We are trying to live and let live, trying to squeeze out money enough to meet our bills and attend the Convention and shake hands with our brethren, and I think that is all that is necessary. I think I have covered the point about as nearly as any of them have. (Laughter.) I want to confine myself directly to the subject we are at present discussing. They are putting up a great many iron and steel structures in Buffalo. We are using a good many of these timbers from Pittsburg, made out of iron and steel. We are not putting in as much brickwork as they are in this city. The trouble at our place is they do not pay enough attention to the fire limit. I think this is a subject that should be

Wm. H. Brush, Buffalo, N. Y.

agitated by this Convention in the way that Brother Eggers spoke of, in a united manner.

President Gates: We will have later on the report of our committee on trade relations, and this subject of fire limits and several others of vital importance should be considered in connection with that. There is a friend of mine here to-day who has never gone back on me (I should say he has never gone back on me until to-day), and I am going to ask Mr. D. V. Purington to talk to you on "Prosperity and Progress."

D. V. Purington: I really think that, loving Gates as I do, when I found that he was to be elected President this afternoon, I think it was about the meanest thing that I ever did that I did not tip it to him. I confess it right here now. The discussion of this paper seems to have resolved itself down to a Methodist meeting, and we are making personal confessions of what we are doing. Prosperity has not affected the brickmakers of Chicago or St. Louis either to any great extent. We have a capacity in Chicago of about 980,000,000 of brick per year. We made last year and sold about 400,000,000, and you can readily see the condition of the trade when the supply is so much greater than the demand. We are still struggling along and trying to recuperate from the disastrous effects of the world's fair, and it will probably take six or eight years more before we catch up to the buildings that will be needed, or rather, that have already been built. I have got so I philosophize about these things a little. When the time comes, and the need for buildings exist, the supply will be ready for them. In the meantime some of the old yards are becoming dilapidated, and the machinery rusting and falling to pieces, and gradually these yards will become things of the past, and when new buildings are wanted we will be able to get a fair price for our material. I am not very much afraid of getting too high prices, although that was the trouble in 1892, when the great demand for world's fair buildings existed. We not only built buildings then, but we built brickyards; almost all of us increased our capacity, and there has never been a time since 1893 when we have not been able to make more than enough brick on the old yards, without reference to the additions of 1892. Progress and prosperity go very well together. We do not get a great deal of progress unless we have prosperity, and when we have prosperity we progress very rapidly. (Applause.)

President Gates: We have a gentleman with us to-day who has not been with us for a good while. He has been out of the business for some time, but he has not been out of the business of thinking, and I know you will all be glad to hear from Mr. George S. Tiffany, Tecumseh, Mich. (Applause.)

Mr. George S. Tiffany: Mr. President and gentlemen, I thank you for the honor of being called upon. I have not been a member of the organization for several years. The misfortunes attending hard times injured my health and business considerably. I have been interested in the question under discussion. I believe this question has never been discussed in any Convention that I have attended. I do not know how to illustrate my idea of it any more than to tell a story that I used to hear my father tell. He told of two parties who were married. The old gentleman said all he wanted was to get rich, and all his wife wanted was to be comfortable, and then he said, "I have been rich these twenty years and my wife never has been comfortable." The question of prices all depends upon the demand. I do not think there will be an increased demand for brick until we make it. When you consider that nearly all of the buildings throughout the country places and villages are made of wood, and yet we know that brick is the best building material, it seems that there ought to be a way by which you could introduce your material more effectively. I believe it could be done in various ways, improved methods of construction, better quality of brick, by the manufacture of brick that do not require to be painted, and in various other ways. I will not take up more time at present, but I may have an opportunity to speak to you later on.

President Gates: We would like to hear from Mr. Fawcett Plumb, Streator, Ill.

F. Plumb: I regard myself as a new member, and I think perhaps I had better do a great deal of listening and not much talking. However, I want to say so far as our locality is concerned, there is not very much danger of our getting our prices too high. We are between the upper and nether millstone of competition on one side and organized labor on the other. We have got to keep our prices up to keep out of the way of organized labor; we have got to do that. We are in no danger of getting them too high, for our competitors will keep us out of any danger in that line. The question of organized labor is, in my judgment, going to be a serious one. I do not know how it will be with you. At the head of the labor market are shrewd, careful, observing men, who are just as careful of their interests as we can be of ours, and they know what is going on and are pushing the employer to the very last inch. I do not know that I have any right to speak of Chicago, but I imagine that interests in Chicago are somewhat tangled up along the same line, and the builders and contractors and the labor market are all in a turmoil. I do not think we need any caution on our part. It will all be taken care of for us.

President Gates: We want to hear from the fresh blood of the organization, and we want to hear from them early in the proceedings. I would like to hear from the new members. Let us hear from you as to prosperity.

Mr. Ittner: I would like to hear from Mr. Burr Blair.

Mr. B. W. Blair: Mr. Chairman and friends of the National Convention, I had hoped to have the privilege of coming here and enjoying the discussions without entering into them. I am happy to be here and meet so many old faces. During the last four or five years in Cincinnati we have gone through all the terrors and hardships of hard times, but we thank God the worst is over, and we have the prospect next year of better times. I heard of a sale of some brick at $6 and another at $7 for the ensuing year, and if steel don't enter too much into the construction of buildings we will have good times. We are about to erect a skyscraper of eighteen stories. I was caught in the vortex of hard times, and went under, but I now have the prospect of starting new again at the bottom, but I am thankful for the National Brick Manufacturers' Association and my good friends here. We thought at one time that prosperity would never return again. I was reminded of that quotation of Shakespeare's, "A jest's prosperity lies in the ear of him who hears it and in the tongue of him who utters it." I thought it was reversed, and the jest of prosperity lay in the tongue of him who spake it and not in the ear of him who heard it. I am glad politics will be

eliminated from the country. We want to go back to business, and not discuss the silver and gold question any more, but make more brick and let Mr. Purington increase his output from 400,000,000 to 800,000,000 or 900,000,000, and then will come the great benefit if we are true to ourselves and husband our means and husband our resources and lay by a little sum for a rainy day. Then let come the other quotation of Shakespeare,

"Sweet are the uses of adversity,"

which has taught us to do this. (Applause.)

President Gates: We have a long programme mapped out for this Convention, and the probabilities are that it will keep us busy to get through with it in the allotted time, but there is another very important part of the Convention that we do not want to neglect, and that is the social intercourse about the hotel lobby. In order that we may have some time for this social intercourse with our friends a motion to adjourn is in order. Adjourned.

SECOND SESSION.

Thursday Morning, 10 a. m.

President Gates: Gentlemen, the Convention will come to order. I am sorry we are so late this morning, but it seems unavoidable.

Secretary Randall: The first number on the programme is a paper entitled "Business Methods in Clayworking," by Mr. O. T. Denison, of Mason City, Ia. Mr. Denison has been a member of this Association for a number of years, and promised to be with us and read a paper on this occasion, but he is not here. I presume he is detained at home by something beyond his control, and I would suggest that we have some of our good business men discuss this question.

President Gates: I would ask Mr. Bloomfield to lead in this discussion.

—Business Methods in Clayworking—General Discussion.—

Mr. Bloomfield: Mr. Chairman and gentlemen, they have rather sprung this thing on me, and I am not prepared for any discussion. I am reminded of an incident in my boyhood career. I was always ready to give recitations, and this time I remember well I mounted the rostrum and said, "Friend and Roman citizens, I came not here to talk," etc., and I am in that position to-day, and I expect to be as long as I am a member of this Association. I come not here to talk, but to study and to learn, or rather to imbibe knowledge. In the first place I am not a manufacturer, simply a digger of mud, but in my walk through life I have been a pretty close observer of what is going on around me, and I am sorry to say the results of my observations have been that I have noticed a decided lack of business methods in clayworking. My attention was called yesterday morning to this fact. I was talking to a gentleman from Beaver Falls, and I told him that it struck me as being the fault of the clayworkers. This gentleman, a manufacturer of fine ware, pottery, had taken the trouble of investigating the cost in a business way of his material. He said that his observation had been that most of the manufacturers would fill a kiln with ware and then burn it, and then take the gross results of that kiln and the gross costs, but he had adopted a different method, and I think it would be a good plan for all clay manufacturers. He took the cubic contents of that kiln and charged the different wares with the number of cubic inches they each took, and by that means got the cost of the burning of the different products, and by continuing this method he knows the cost of each kind of ware, and he is manufacturing a great many different articles. I find that in the line of industry with which I am connected that this is something that is entirely left out. The manufacturers burn their wares, and they do not know after a kiln is burned what it has cost them. The manufacturer ought to know when he is through with the burning of a kiln what every article in that kiln has cost him, otherwise he does not know what to charge for it. He may be putting his goods on the market at a steady loss. He thinks he is making something on it, and that seems to be the only thing that the manufacturers know. I may say that in the mining of clays in the State of New Jersey there is not one in a hundred who knows what the clay costs them on the car. If, at the end of the year, they happen to have a few dollars it is all right. If they have lost they do not know where it comes in. With me, I have a report every morning. I know what every man has done, and I know what every pound of clay has cost me, and by that means I am enabled to clip off the losses and make changes that are necessary to make the business profitable. If I had time I would have been able to go into this thing a little deeper, and I am sorry that I am not able to give you something that would be of some advantage to you on this subject.

President Gates: This is a question of very great importance, and tells on the expense account. This gentleman that Mr. Bloomfield has referred to gave us a valuable paper in the Ceramic Society. It took my mind back to the old times, if you will pardon me for speaking of it, when I was in the drain tile business, and the method of handling our ware was entirely different. Each small manufacturer mixed his ware up, and the only idea with which he seemed possessed was that he must be satisfied if he could make his tile cheaper than his neighbor. There was no such thing as keeping up prices. There was a price list, but it was only for the purpose of cutting. A buyer would send all over and get the price lists from the different yards, and then he would go to one yard and ask the price of tile, and when he was told what it was would state that he could buy tile a good deal cheaper from so and so, and this was the only use made of the price list. The importance of getting these figures at an early stage of the game is very great. I would like to hear from Father Pike on this subject.

E. M. Pike, Chenoa: I, too, am like Mr. Bloomfield. I came here not to talk, and to be called up like this, on the spur of the moment, to talk about something I do not know much about, is rather embarrassing. There is no question but that we need to practice business methods in clayworking, and if I can add my mite to aid the new members to take a lesson from what we have already learned, I am willing to do my share. One of the first steps in business methods is in the selecting of clay before the plant is started. As we know, a great many of us have started in, and then afterwards located ourselves, and found a yard without any clay; that is, the clay would be practically worthless, and would require a great deal of manipulation to make anything out of it at all. That is where we have failed—in not having the proper clay. Good clay is essential in making brick. It is essential in anything in the line of clay products. As Mr. Bloomfield has stated, I think it is a good plan to follow the expense account and see just what every detail is costing. I do not know that in my experience I have ever known just how I stood at the end of every day, but I think it is well to know what we are doing. There is a satisfaction about it, as well as the knowing. We are more liable to be able to call a halt on the losses, as Mr. Bloomfield has said.

Chas A Bloomfield, Brooklyn, N. Y.

President Gates: I would like very much to hear from some of the men who have ideas on the subject, and from whom we have not heard, as it is impossible to get hold of the more recent members. I have had a few very delightful experiences from having a number of them come up here and speak to me, and I am more than delighted to meet them. Can't we hear from some of them now on this subject of business methods?

Mr. L. Parker, St. Louis: I would say, in regard to our business, we have about five different departments, including fire brick, retorts and fireproofing. A retort kiln holds about twenty-five tons of fireproofing. A kiln of the same size holds about thirty-three tons of tile and brick mixed. We always mix them. When we have a tile kiln it holds fifty-four tons, and fireproofing runs about seventy-seven tons, and we can arrive at the cost of burning of each one of these kilns, and, of course, we know what it costs to set and empty each kiln,

and we pursue this plan throughout the entire process from the clay pit to the finished article.

Mr. Hoagland, Findlay, O.: I do not know just what has been said on this subject, as I came in but a moment ago, but it occurs to me that there are many points brickmakers should consider in their methods of marketing their product, and when you refer to a man's method of doing business as much importance is attached to his method of dealing with the trade as to his manner of handling the manufacturing end of his business. After he has succeeded in getting out the best possible finished product from his raw material, he finds that he is forced to put into his "first quality" grade a certain percentage of checked brick; then he should, in sending out samples, which are to represent his deliveries, put in a correct proportion of checked brick, which will give his agents and customers a clear idea as to what they are to expect in his deliveries.

You sometimes find agents who, in working on a commission basis, will pick out of the samples sent them by the manufacturer the very best brick they can find, and represent to the trade that the delivery will be equal to the brick submitted; this makes it easier for him to make the sale and secure his commission. After the manufacturer has supplied his agents with fair samples, he must see to it that they are correctly presented to the trade, and a distinct understanding should be had with the agent that he will be held responsible to the extent of his commission for any brick being rejected on account of unfair representation.

It is not in accord with good business methods to misrepre-

W. H. Hoagland, Findlay, Ohio.

sent your material to the trade, and yet in the pressed brick business we find instances of it every day. It is sometimes due to one manufacturer's inability to turn out as good a product as his competitor, and at other times to a "middleman's" selfish motives as regards his commission, and occasionally you find a brickmaker whose original intention is to start his deliveries with first-class brick, and, after the building is partially completed, finish the operation with second-class material, which enables him to make his price below and out of the reach of his competitor, who is bidding on first quality goods for the entire delivery. The results of such a method will in time prove unprofitable to the man who follows it, for he experiences losses from rejected bricks, reductions on invoices, and a bad reputation in the end. This method not only affects the guilty party, but it has a demoralizing effect on the market price of the commodity, for there are always many persons to tell you that Mr. ——— is selling first-grade brick for a price much below yours, and if you are not familiar with this man's business methods you may be induced to meet his price, if it is possible for you to do it, or take it at a price that will net you no profits. Your action has its influence on the market price, and so the price goes down.

I think it is a good plan for every manufacturer to get personally acquainted with his competitors and become familiar with their business methods. We are oftentimes imposed upon by being misled as to what our competitors are doing. We may get a report that he has done something very unbusinesslike directly against us, and if we are not familiar with the man's business methods we may believe the story, and be induced to do something we would not do if we were personally acquainted with this competitor and believed him to be a man whose methods of doing business represented good judgment and the highest standard of ability. We should see to it that our own business methods are not faulty and will stand as a good example for our competitors.

Mr. Eudaly: Business methods in brickmaking cover such a vast field that they take in everything from the start to the finish. While some of the friends were talking it occurred to me that competition seemed to be the thing most dwelt upon. I was just thinking about this question of competition. Now, if it were possible for every manufacturer to make up his mind that he would not sell the products from his plant except at a reasonable profit, no matter what his competitors did, would not that be a good stroke in business that would go a long ways in putting a stop to ruinous competition. If a man would say he would not sell his wares except at a reasonable profit, then, so far as he was concerned, there could be no ruinous competition, and he could not go into debt; but his competitor, who had sold his brick below a reasonable profit, would soon have to quit the business himself and leave the field to the one who would not sell except for a reasonable profit. I believe, if carried out farther, if the man will not sell his brick below a reasonable profit, he will soon find that some other competitor is underselling him; he will take it for granted that if his competitor is getting a reasonable profit at the price he is selling his brick, then he must see that there is something wrong with his method of manufacture. If Mr. Jones, on this side of the city, is selling his brick at a lower price than Mr. Smith, on the other side, and both are asking a price that means a reasonable profit, and one cannot afford to sell at that price, then there is something wrong with his method of manufacture, and if he is a progressive man he will at once set about to find the trouble. We often hear comparison of the methods of manufacture. This subject is so broad and wide, and there are so many things that should be considered. I like very much the suggestion of Mr. Bloomfield of keeping accurate account every day of what is going on. If, at the close of a day's work, after balancing the business for the day, any first-class bank lacks a penny, it never quits until it finds where that cent is. This is true in all our large business establishments. Not a bookkeeper submits a balance sheet that does not balance correctly. If there is an error, they never quit until that mistake is found. We take too much for granted in our business. Do you know that the brickmakers do more things by the "I-guess-this-will-do" theory than any other class of manufacturers? I do not know of any other class of manufacturers that does things upon the "I-believe" and "I-suppose-so" theory.

Mr. Bloomfield: I want to say just one word. Mr. Eudaly says we must not sell our material unless we can make some money. Mr. Eudaly has lost sight of one fact: that one period of life generally comes to every manufacturer, and that is a lack of funds. Many a man is compelled at times, as obligations press upon him, to make some sacrifice for the purpose of getting some ready money to meet obligations, which, if he don't meet, means bankruptcy and loss of credit. The only help I see for that is local organization. Self-preservation would necessitate local organization, where the men come together, and where, if necessity comes up and the business man has to have a little money, they take a bill of sale and advance him the money, rather than have him cut the market. Good business methods would bring about good local organizations, where the men would help each other.

Secretary Randall: The next is a paper entitled "The Clay Age," by Fritz Wagner, of Chicago. I am very sorry to announce that he cannot be with us in person. He has a strong personality, and would add much to the paper by reading it himself. He has sent the paper to me, and I will read it for him.

THE CLAY AGE.

By Fritz Wagner.

Gentlemen and Fellow-Workers:

I should like very much to be with you and tell you a great many things I don't know about the "Age of Clay." As it is, I just beg to remind you that the "Age of Clay" began six days after the Lord had divided light from darkness.

He might have made Adam from beautiful marble or solid granite, but he preferred to model his likeness from a lump of clay. He burned it in his fiery breath, and man was created. Adam saw his likeness in the spring and thought he was a brick.

Like your own, these bricks have spread all over creation; all made from the same model, but ever varying in size, shape and color—red and yellow, white, black and brown, in hundreds of shades, straight and crooked, plain and fancy, hard and soft, bright and brilliant or dead and dull, are they met with throughout the world.

Most of them, of course, are common, and many are tramped

upon, but a few are select and are apt to rise high in the world if they show good grit and sand.

Now and then we find some which are perfectly square, but most of them have small imperfections. Some of the prettiest ones are said to be painted. Some of them are very tough and close, but the poorer ones are porous and absorb a great deal of water in hot weather, while others must be treated with stronger fluids.

Many are well bedded and must be held close to the line; otherwise they will go out for a header and return on a stretcher.

Some of them go to the front, but without thorough backing they are apt to fall and burst, while others suffer from too much expanding, for which reason many prefer contracting.

Some have gone through the mill and are quite smooth.

Some can be bought at moderate prices, but those prevailing in public buildings are usually very expensive.

The best ones are not in the market.

The climate has great influence on their qualities.

In Kentucky they suffer sometimes from internal tensions, because they are quick firing, but they are known for their resistance to water.

Those in the South get hot very rapidly, and are therefore subject to many cracks.

Generally speaking, they are softer in the South than in the North, but there are some in Africa which are very hard to crush, while those in the Philippines offer little resistance to Uncle Sam's improved testing machine.

There are, however, no foreign machines built strong enough to crush our own home products.

Those on the outside of churches are promised a second and final burning, but many need a fresh roasting every day.

I deserve that now for failing to live up to my promise, but my excuse is that I belong to those called "pressed," which are, however, quite common in this country.

We may well be proud of our trade, for the Lord was its first master and the first one in the business.

The "Age of Clay" began with man and will end with him.

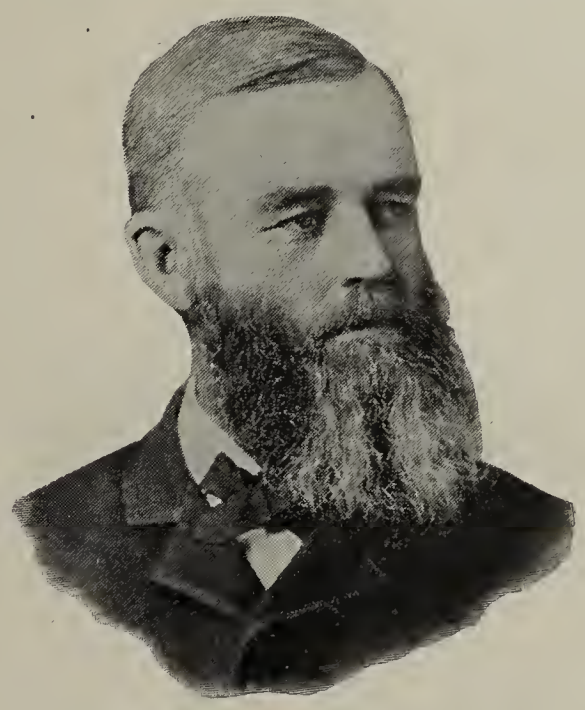
I hope you will have a good time, and may the old Master of the trade be with you. (Loud applause.)

—The Clay Age—General Discussion.—

President Gates: I, too, am very sorry we lose the personality of Mr. Wagner. I was thinking when the Secretary spoke that there was a time when I thought Fritz Wagner wore horns, but I have changed my idea. He is my competitor, and you can judge my feelings when I tell you that the man who writes that paper is at home getting orders that I should be wrestling with myself. (Laughter.)

Secretary Randall: We are going to ask Mr. George S. Tiffany to lead in the discussion of this paper.

Mr. Tiffany: The paper is one that will hardly admit of any discussion. It is full of wit. It is just a paper to laugh about, not to discuss; and then, too, I am under very impressive orders from my good wife. On leaving home she said to me: "Now, George, don't try to be witty. You appear to very poor advantage when you try to be witty. You must be dignified." So I do not see how I can discuss this paper. If I should take any exceptions to any of the remarks it might be considered too serious, for there is nothing serious in the paper itself. In regard to the age of clay, I might, perhaps, take exception to the statement that it commenced with the creation of man. There should be some indication of that far better than we have at the present day. It is said that it took fifteen generations of men to make a Gladstone. It has taken at least six thousand, if not more, to make a brick, and to make such a brick as we want. I took a delightful interest last night, at the Powwow, in listening to Brother Purington's talk and listening to his manly statements and confessions, that plainly told us that he was not satisfied in regard to the progress he has made, and that he was looking for something better. He wanted the Convention to define certain things to govern him in his business. He is a man who knows as much about brick as any one in this Convention, and he is still looking for something better, and so are all of us. The age of clay has not yet come. Just consider for a moment how little your material is used, right in your own cities, every one of you. What per cent. of the buildings are of brick and what of wood? I took up that question in my own town, and we sat down and counted them. It is a delightful little village of 6,000 inhabitants. There were less than fifty houses of brick, about 8 per cent., and about half of these were painted brick houses. Just think of it! That left only about 4 per cent. of the houses to testify to the value of brick as a building material. What does this mean? It is something worth your consideration. Can a better house be built of brick than of frame? You know it can, and I know it can. Why should the people not know it? What is the cause that prevents us from introducing our material? I did not estimate the business houses, but just the dwelling houses. I may add that this thing holds good throughout Ohio, Indiana and Illinois. They are sending up to Michigan and over to Canada for lumber in order to build houses. I think this should be corrected in some way. It is time we should build houses and homes of brick. I built a house, or, rather, I changed a barn into a house, and made a very pleasant residence of it. I could not build it all of brick, because the frame stood there, but, just for curiosity, I made a little estimate, leaving out the frame and the windows and doors, everything that is common to both constructions, and I found that to build the same walls of brick would have cost me less. To build it of frame would have cost me $200; to build it of hollow block, well, about $250; to build it of brick and lath and plaster it would have cost about $300. Now, you make these estimates, and prepare yourselves to use arguments and show a man how much better and cheaper he can build a house of brick than he can of wood. It was remarked by the Mayor yesterday that the art of brickmaking was one of the lost arts which had lately been recovered. I do not think so. I do not think there were any conventions in the time of Pharaoh. I do not think there were any brick machines in ancient Egypt. There were no trade papers. Pharaoh never got the idea of making brick without straw from any clay journal. They had no such advantages as we have now. Our trade papers and our conventions and our associations in life are infinitely superior to anything that has ever before existed. Machinery is a modern institution, almost within the lifetime of many of us here. In those ancient days they had no steam engines, no telegraph, no railroads. You see, the railroads first originated in the thirties, and



George S. Tiffany, Tecumseh, Mich.

the brickmaking in those ancient days was carried on by serfs and slaves. They ground mud with the tramping of cattle and their own naked feet, and picked out the stones with their hands, and they molded the brick with their hands, and burned them in some sort of a kiln—I hardly know what—and I have no idea that a better brick has been made before this century than has been made in the last twenty-five years. I do not know that we have any paving brick represented in ancient work; perhaps there may be. Gentlemen, I am glad to be with you and talk on this subject, but I am more pleased to see the kindly expression in your faces and feel the kindly grasp of your hand. (Applause.)

President Gates: I dislike to call out individuals, but I am anxious to hear from Mr. George M. Fiske.

Mr. Fiske: I am sorry myself that Mr. Wagner is not here. I have had the pleasure of meeting the gentleman once or twice, and I had anticipated the pleasure of meeting him again and of hearing what he had to say from his own lips. I was surprised when this paper was read, as I was expecting something different. I know he understands his business thoroughly, and is a very bright man, and so I was looking for something different; but still I am glad he has given us what he has. I think it is a lesson to some of us who are apt to get up and drone out something heavy. I noticed that he said more about the *age* of clay than he did about the *clay age*. I suppose that what is really meant by the "clay age" is something like the "stone age" or the "iron age" of which we read. That is, a time when clay should be the principal material which is used in the construction of build-

ings. Have we reached the clay age? I think not. Shall we ever reach it? I fear not. The conditions are very different from what obtained in those periods. I imagine that the reason they had the stone age was because men of that time, for some cause, turned their attention more particularly to stone, and thus brought on the "stone age." Similarly as to the "iron age" it was for the same reason. Now, the men of our day will never turn their attention to any one building material. Those who are interested in stone and stone buildings will never turn from them to clay. They will, on the other hand, do all they can to improve their material, and we have seen it done very largely. The same is true of those who are working iron. All that we clayworkers can do is to see to it that we hold our own, and to do it we must apply our best business methods, which have been spoken of here to-day. First of all, we must put out good material. That is the only hope of any particular line of building material; the stock must be of the very best. It has not been so very many years since the use of architectural terra cotta was introduced here in this country. At first a great deal of poor material got out on the market, and it retarded the use of terra cotta very much, but we have passed through that experimental age, and we now have in this country many men who understand the manufacture of architectural terra cotta thoroughly. We have so many workmen who understand this business that there is no excuse for material being put on the market that is not first-class. We may say the same, of course, of brick, and especially of fancy colored brick. It was only a few years ago that they were introduced into favor, and at first a great many poor brick were sent out, brick that were soft, and you know that, while a soft

T. P. Plumridge, St. Louis, Mo.

red brick can be used and the difference in color not be noticeable, when you try to use soft buff brick you get a dirty-looking wall. Great improvement has been made, and most of the brick that are now on the market are free from that objection. I am a firm believer in clay and clay building material, and I believe there is a great future before it. I have seen as large columns as those here in this room built of clay, that would stand every strain put upon them, while columns of like size made of stone would go to pieces under the strain of fire and water. I believe a great deal of progress will be made in our business. It has been spoken of here of building houses of hollow blocks, and I believe that is something that will grow, and when our skilled terra cotta manufacturers take up that line of work and begin to produce, as I think they can, machine-made architectural terra cotta, then I believe you will see a large increase, and the time will come when the homes of our common people will be built of hollow clay blocks, and they will be beautiful homes, and free from the danger of fire. In coming along on the road from Buffalo —I think it was in the vicinity of St. Thomas—I was looking out of the car window, and I was struck with the number of houses built of brick. Here were modest and moderate cost homes, often but one-story houses, in a country village, where they seemed to know the value of brick. We do not see that in the States, but that is what we want to see—the homes of the people built of clay—and I believe the time will come when we will see it, and the next twenty-five years will see the use of clay products in this country doubled. (Applause.)
see it. (Applause.)

President Gates: I see Mr. Plumridge over there, and I would like to hear from him.

T. P. Plumridge, St. Louis: I came more to listen than to talk. It happens that during the last year and a half I have traveled considerably over these United States, at least over the central portion, in the interest of terra cotta, and I am thoroughly satisfied that the references of Mr. Wagner are true. This department of terra cotta is one that is growing very rapidly. Now, in regard to Mr. Fiskes' remarks about the homes of the working people: If any of you have been in Europe you will know that a great many of the homes of the middle classes in England are built of brick. I remember that several years ago I was over there, and was invited into the house of a manufacturer who did not pretend to very much style, but he lived comfortably. He showed me through some houses that were being constructed. In the hall the wainscoting was of enameled brick; the hall floor was made of tile; the area ways were of a second-grade enameled brick. That age is coming to this country. We are, of course, anxious to develop the clay business, and we are pushing it; at the same time it is coming, but it is coming in a different way. We have two classes in one profession, and I do not know that I can distinguish them any better than to say that some are "ark-itects" and the others are "architects." The first use terra cotta very largely, and the others are following them very rapidly. It is a question of following your leader. I speak from personal observation. In St. Louis we are large users of brick. I think there are more brick used to the number of inhabitants than for any city of the same size in the country, and the small architects are putting this material into dwelling houses, and into stables, and into buildings where you would not have dreamed it would be used three years ago. Another way to get before the people is to keep on as we are doing through our clay journals. The people are gradually becoming educated. It was stated yesterday that it was very hard to get iron, and that the demand was far in excess of the supply. Now, why would it not be a good thing to go back to first principles in building these large warehouses, as long as they cannot get iron, and induce the architects and contractors to use a large amount of heavy brick walls? The time is here, as we heard yesterday, of prosperity. It has not quite struck us in St. Louis yet; no doubt it has struck those in the Central and Eastern States, but it has not struck the Western States. But as iron is so scarce, why not agitate the question of using heavier brick walls, and so facilitate the erection of the building and getting the tenants in it?

President Gates: There is one other line we have not heard from. You gentlemen had me on the anxious seat yesterday, and now is my chance to get back at you. I happened, some time ago, to have an evening in Terre Haute, Ind., and, as I always do, I hunted up our clay friends in the town, and I ran across Mr. W. P. Blair, and he made it very interesting for me. He has done some splendid things in the way of introducing vitrified brick in Terre Haute, and I want to hear from him this morning.

Mr. W. P. Blair: I do not know that it is a fair thing to call on a fellow the very first time he ever was in a National Convention. I am pleased, however, to add just a little testimony. I cannot call it anything else. I cannot call it information, and it should not be information to the members constituting this Association. We find in the manufacture of vitrified brick that the widely extended uses have almost come to us without solicitation. In the first place, we find that in many localities the cellars or basements are so damp and so uncomfortable that they are unfit for storage of almost all classes of goods. The owner of one such basement, who was unable to realize anything out of it, came to us and said: "Can't you do something for us? Can't you make a brick that will give us a dry basement?" The demand was supplied, only to be followed by wants in this, that and another direction, so the result has been—at any rate it has been our experience, and should be the experience of every vitrified brick manufacturer in this country—that our trade is constantly on the increase. I was very much pleased to notice the other day—this is right in the line that the gentleman who has just preceded me was speaking of—the item in regard to the scarcity of iron. I was pleased to note that an architect in Minneapolis and St. Paul, one who has established an international reputation for himself, had the planning of a large building in New York city, and had specified that the walls be built of vitrified brick. Other leading architects of the country have been so impressed with the value and durability of such material, as well as the Treasury Department at Washington, that it has been decided that Mr. Gilbert is to make the plans for the new custom house in New York city, and that the walls are to be built of vitrified brick. The railroads in this country have been asking themselves for several years past what it is they can get to take the place of so much of the stratified stone that we have been building our bridges and culverts with. We put in this stone and it ought to last for ages and ages, and yet we find

it giving out after fifteen years' wear. Now nearly every vitrified brick manufacturing concern in the country is shipping brick for railroad culverts and bridges. We had a very handsome building that was to be built of stone, and the architect came to me and said: "I want something to preserve the color of the superstructure of this stonework. I want something that will stand the weight and keep the stone looking as it does when it first goes into the wall." I told him we could give him a vitrified brick foundation that would not carry the moisture, and we did. That was two years ago, and that building stands to-day, a stone structure on a vitrified brick foundation. This architect wanted it in order that the building would always stand true and the stone retain its original color. The use of vitrified brick in the construction of sewers must necessarily become an acknowledged necessity; problems of sanitation and economy alike demand that this be so. I might go on and cite hundreds of instances that are extending and widening the uses of vitrified brick all over this country. I see no limit to it myself, and it is not only in our lines, but in the lines of the terra cotta people and the dry-press people, and in all the various lines of clay manufacture. It is within our power to make this really and truly a clay age, if we will only enter into the spirit and take advantage of the wants and needs of the people. (Applause.)

President Gates: I want to say the chair has made one success if it never makes another in this Convention. I called on Mr. Blair just as soon as I could after he got in, and it was a success. Our time is nearly up, but I want to call on one other—Mr. Alfred Yates.

Alfred Yates, Johnsonburg, Pa.: This is a vitrified brick age, somewhat limited at the present time, but it will grow. Look across the water and see where the vitrified brick are used—in all the damp courses. Staffordshire blue brick and Portland cement are being exported to all quarters of the globe. Combining these two materials, you could make a reservoir in the basin of the sea absolutely dry. I discovered this fact in Boston. For the last twenty years, on the back bay, they filled in very many acres of land, and, the land being low, there is a certain amount of dampness; you will see it on the walls. This is shown, for instance, by the paper on the walls, which will easily come off; if you take hold of it at the bottom you can rip it right off to the top. This moisture is gradually permeating through one course of brick after another. On the other side of the water they put in two courses of vitrified brick, and then the dampness will rise to that course, but no higher. We can all see this damp course in every building, and I think this is another one of the uses to which we can put vitrified brick.

President Gates: I dislike to leave this subject, but as we have many other things to discuss I will ask the Secretary to announce the next number on the programme.

Secretary Randall: I am requested to announce that a Detroit photographer desires to make a picture of the gentlemen present. The word has gone forth that this is the handsomest body of men that has met in Detroit for many months, and they want to perpetuate it among themselves. There is a lady present who would like to know if the gentlemen present will assemble at the ladies' entrance of the hotel at 12:30. If they will do so, there will be a photographer ready to take our pictures.

On motion of Mr. Eggers the Convention voted to assemble at the desired place and be photographed.

Secretary Randall: The next formal number is a paper entitled "The Man Behind the Pug Mill," by J. R. Copeland, of Birmingham, Ala.

THE MAN BEHIND THE PUG MILL.

By J. R. Copeland.

Mr. President and Gentlemen of the Convention:

Three or four months ago, shortly after I became a member of this Association, I was requested by Mr. Randall, the genial Secretary of the Association, to prepare a paper to be read before this Convention, and he was kind enough to suggest a subject for the paper; and while I am not quite sure that I formally accepted the invitation, for I am not much accustomed to public speaking, I think I may have left the impression on his mind that I would prepare the paper, but there was for a considerable time much doubt as to whether I would be able to attend the meeting of this most august body, and as I did not care to write the paper and not be present to have it read, I delayed the preparation of it until very recently, when I finally determined that I would leave the yards to take care of themselves for a few days, while I would take a day off and meet the brethren of the craft of clay molders and see if I might not be benefited thereby. I consulted the honorable Treasurer of the Association, and he said he had not missed one of the meetings for eight years, and would not miss one for a good deal, so I decided to put myself in his care and come up here and see what I could learn from contact with the best and brightest minds in our calling. I am highly sensible of the honor conferred upon me in being requested to make an address before the Convention, for I am not yet even a yearling, and most of them are venerable, either in years or in membership in this body, and I feel that I am scarcely equal to the task of giving them information or instruction; but as I have engaged to prepare the paper, I will read it and ask the honorable members of the Association to deal gently with me this time, and I will never do so again.

While the brickmaker of to-day has a very great advantage over his predecessor of a few years ago, having sources from which to draw much valuable information, obtained at great cost by the various manufacturers of brick machinery, who have added their experiences from year to year in their up-do-date brick machines (and the brickmaker naturally goes to them with his troubles in handling his product), still, with all the assistance obtainable from this source, there yet remain many points where he cannot rely upon this quarter for help, and it is left for him to work out and solve various questions as best he can in each individual case.

In taking the product of any modern brick plant, whether the process be soft or stiff mud, from the cash account, where it ends, back to the clay pit, from which it started, and from which place it is handled in various methods and passes through the management of different hands, to all of whom there is credit due in their several departments, I know of no one to whom credit should more properly be attributed than to the man behind the pug mill. To the casual observer he would seem to be rather an unimportant factor in the process of brickmaking, whose only duty apparently is to keep the pug mill going, but the real facts are that to this man, and to the proper discharge of his duties, must be credited, to a great extent, the success of the entire plant. Whether the material handled be shale, hard or bastard

J. R. Copeland, Birmingham, Ala.

fire clay, or the finest pulverized, soft, plastic clay, he has to exercise the greatest care in the proper mixing of the same, and the adjustment of water and steam at such particular time and place as will produce the desired effect upon the materials handled. And should he fail to exercise due care and diligence in his various duties at all times, wrath of the employes who handle this product under him will be heaped upon his head as they see, when it is too late for correction, the evil effects of too much or too little water, as the case may be, which, in an unobservant moment, he has allowed to run into the mill. But as it takes several minutes for the material to travel from his position to that of the machine tender, where the error is first discovered, the advice given him by the machine tender is, of course, too late to be of any service, as the mischief has been accomplished and cannot be undone. Not only this machine tender, but the other men, on to the hacking or dumping table (whose wages, in most instances, are regulated by the success of the product they handle), chip in with their advice how to run the pug mill, and their remonstrances as to the carelessness of the "man who has nothing to do," as he is generally called, when the fault, perhaps, does not arise from any inattention on his part at all, but from the conditions and changes over which he may not have control, perhaps from the material coming to him in a changed condition, which is liable to occur at any moment, and none but those of long experience are able to detect such change at once and to keep a continuous flow of unchanged product from the machine below. And while this man is doing all in his power to bring the product up to the capacity claimed by the manufacturer of the machine, it seems to many of the other employes that any one who has

apparently no more to do than he has could fill the position, at all times and under all circumstances, more advantageously than is being done by the one whom they accuse of carelessness. And not only do the men heap coals of fire upon his head, but at times the superintendent cannot help listening to the tales whispered in his ear that "we could have finished earlier yesterday and the day before, too, if we only had a man up there who understood his business," all of which may be, for a time, unheeded by him. After a while he, too, will almost come to the same conclusion, namely, that it should be handled more successfully, and then perhaps he will try his hand some day when there is no one of importance around, just to show the boys that it can be done. But you will invariably have to get the information in a roundabout way as to what degree of success he attained, as most of the boys are afraid to tell it on him in his presence, and each one of them is made a little more eager to show his ability along that line by the superintendent's failure, as it happened (as it generally does) that he, too, failed. There is only one way to convince them all that it requires any skill to fill the place of the man behind the pug mill, and that is to allow each and every man around the yard to try his hand at it from time to time. But should the regular occupant of the post behind the mill be prevented for any length of time from attendance at the place a close observer will remark, not only a shortage of cars in the daily output, but will find an accumulation of bats in the kiln, which the setter, in many instances, attributes to the improper working of the dryers, or to the hackers, or to the dampers, or he will assert that the machine is of no account, and will proffer lots of worthless advice about throwing the machine in the scrap pile under the shed, and of getting a machine that he used to set bricks from that did not make any bats at all. Now, all this and many other kinds of suggestions can be duly appreciated at certain times, and to a certain extent by the brick-

B. W. Bennett, Muncie, Ind.

maker, but should his liver be "a little out of order" patience ceases to be a virtue when he sees a very large percentage of his product in bats at the shipping end of his kiln, when he was expecting only a very small loss from that source. Much of this loss can be attributed to its proper source, for brick which were put in by the setter with the belief that they were all right have been checked, cracked or broken from improper pugging of the clay while in the pug mill, and dry particles of clay can easily be observed to be largely the cause of the excessive loss.

While the troubles of our man behind the pug mill are, to a great extent, the "location of water," it should be a source of great consolation to him to know that he is not the only one who has troubles along that line, as the location so far from salt water of a certain strip of clay is worrying our old friend John Bull to the extent of a million a day (not, however, of brick); and had this location been other than it was found we think the results might have been other than the sea lion's climb of rugged kopjes by day, only to retrace his steps at night. This matter of location of water is troubling not only the people on whose possessions the sun never sets, for the highest and lowest in our own wonderful country are sometimes much bothered by reason of the improper and untoward location of water. One of the "continuous" candidates for the highest honor in the gift of this country is reported to have met, a few days since, in the city of Brooklyn, "in the enemy's country," a ragged urchin driving a pair of diminutive goats hitched to a wagon, whereon was a small keg of water. The candidate asked the boy if he could be induced to sell his team, and was told by the boy that they could be bought for one dollar apiece, whereupon the candidate told the boy that if we only had free silver in this country he could get two dollars apiece for the goats. "Yes," replied the boy, "and if I only had this keg of water in Hades I might get a better price for that, too." (Applause.)

—The Man Behind the Pug Mill—General Discussion.—

President Gates: I would like to have Mr. J. E. Clapp, of Vicksburg, Mich., lead in the discussion of this paper.

Mr. J. E. Clapp: The paper just read treats the subject so fully that there is little I can say. I find, in my own experience, that a great deal of trouble results from the man behind the pug mill not getting the clay tempered properly—more than from any other one thing on the yard. Many times, though, he is not the only one to blame. It depends very much on the condition of the clay when it is brought to him. It depends upon the weather. I think his is a very important position.

George J. Walter, Chatsworth, Ill.: I am not much of a speaker. In regard to the man behind the pug mill, I will say, as did the last speaker, that his is a very important position. It has been about six years since I began grinding my clay in a dry pan and then pugging it through the pug mill, and I would not think of going back to the old way. It is a very hard matter to put any man behind the pug mill and have him make a success of it. We have to have a man there who can detect the very least degree of difference in the clay as it comes down the hopper. As the clay is not always put in the sheds at the same time, is sometimes from different localities and sometimes different strata of clay, and they are not thoroughly mixed and come in in different shapes, it is the duty of the man back of the pug mill to see that the clay comes out in good shape. The man I have is very thorough in that respect, and we have very little trouble. I have hardly any losses, but the man does his work thoroughly, and I do not think very many of the men grumble at his work, because they know they cannot take his place, and it would not do any good for them to do any kicking.

President Gates: I would like to hear from Mr. B. W. Bennett, of Muncie.

Mr. B. W. Bennett: I was not expecting to be called upon, because I thought I was not known to any one but the Secretary. I manufacture brick by the soft-mud process, and I find that this particular place is the most difficult to fill in my brickyard. I think the position one of the essential ones. The man must have plenty of good judgment, and muscle, too. He must not always be thinking about how much money he is going to draw Saturday night. If you have a man who is interested in your work and you appeal to his judgment, you will find that he will be successful. It is necessary that he should always have plenty of clay at his command. If the carters are a little slow and the mill runs nearly dry before he gets his clay there, he cannot keep it up to a fine temper. You must back up the man behind the pug mill, and see that he always has the water convenient, so he can handle it at his convenience. It has its effect on the brick if the clay is a little stiff at one time and a little soft at another. I use the pallet system, and think stiff-molded brick cannot stand as much firing as soft-molded brick. I like to have my brick at a reasonable or medium temper—just stiff enough to stand up well. It is one of the most important parts of the business to have a practical man at the pug mill.

Mr. Adams: I would like to ask Mr. Bennett how he dries his brick.

Mr. Bennett: I dry with natural gas. If I have my brick tempered too stiff they will crack more readily than when made too soft.

Mr. Wm. Conway: I want to add my word in favor of the man behind the pug mill. I consider him the most important man on the brickyard. You can talk about machinery making brick, but the true secret of making brick is to give the machine the proper material with which to make the brick, and the only way to do that is to have the proper man behind the pug mill. Brick-machine men will tell you all about what their machine will do. Some claim they don't need any pug mill, and all that. I don't care whether the tempered brick is soft mud or stiff mud, you want plenty of pug mill and a good man behind it. Give the machine the mud in the proper shape and it will make brick; if you don't do it, the best machine in the country will not make satisfactory brick. The man behind the pug mill is the most important man in the brickyard.

Mr. Alfred Yates: It is an admitted fact that we want an experienced man back of the pug mill, but the time is coming when that will not be needed. Prof. Orton will tell you exactly how the clay should be tempered. He has a little vicat needle that he can introduce into the clay, and it is so sensitive that it can tell you exactly the consistency to which the clay should be tempered, and when these little instruments become generally used, then we will have something that will be exactly correct. Now, we put these men behind the

pug mill, and it is a very hard matter to find two men alike. You can take a bushel of wheat and find two kernels alike, but men differ in many respects. One man will get the clay too stiff and another will get it too soft. My greatest success has been obtained with a boy at the back of the pug mill. I make vitrified brick, and I have a boy tempering the clay. I know the softer you can handle the brick the stronger the bond. I hope that at some future time some of our machine manufacturers will come to the front with a first-class dummy that will need no instruction, that we can set up back of the pug mill, and that will temper the clay without any assistance from us or any worrying on our part.

Mr. Eudaly: I once had a first-class dummy for some time. (Laughter.) I do not altogether believe in dummies. It may be all right, but I look at this question with a little broader view. I think this question of thorough preparation of the clay for the brick machine a very important one, and to say that we can lay down and fix any rule for the proper preparation of the clay, with our present knowledge and experience in the clay business, is an impossible thing to do. The great variety of clays and the great variety of machines and the great demand for different kinds of brick, and all that sort of thing, have so much to do with the preparation of clay that I do not see how we are going to fix or establish any definite methods of doing this; but I believe that the clay should be properly prepared. Not long since I heard quite a discussion between two very prominent brick manufacturers. One took the ground that the clay ought not to be ground too fine; that there was such a thing as ruining the clay by over-preparing it, and the other declared that the reverse was true, that clay could not be too well prepared. Only yesterday I was introduced to one of the foremost architects in this country, and he made the assertion that he could not use hard brick, hard building brick, in large builings. Well, it startled me, and I questioned him, and he said that it was a well-established fact in the minds of a great many people that hard brick could not be used in large structures because the mortar would not stick well to it. Now, this is a foolish idea, but it shows how some of us are carried away with false ideas. Some men think that clay can be too thoroughly prepared. Why, there are some men here to-day who would try to demonstrate that. Let us study these questions pretty thoroughly and carefully before we make any statements. I like that paper very much and many of the discussions brought out by it. There is great importance attached to the proper preparation of the clay, and I am one of those who believe you could not get very many excellent brick if you did not have your clays thoroughly and properly prepared. Whether you will be able to do this automatically with a dummy or not I do not know.

Mr. E. M. Pike: This matter of hard brick and the idea that mortar will not stick to hard brick or a smooth surface is a fallacy. We know that; those of you who have any doubt about it take an enameled brick and try it, or take two pieces of glass and put mortar between them and let it set, and then try to pull them apart, and then you will see that mortar will stick to a hard surface and a smooth one, too.

Jno. Miller, Washington: It will not stick as well to hard-burned brick as it will to medium brick.

Mr. Plumb: Some time ago a large manufacturer sent to us for some samples of clay. We have a coal stratum at Streator, and in sinking the coal shaft we went through various kinds of clay. Several years ago a large pile of clay was thrown out and was weathered there for a number of years. This gentleman sent to Streator for some clay, and we sent this clay to him. They worked it in the manufacture of roofing tile, and he seemed to be delighted—thought it was just what he wanted—and we sent some of the raw material from the bank and he could not use it. Now, there was the thorough preparation for years and years by nature disintegrating the original stratum and preparing it. I do not believe you can overdo the matter of preparing clay, breaking up the natural condition in which it has laid in the bank, before sending it to the pug mill.

—Tempering Clay an Hundred Years.—

A. D. Keyser, Philadelphia, Pa.: Some years ago I met the manager of the Doulton works, in England, and talked on the subject of clay and preparing it. He said they never used clay that had had less than one hundred years' preparation. He said they had clay that had been prepared and worked over for a hundred years, and that they used it in the fine ware that they make. I met that gentleman in my own house. Of course, I am not competing in his line, and he had no reason to misinform me. He said he believed that some of the clay they worked was kept much longer than that. Speaking of mortar not sticking to hard-burned brick, I am now in my yard tearing down an old dryer building of Chambers brick, and they do not have to clean the brick at all; the mortar simply flies right off.

Mr. J. C. Adams: I do not want to take up the time of this Convention. I agree with what has been said in regard to the importance of tempering clay. To my mind, the most important man in the operation of a brickyard is the man behind the pug mill, the man who prepares the clay. A 75-cent boy would not do for me. With reference to the statement of our friend suggesting an automatic controller, such a condition might be brought about, providing the material was of a uniform texture. But in my place such an apparatus would not work, because the dummy would not know when there was a change in the material. I select my man, and then I hold him responsible. If the brick run too soft or too stiff, then he hears something drop, and I look to him as the main guy.

W. S. Purington, Galesburg, Ill.: There is one point in this question that I think we have overlooked, and that is we should have a steady pressure of water, so there will be no variation. We used to use tanks to supply the pug mill with water, and the result was that the tanks would not always be kept full and there was a variation in pressure. We are now using a pressure valve. In that way we can regulate the pressure of the water, and I think it is very essential. Another point which is always of a great deal of importance is to have a short hose at the pug mill, and we can sprinkle the clay if we see it is getting too dry as it enters the pug mill. Perhaps some of you are not using this. I agree with Mr. Adams that a 75-cent boy is not the proper thing. We

J. C. Adams, Indianapolis, Ind.

pay the highest wages to the man behind the pug mill, and it is an incentive for the men to work up to that position. In regard to the grinding clays too fine, I am only speaking from my own experience and our standpoint. Our shale can be ground too fine. It will not make as tough a brick as the brick made from particles which are coarser, I presume on the same principle that fine sand is not as good for cement as coarse sand.

President Gates: We have some questions on the programme for general discussion, and I hope the members will jump up and fight for the floor, and, to give all a chance to speak, I am going to enforce the five-minute rule on each speaker, regardless of whether he voted for me or not.

Secretary Randall: The first question is:

—"Do We Make the Best Use of Our Clay Banks?"—

President Gates: I do not believe any of us are doing that.

Mr. Carson: I saw this question in the published programme, and have committed my ideas on the subject to paper and submit them for your consideration.

This seems to me, gentlemen, a very peculiar question, in that it presents so many points of approach, having a multitude of faces, each of seemingly equal value as the nucleus of a discussion. The point selected I consider one of the most important because it is the general starting point of operations. This indicates that the clay bank should be the hub

of the plant. I say should be advisedly, because it is not always so, often being made subservient to our wishes. We wish to make paving bricks, as we have a market for them at good prices. We make our wish the hub in this case, and follow with a herculean endeavor to force everything else in line. Our clay may be the best in the world for common bricks or the ideal material for dry-pressed bricks, and, with a properly equipped plant on the above lines, could be made to pay handsomely without an exorbitant expenditure of vital energy, but that does not satisfy; we have set our minds to make paving bricks, and determine to push our hobby, even if it takes five years to find out that our material is not suitable for that variety. The usual result is one of two alternatives—we either abandon the bank and import the material necessary, or we abandon the site altogether, allowing somebody else to step in, make the proper use of the material, and, incidentally, make money where we dropped it.

This same song can be sung to many tunes and with variations. I have in mind the counterpart of the foregoing supposition. A certain company became possessed of a shale bank, and thought if they could make first-class pressed bricks (dry pressed) they could easily possess the market for that product. A first-rate plant was erected and manufacture begun. After struggling along for a couple of years, it was decided that the machinery was not just the thing, so other machines were put in, but without overcoming the difficulty. Another prolonged struggle followed, and then a shut-down. The last I heard of this plant it was making excellent paving bricks and money. Another variation is a yard that has made face bricks successfully for years, deciding to add a stiff-mud

J. W. Carson, Montezuma, Ind.

machine and make paving bricks, proving a failure, selling he outfit and going back to their old love—wiser, but somewhat poorer. Another variation is the terra cotta branch. The very name of terra cotta has a fascination for some men, but the fabulous prices supposed to be obtained have, perhaps, a greater drawing effect. It is generally pressed-brick concerns that are, in more senses than one, bitten by this head of the hydra. I have had letters myself from terra cotta makers, who "wish to establish a branch to your works; the outlay necessary is very trifling and the profit large, and would work in splendidly with your present product," etc. The question of suitability of material seems to be left out at the start, but at the finish it comes in like a tornado, often sweeping into oblivion the branch, and perhaps seriously imperiling the life of the parental tree.

I don't wish to be understood as opposing experimental work, but to be valuable it must be done systematically. It is really only by judicious experimenting that we can find out if we are making the best use of our clay bank, which means getting out all there is in it, both of glory and profit. The policy of expansion is just now a rather popular question politically, and most of the reasons given pro and con are relevant to the subject we have in hand. Expansion of either territory or business entails added responsibilities and liabilities, an increase of everything from staff to capital, a division of our mental and practical supervision, making it imperative that we consider whether our resources are adequate or not. If we are convinced that they are, and everything else is in order, then expand, but it should be done judiciously and gradually, providing not only for seen conditions, but possible contingencies. Don't split up your energy, but concentrate it principally on one point. Therein lies success.

If you wish to make the best possible use of your clay bank, make only that class of goods for which it is eminently suitable, and in making them use only the best of machinery and kilns. These, combined with good management, are almost certain to produce satisfaction, with all that word implies.

This brings us to the point of determining the suitability of our clay for any specified purpose and opens up a vista of plain sailing for the embryo brickmaker. I am not trying to spring anything on this Convention, nor do I claim the idea to be new, but I certainly do think that we have in the Ohio School of Ceramics the solution of the problem, "To which branch of clayworking is my material most suited?" which is, in other words, the question I am speaking to. We send a workable sample of our material—clay or shale—to the school. It is there practically tested by the most approved appliances and by men who are making clay the study of their lives, who have no axes to grind, therefore are not trammeled by any idea of personal gain. We in due time receive a report of test, presumably exhaustive, but certainly reliable and to the point, and which will save us hard work, worry and useless expenditure if we act on its recommendations; or, if not on the line we prefer, acknowledge the receipt, pay the bill and stay out of the business. As I have previously remarked, there are other approaches to this question, the consideration of which would carry us all over the plant, from the way we bring in the raw material and including every minute branch of manufacture, ending only when guarantees are fulfilled and we receipt the bill for bricks delivered; but I consider the view selected as the most important because every subsequent move depends for its success on the wisdom of our decision at this point, and the prosperity of the whole is in proportion as every part is in harmonious relation to every other part. The old saying, "You cannot make a silk purse out of a sow's ear," is pertinent to our question. (Applause.)

Secretary Randall: Question No. 2:

—"What Causes Stiff-Mud Brick to Blister? How May It Be Avoided?"—

Mr. J. W. Sibley: We are making our brick by the side-cut process, and we do not have any blisters, so it strikes me that one way to avoid blisters is to make side-cut brick. I understand the trouble occurs to a certain extent in end-cut brick, and I think it could be overcome by repressing.

M. E. Gregory, Corning, N. Y.: We are making brick by the side-cut process, and are still having trouble. I came here with the expectation of getting some information. In making red brick we have no trouble; in making buff brick we do.

Grant Dibert: We make stiff-mud brick, and we have used different dies, different makes of machines, and we find it lies a great deal with the different dies and their lubrication. The steam forms bubbles on the side of the brick, and I think the die is the place to look for that trouble.

Mr. Gregory: I have come to the conclusion that it was caused by the air in the stream of clay. I have found that by passing a roller filled with tacks or sharp steel pieces over the clay as it comes from the die it is less liable to show the blister.

Mr. Tiffany: When does the blister occur—in the green stage or after burning?

Mr. Gregory: Before it goes to the dryer.

C. C. Barr, Streator, Ill.: We have some little trouble of this kind if we do not give our machine all the clay it should have. If we allow our augers to get too badly worn we will get the blisters.

W. S. Purington: Mr. Barr said just about what I was going to say. In using end-cut brick for sidewalks we had a great deal of trouble with blisters, not when the brick were laid, but in later years. Mr. Sibley says that repressing will take that out. I am not so sure about that, though where the brick are indented, as in the case of our sidewalk brick, the trouble is obviated. No blisters will show after the brick have been stamped.

Mr. Yates: I experienced some difficulty in this line. I used lubricating oil and steam, and as soon as I have applied the oil—I run the oil down into the die—the steam liquifies it very fine, and it decreases the friction. There is a certain friction that I think is responsible for it. By mixing the oil with the steam I have relieved that friction, and since then I have had no trouble.

Mr. Eudaly: I knew a man to overcome it by attaching a steel comb to the side of his die.

Mr. Keyser: I can hardly realize that this trouble was caused by anything in the machine. About two years ago we lost in the neighborhood of 20,000 hand-made pressed brick that blistered that same way some time during the summer.

They were made some time between May and August, by hand, and there was nothing in the machinery there to do it.

Secretary Randall: The next question, No. 3, reads:

—"Is There Any Advantage Gained by Using Warm Water for Tempering or Pugging Clay?"—

Mr. Pike: I say yes, for the reason that warm water will dissolve the particles of the clay.

Mr. Eudaly: Warm water aids in drying, because the brick are warm in the center before they go into the dryer.

Mr. Clapp: We have a very strong clay, that is troublesome to dry in the yard, and we found that by using hot water our brick will dry without cracking, while, by using cold water, they will crack all to pieces.

Grant Dibert: One of our fine brick manufacturers, Sankey Bros., find that they avoid the cracking of their brick in the dryer by using hot water.

Mr. Adams: By the soft-mud process there is danger of having hot water too hot. You will dry the sand off the mold and the brick will not slip from the mold.

Secretary Randall: The fourth question is:

—"Do Not Brick Sell at a Lower Value than Any Other Building Material?"—

Cries of "Yes."

President Gates: All in favor will say "Aye."

This met a hearty response.

Secretary Randall: This brings us to the last question:

—"Which Is the More Satisfactory on Common Yards, Day Work or Piece Work?"—

Several members: Piece work.

On motion the Convention adjourned.

THIRD SESSION.

Thursday Afternoon, Feb. 8.

The third session was called to order by First Vice President Geo. H. Clippert, at 2:45 p. m.

Vice President Clippert: I want to say that the mustard pláster of which our worthy President spoke last night has been applied, and it is getting hotter all the time. (Laughter.) We will proceed to business, and I will ask the Secretary to read the first order of business.

Secretary Randall: I want first to refer to these samples of brick here on the table. They are presented for our inspection by Mr. W. H. Hunt, the Cleveland representative of the Hydraulic Press Brick Company. They were procured by him some years ago in his travels abroad, and doubtless are good specimens of the brick of ancient times. One of them shows a delicate footprint that may be that of Cleopatra or the Queen of Sheba. Mr. Hunt is a very modest man, but I know he could tell us a very interesting story about these brick. He is a very able man, one of the brightest men in our Association—one of the silent members who have a reluctance to talk before an audience; but I hoped we might induce him to tell us something about these brick. Those of you who are interested in ancient history will do well to button-hole Mr. Hunt. The first regular number on the programme this afternoon is a paper entitled "Discipline and Courtesy in a Brickyard," by Mr. M. E. Gregory, Corning, N. Y.

DISCIPLINE AND COURTESY IN THE BRICKYARD.

By M. E. Gregory.

Mr. President and Gentlemen of the Convention:

Many manufacturers regard the subject of discipline and courtesy among their employes as a matter of secondary importance, while as a matter of fact it is one of the most important subjects to be considered, for more can be accomplished and better results can be gained in all departments when proper discipline is observed.

To be able to apply this to the average clay manufacturing plant, where men of all grades and different nationalities are employed, it is not an easy task. However, it is not the accomplishment of an easy task that makes a man successful.

In order to get the best results I believe we should be very careful in organizing our business, putting none in positions of authority and trust unless wholly worthy and competent, and laying aside all friendship and relationship, as many a man's business is blocked by his own relatives and social friends, who are the first to desert him in time of adversity.

I believe employers should impress upon their employes the fact that their interests are parallel, and that success to the employer means more work and better wages for the man employed.

It is quite impossible to call all men in for consultation, but foremen and men in positions of trust should be called in the office for consultation occasionally, at which time the general progress of the business should be considered.

It would be in keeping at this time to take up and consider the mistakes since last meeting, and how the same could have been avoided. Then it is well to consider suggestions for the general welfare of the business. These discussions, if properly handled, will bring out many new and valuable ideas, as most intelligent workmen are thoughtful. Besides, it tends to destroy the feeling of jealousy so prevalent among workmen, and supplant it by interest and zeal for the welfare and success of the business. If this theme is pursued the same spirit will soon prevail among the men, who, in turn, will be better and more loyal.

Each foreman should be required to report the daily cost of production in his department, which should be so classified as to be easily compared with previous reports and records. If the report shows additional cost the same should be carefully investigated and sufficient reasons obtained. If this cannot be done it is evident there is mismanagement.

In some cases it is advisable and profitable to offer a cash premium, basing the payment of same conditionally upon the output of the department. For instance, if one knows the per cent. of brick obtained from each kiln for a certain period, and the cost of fuel, offer the burner a cash premium to increase the percentage of good brick and decrease the fuel bill; and you will be surprised at the result and the interest the burners will take, and the result will be more than gratifying.

I believe a record should be kept with all employes, especially those in positions of trust where a memoranda is made, as a credit for all good suggestions, acts of loyalty, etc., whereby the

M. E. Gregory, Corning N. Y.

business is benefited, and a like record kept as a debt for all errors, mistakes, etc. If the debt becomes too great the party should be called in to account. If, on the other hand, increase of wages is granted it should be made as the reward of merit, or vice versa. If this theme is strictly adhered to the men will soon learn that they will only advance as they are worthy, and will apply themselves more carefully and soon become better and more efficient.

What to do with the intemperate man is an important subject, as there are always some in this class who are very valuable to the business.

The day laborer who gets drunk every pay day, or as often as he can get trusted, is a constant annoyance, and the sooner one is rid of him the better; but the more intelligent generally have ambitions, and can be reached if approached in the right spirit. These men should be helped and encouraged. This can be done by raising their wages continually and payable at a distant date, provided they do not drink during the period promised. I tried this myself last year, and was more than gratified with the result. For this I selected two intelligent men who had caused considerable trouble from this source. One won, and has not touched liquor since, while the other lost, yet asks for another trial, and states that he has not drank since.

It has been said, "If one is to receive courtesies they should show themselves courteous." This will apply equally as well in a brickyard as any other place.

Employers should treat all employes courteously and require all foremen to do the same, as many a laboring man's day's work has been made lighter by a pleasant greeting from his employer. If this is observed the men will soon learn to appreciate the same, and the result will be that they will respect their employer and work for his interest, while if they are treated coldly they will work mechanically, and the result will be far different.

I believe all orders should be given to the men pleasantly but

firmly, and if violated more stringent means should be resorted to, as all employes should obey orders to the letter without talk or comment. If this is always done an employer is able to map out his work in advance, which is quite necessary at all times.

I believe if the laboring men are treated fairly and their troubles considered justly we need have no fear of labor agitations, which often harm the men themselves as much as their employers. (Applause.)

—Brickyard Courtesy—General Discussion.—

Vice President Clippert: I am going to ask Mr. Townsend, Sr., of Zanesville, to lead in the discussion of this paper.

Mr. Townsend: I have been an employer of labor on a brickyard for many years, and I have always found it profitable to be courteous to my men. Our works are divided into several departments, and we have a general boss and several sub-bosses. The sub-bosses have the power to discharge men who do not do their duty, and also the power to hire them. The discipline on my yard is very good. I have some men who have been with me thirty years, and I guess I have thirty men who have been with me twenty years. We work all kinds of men—white, black and red—and I never go on the yard but what I speak to my men courteously and pleasantly, and my men have always been satisfied. With all the strikes, my men have been satisfied and never wanted to join the unions. I pay my men according to merit. I pay some men more for doing the same thing than I do others. I think it pays well to treat your men as though they were your equal, as long as they behave themselves. Drunken men I have no

J. Parker Fiske, Boston, Mass.

use for, and get rid of them as soon as possible. A foreman that gets drunk while in my employ leaves forever, no matter what the cost to me. I am also a large contractor, and I treat all the men in my employ the same. It puts money in our pockets to be kind to our men; treat them with firmness, and then they obey you. If they don't, then discharge them on the spot. I have in my employ forty or fifty colored men and one or two Indians. I employ all kinds of men that will do the work. Our brick works have been run successfully in the city of Zanesville for thirty or forty years.

Vice President Clippert: I guess you wouldn't object to your men going to a smoker. (Laughter.)

J. Parker Fiske, Boston, Mass.: The question of discipline on a brickyard is one of vital importance, as the essayist has said. You all know what an important part discipline plays in the Armies. You know what splendid success has been achieved by the disciplinarians in all our great wars. We know what discipline is in the Navy. Of course, it goes without saying that there must be something more than mere discipline. There was discipline among the slaves in Rome. There has been similar discipline in many instances since that time, and the efficient work has not been produced such as is produced by the man to-day. We must have something more than mere discipline. The employes must be in sympathy with their employers. I believe the great organizers of the world have been those who have been able to interest the people and to organize them in such a way as to make them love their organizer. Now, the most successful manufacturer, as a rule, is the man who has not only the respect, but the love of his workmen. I believe we should aim to get our workmen in sympathy with us. Take a kindly interest in them, and then labor troubles will not be so prevalent. There often comes a clash between the employer and employe; it often becomes necessary for the employer to reduce wages or increase hours. Now, how shall he do it without exciting the enmity of the employes? I believe it can be done in the right way, without lessening the respect and confidence and sympathy of the men. Show a more kindly interest in the men; be interested not only in the amount of work they do during the day, but be interested in their everyday life. An interest in his family will go a long ways toward offsetting many of the hardships of labor, such as the reduction of wages and increase of hours. I had hoped we should have here at the Convention a gentleman who has been making an experiment in his factory of the premium system of paying labor. I believe we discussed this morning the question of piecework. One thing, however, is certain: we must have discipline, we must have courtesy and we must have sympathy, but more important than the two latter is discipline, for without discipline the yard will soon go to pieces.

D. V. Purington: One phase of this paper, one particular phase of courtesy, that has not been touched upon, is sometimes rather an important thing in properly conducting either a large or small business. It is not only courtesy to the man, to the employe, that I refer to, but the general courtesy that should prevail in the whole establishment. I was thinking, while Mr. Fiske was speaking, of a little incident that occurred some years ago, and, while it may seem a little egotistical, I am going to tell it. A friend and I were riding through a section of Illinois, and we had no knowledge of any brickyard within twenty miles. As we rode up on top of a hill and looked down we saw there, in the little valley below, a large and apparently successful brick plant. We headed our horses that way and rode down to the factory. We hitched our horses, and as we went into the office door a man came out, and I asked him if he was the proprietor. He said he was the superintendent. I said, "Can we go through the works?" He said, "No, sir, you cannot." "We would like to do so very much," I said. "It don't make any difference if you would. We never allow visitors to go through our plant," he replied. I looked at him for a moment and I said, "May I ask your name?" He gave me his name, and I luckily remembered that about ten days before that he had visited our plant, and I said, "You were up at Galesburg last week?" "Yes, I was." "Did you go through the works?" I asked. "Oh, yes." I said, "Did they treat you with all the politeness that the occasion demanded?" "Oh, yes, they treated me very nicely." "Well," I said, "my name is Purington," and he said, "You can go all over these works." Now, he hadn't anything there that I hadn't seen before, and there was nothing there that he needed to have kept secret; but it was a lack of courtesy, almost a lack of decency, for him to take the position that he did when he said I could not go through the works. In our dealings, not alone with our men, but with everybody else, whether we are in the brick business or any other avocation in life, courtesy and politeness are as essential to success as almost any other thing that I know of. I simply wanted to make these remarks as another phase of the courtesy question, as the question seemed to be going entirely upon the feature of treatment of our men. Success demands that we should be polite and courteous to every man. (Applause.)

D. C. Cawley, Allegheny: The gentleman from Boston seemed to think that to offset the reduced wages or increased hours we should be courteous to our men. I would like to have brought out why it is necessary to reduce wages or increase hours? If all men in certain localities paid men the same and gave them the same hours, what would be the necessity of any single one endeavoring to reduce wages or increase hours? I only speak of this because the gentleman from Boston appeared to put particular emphasis on this part of his speech. I do not see any reason for this whatever. If they will stand together, they can all afford to pay the same wages and keep the same hours, and then they would not have any occasion for strikes. If any single one wants to break away and get ahead of his neighbor by trying to cut down his men, others will follow in a short while, and then there will be trouble. I have never seen any reason for doing that. In our part of the country we think it best to pay our men well and not put too much work on them. Of course, there are some cases where the work is a little more difficult on one yard than on another, but you will generally find the men willing to concede a little bit, and then you want to treat them fairly and treat them alike, and you will hardly ever have a strike. We have not had a strike for thirteen years around the yards in Pittsburg.

D. V. Purington: I will guarantee that if you will bring those men to Chicago and start a brickyard, those men will all belong to a union and have a strike in fifteen minutes. (Laughter.)

Mr. Eudaly: We all know very well that it comes natural for some people to be extremely polite and courteous. But we know it is necessary to be polite and courteous in business; if it does not come natural to us, we must cultivate the habit. We are made just that way. I think one of the greatest elements in a truly courteous man, whether it comes to him naturally or whether it be acquired, is honesty. A man, to be courteous to his men or to his customers, must be honest with them. I do not mean in the common acceptation of the term, of giving full value received, but honest in the effort we make in their presence, straightforward, plain honesty, no deception whatever. Do you know that a man will strive to do everything he can for you if he has learned that your judgment is right and that your convictions and expressions are always honest and straightforward? I do not mean to insinuate in any way that any one is not honest. But if there is a class of men who look upon you with suspicion, it is the man who is working for you. He always sees what you see, for it is a matter about which he is concerned. A child will discover any deception in a grown person almost instantly. They seem to just read it in the faces.. Now I have had a little experience, and I have worked a great many men. I began working men when I was fifteen years old. I was one of those fellows who had to work very hard for a living, and I tell you straightforward, honest words will carry conviction. It does not do any harm to the man who is working for you to know that you are striving to make a million brick by a certain day. If he has confidence in you he is going to help you. I think you will all bear me out in this statement, that when we are frank with our men, interest ourselves in their affairs, that they will interest themselves in our affairs. If the man who owns the brick plant is courteous the men who work for him will soon acquire that courteousness, too, and there will be a genial atmosphere about the plant. There may come along a lot of men from a rough and tumble district and you employ them, and there being an atmosphere of courteousness about the yard they will acquire it. If they don't, and you have that kind of discipline about the yard that you should have, the other men will make it uncomfortable for them, the atmosphere will not be congenial and they will soon leave. (Applause.)

Vice President Clippert: I have just been informed Mr. Eudaly never had any children of his own, and so he knows all about them. (Laughter.)

Mr. Eudaly: I want to say that when you speak about children (laughter)—of course, any subject that the President announces we are at perfect liberty to discuss—if there is anything I like to do in the world, it is to talk about other people's children. I have heard it said that the man who could give the best advice about raising children is the man who never had any of his own. I do not believe the men who can give the best advice are the men who are not making brick. Let me tell you, if you want to see a valley, don't climb down into it, but look at it from the hilltop. (Applause.)

Vice President Clippert: The Secretary will now announce the next on the programme.

Secretary Randall: The next subject on the programme is "Setting Brick in Kiln or Kiln Drafts," or the effect of setting brick in kiln. We expected a paper on this subject by Warren Ittner, and it would have been a good one had he been able to prepare it. When Warren first consented to prepare the paper, he thought he would be able to complete it and present it in person. I am sorry, for various reasons, that he is not able to be with us. However, he has a very good substitute who will open this subject with a short talk, Mr. S. H. Alsip, of Bellville, Ill.

—Setting Brick, etc.—General Discussion.—

S. H. Alsip: The subject of setting brick in kiln or kiln draft is a very important factor in the successful burning of brick, for unless the brick are properly set, no matter what style kiln is used, or how much care and pains is taken in the burning, it is impossible to produce satisfactory results.

Common, ordinary brick does not require much judgment in the setting, except where the construction of kiln is such that it will not give a uniform draft. In this case, these defects must be remedied in the setting, and the only way to overcome these difficulties is to set the brick more loose in that part of the kiln where the draft is backward and sluggish, but wherever the draft is too strong the brick should be set more closely, in order to equalize the draft all over the kiln.

With ornamental brick, great care must be exercised in the setting, owing to the various shapes and sizes, for, unless due precaution is taken to keep the area of the flue spaces around the ornamental brick in proportion to the amount of space they occupy in the kiln, the draft will not be uniform, and the results are an uneven burn.

How close the brick should be set depends somewhat on the nature of the clay or shale the brick are made of, and the condition they are in when set in the kiln. Brick that are bone dry can be set closer than those that contain more or less moisture, and still produce equally as good results.

How much draft a kiln should have, no set rule can be laid down. Generally in watersmoking the kiln should be given all the draft that can be obtained, for the reason that as fast as the water is evaporated from the brick it ought to be carried off, and this can only be accomplished by having a strong draft. The only way to determine what draft is needed to properly burn the ware is to take observation of the quality of the brick after kiln is burned.

Should the brick set in the top of a down draft kiln be overburned, and the brick set in the bottom of the kiln be underburned, it indicates that the kiln did not have sufficient draft. On the other hand, if the brick set in the top of a down draft kiln is underburned, it indicates that either the draft was too strong or not enough heat was produced.

I did not prepare any paper on this subject, but have merely said a few words to open the discussion, so I will now make way for others.

Vice President Clippert: We should like to hear from Mr. D. M. Potter on this subject.

D. M. Potter, Springfield, Mass.: The only excuse I can see for calling upon me is, as Brother Eudaly has said, the less you know about anything, the more readily you can talk upon the subject. I know nothing about down draft kilns. We always make the draft go up. Put the draft at the bottom and the heat rises. We always set our brick near enough together so that one will impart a little heat to the other. That is like we are in the Brickmakers' Conventions, when we get close together we begin to warm up, and then we get good

S. H. Alsip, Belleville, Ill.

discussions. As for giving old brickmakers pointers about setting brick in the kiln, it would be out of the question at the present time. It always struck me as remakably strange that we should have an occasional good burn, and, at other times, a poor burn. It always appeared to me that we should find out just what we should have done with our poor kilns that we might get more uniform results. What we want to do, when we open the kiln, is to sell the brick from the bottom to top. We do not like the swelled brick, the pale brick and other kind of brick. It seems to me it is a matter that each man should take up and experiment with. I would like to find a kiln that we could set even throughout, and, until we do find a kiln of that sort, I will not call it a perfect kiln.

Robert Twells, Wickliffe, Ohio: I think that a dry pressed brick should have more draft than a paving brick. As Mr. Alsip has said, you suit the setting of your brick to the kiln.

Mr. Adams: A perfect kiln is a kiln yet to be found. In setting brick, brickmakers should be governed largely by conditions, the character of material to be burned, and the amount of heat it will stand, and the draft. Some kilns in some localities draw different from others, whether it is the atmosphere or the position, I do not know. If the draft is sluggish I set more open, if the condition is reversed I set them closer. I am reminded of an incident that happened way back in 1842, when a man was running against that polished and educated gentleman, James K. Polk. During the campaign they had a debate on the subject of tariff. Polk opened the debate, setting forth the position of the Democratic party on the tariff, which was one of free trade, and he

made a very fine argument. His opponent was an uncut diamond, a rough visaged man from the mountains of eastern Tennessee by the name of Jones. He got up to answer Mr. Polk, and he said he had not given the tariff very much study, but if he had had anything to do with the tariff, he would favor an adoption of a measure that would be suitable to all conditions. For instance, if the tariff was too high, he would lower it, and if it was too low he would raise it. (Laughter.) That is the way I set my brick.

Vice President Clippert: I see Mr. Tiffany in the rear of the hall. We would like to hear from him.

Mr. Tiffany: Really, I could not tell whether you were discussing setting brick in down draft or up draft kilns.

Vice President Clippert: It is any kind of a kiln.

Mr. Tiffany: The matter would be entirely different. Certainly you would not set the same way in a down draft as in an up draft kiln. You have to have more openings in your brick in a down draft. There is one point in regard to the setting of a paving brick in a down draft kiln, and I have never heard it mentioned in Convention. That is, in regard to the bags and flash walls. I have found that it was not entirely necessary to have flash walls in burning vitrified paving brick. Now I do not know that I can give you any information on this subject. Mr. Purington has had ten times the experience I have had in this. I have only studied it from a scientific standpoint, and have learned all I know from others in the business.

Mr. Pike: I have just come in and see this is headed, "Setting Brick in Kiln." Did I understand Mr. Tiffany to say it was not necessary to have bag walls in down draft kilns?

HERVEY HAIGH, Catskill, N. Y.

Mr. Tiffany: I think it is necessary, unless you are burning vitrified brick. If you want to protect your wares from the draft you have got to have bag walls, but if your ware is of such a character that you do not have to protect it, then you can economize and do away with the bag walls.

Vice President Clippert: We will proceed with the programme, which the Secretary will announce.

Secretary Randall: I have been requested to shift the programme to enable our President, who is absent on account of a pressing business engagement, to take part in the discussion of the report of the Committee on Trade Relations, and if it meets with the approval of the Convention, we will take up No. 13, "Drying Brick with Heat from Cooling Kilns." We were to have a paper on this subject by Mr. Robert Nesch, of Pittsburg, Kansas. Mr. Nesch promised to be here and read his paper, but they had an explosion, or some such accident, at his works recently, and he has been detained at home. W. S. Purington was to come prepared to lead in the discussion of this subject, but he is not present just now. There are two or three other gentlemen here, however, who can give us some information in regard to this subject. Mr. Hervey Haigh, of Catskill, N. Y., is using that system, and can tell us how he is succeeding with it.

DRYING BRICK WITH HEAT FROM COOLING KILN.

Mr. Chairman and Gentlemen of the Convention:

When I was asked to say a few words on this question of drying brick with heat from cooling kilns, which has just been given to you by Mr. Nesch, it occurred to me that to give you a little of our experience with this method for the last two seasons would be carrying out the wishes of all who have the advancement of our Association at heart. There is such a difference in material that enters into the art of clayworking that what would be a good thing for one might be the reverse for another, and yet I a steady and most uniform degree of heat can be kept in this way. We have a twenty-four-track dryer, that has 80,000 feet do not see why any clay that it is possible to dry at all should not be dried with hot air from cooling kilns, for the reason that of one-inch piping. We kept a steam pressure of seventy pounds per square inch on these pipes, and this registered, at one end, on an average, 210, and at the other 190 degrees of heat. We could not get brick dried fast enough (which, of course, is not uncommon), and we tried everything that we could think of, as well as the recommendations from others, amongst which was the regulating of our stacks, of which our dryer had over two hundred. Some said to close the last row altogether, which seems a common-sense idea, as the brick at that end were then dry. We closed and partly closed, changing each to its fraction of an inch, in proportion to its location to dry brick, but, do as we would, some would pull up and some would pull down; so we decided to put the stacks at the end of the dryer. We knew then that cold air could not be drawn down by some, and the hot, moist air out by others, and we found an improvement in this way; but still we did not get the results we wanted, and what we were told our dryer should do.

The cost of fuel with us is quite an item in the manufacture of our brick, and, having heard of others using hot air from kilns, we instituted inquiries, and went to see them at different points, and found that it was in successful use, and decided to adopt it. We purchased the necessary blowers and built flues from the kilns to blower and from blower to dryer. When purchasing blowers, we were told that it would require three of cold air to one of hot air, and so built our flues accordingly. Our dryer tunnels were fireproof, except the doors and decks of the brick cars. We were informed that wood would burn at 410 degrees; this we did not question, but kept at a reasonably safe distance by putting our heat into the dryer at 300 degrees. We found, however, that instead of requiring three of cold air to one of hot, it came very near to theopposite of th is, and, if the kilns are worked properly, no cold air need be put into flues direct except what comes through the kilns, though it is advisable, I think, to have one opening, so that in case your man, in putting on a kiln at night, gets too much heat it can be regulated quickly, which we find to our advantage at these times. We also find that ten Eudaly kilns, kept going, and holding 140,000 paving brick each, will supply 300 degrees of heat every day we are running. We dry from 110,000 to 120,000 brick per day, this being our burning capacity in our Eudaly kilns and our continuous (in which, I might say of the latter, we have a successful one), and we still have heat for more if we could use it. In other words, if the dryer had ten more tracks we could supply it with heat. We have also found that 200 degrees will dry this amount of brick, but, in order to cool our kilns more quickly, we keep it up to 300 to get rid of it. In this way we save almost one day in cooling off the kilns. If, in case our kilns are not filled regularly, which may happen with a break in our machinery, we simply hook on to a burning kiln. When this is done, care is exercised not to have the blower pull out more heat than our stacks would or our fires are making. We found, when doing this for the first time, that we had a false settle (it may not be the case with all materials), and the bottom of this kiln was soft. This can be remedied by keeping up the heat and allowing for this false settle.

In regard to the size of flues, blowers, connections at kilns, and whether the heat should be taken from the top of the kilns or the bottom, these all vary according to their location and the number of brick you want to dry per day, and which you can find out if you will only take the trouble to go and see them at work at other places, and by doing this you can then improve on yours, from the experience of others, which we did in not having our flues into dryer clear at the end, like some, and by having the shaft of our blower long enough so that the bearings are both outside of the heat going into dryers. So far we have nothing but words of praise for this system of drying.

If you would get rid of the difficulties of bursted pipes, tunnels laid off on account of a leak in some one of the unions, the excuses from your night boiler fireman why steam was not kept up, your hot-water pump stopped, and the excuses from your repair man that he could not find a valve and a coupling suitable to remedy the difficulty he was working at, then I would advise you to utilize the heat from cooling kilns; and if you want a larger per cent. of bone-dried brick, and have what has proved to us the cheapest and most effective drying system we have yet seen, and one that it is a pleasure for any firm to own and operate, I would advise you again to utilize the heat from your cooling kilns.

I thank you, gentlemen, for your attention. (Applause.)

—Drying Brick, etc.—General Discussion.—

Mr. Haigh: Before there is any discussion I want to say you will notice that I did not give the exact saving realized from using this system, for the reason that our fuel is considerably higher than it is at other places, so that others might not derive the advantage that we do. I can tell you, gentlemen, that we realize a saving of $38.00 a day.

Grant Dibert: Could you use the heat from an up draft

kiln in a dryer? As I understand it you have been talking about down draft.

Mr. Haigh: I was simply giving the experience we have had with down draft kilns. I would not like to say what you can do with an up draft kiln, because I do not know.

Mr. Pike: I wonder if all kinds of clay would stand this method of drying.

Mr. Haigh: I think I mentioned that in the first part of the paper, when we started our boilers, we registered the amount of steam kept on the dryer. I kept it myself, so as to know when the steam went up and down. Now it is easier to hold 300 degrees in the dryer of this hot air than it was with the steam. We can get 140 to 300 degrees so easily that I feel very enthusiastic on this drying with waste heat.

George E. Derry, LaPrairie, Canada: This system of taking the heat from a cooling chamber and putting it into a green chamber works all right, and it is much better for the brick as regards color, because the evaporation passing from one chamber to another, necessitates more back firing than if it was not used and I do not see that there is any great saving in regard to fuel in an up draft, but I should judge in a Eudaly kiln, or any ordinary down draft kiln, there would be a great saving. We have used this system at LaPrairie and we find it a great benefit. The brick come out a better color and more satisfactory.

Robert Twells: This is an extremely important question to discuss. I have a theory that it is not right to pull heat right through a kiln and I think it should be taken from the top of the kiln, not only for the good of the ware, but because heat naturally rises to the top, and I believe bye and bye all of the heat will be taken from the top of the kiln.

D. V. Purington: I supposed my brother, Will, who is manager of our works at Galesburg, was going to be here and take up the discussion of this subject. He spent some three weeks last fall investigating this subject—in fact, he has been investigating it for the last ten years, and if I had been in his place I would have spent lots of money experimenting. Among the other plants he visited was the one spoken of by Mr. Haigh, and it resulted in our making a contract, and we are now putting in the system of drying brick with waste heat from cooling kilns, not because of the kilns we are using, because the fuel we were using became so expensive that we found it necessary to change our entire system of drying. In this system we do not have to change our dryers. We are taking the waste heat from the top of the kiln, believing from what we can learn that this is the proper place from which to take it. We are making our flues to take the heat both from the kilns to the blower and from the blower to the dryer considerably larger than where it is already in use, on the ground that it is so easy to make the mistake of having them too small. And we have concluded that if we err at all it will be on the side of getting them large enough. We are putting on the top of our kilns a 72-inch flue. This is larger than any one would suppose it necessary. The kilns are 94 feet long by 21 feet inside, as near as I can remember. The Graves kiln from St. Louis is the one we are putting this on. We are going to put it on our Eudaly kilns too.

A Member: Do you dry your brick with hot air.

M. Purington: Yes, I have always been in favor of drying with hot air for the reason that you cannot take steam through the iron pipes and radiate without losing some of the heat.

Mr. Eudaly: This is a subject to which I have given a great deal of attention. In a brief way, I will state, if you will take your brick as you put them in the dryer and weigh several of them every day or twice a day for a week or so, and then mark these brick and have them dried thoroughly, and weigh them when dry so as to get a fair average of the amount of moisture you want to extract from your brick in the dryer, you can easily calculate the amount of air at a given temperature which is necessary to dry these brick and carry off this moisture. Now if your brick are inclined to crack in the dryer, and you know by the nature of your clay that you must have slow drying, then you should run the dryer at a lower temperature. At least you do not want the velocity of the air as great as when the clay will stand a great deal of heat. These things you have to know for yourself to some extent. If your clay is very apt to crack in drying you must allow the current of hot air to move very slowly, and then, of course, you are longer in drying. Now loading the air with moisture is another question. You cannot load the air with all the moisture it will take. It is natural, in drying brick with rapidity, that you will want to load the atmosphere with a full load of moisture. But the velocity of the atmosphere must necessarily vary from time to time; therefore, you cannot always gauge the volume or velocity to a nicety, so it becomes necessary to do what Mr. Purington says he has done, make the tunnel or conduit for carrying the hot air larger than it really needs to be. I believe you want to make it from one-third to one-half larger than the theoretical size. You will not be able to bring this calculation down to the real nicety that you would if you were in a laboratory. Now the blower takes up considerable space in the conduit or tunnel. You want to be very careful when you put a plant in to allow ample space, for you want to be sure that you are carrying a sufficient supply of atmosphere through your drying tunnels. Always force your drying tunnels all your materials will allow. Now, a word in regard to taking the atmosphere from the top or bottom of the kiln. In burning a down draft kiln my preference would be to take it from the bottom of the kiln. You can connect your conduit to the bottom the kiln by building it of brick, underneath the ground and entirely out of the way, for the resason that it is cheaper and better. Of course, your land must be dry. It has been said that taking the atmosphere from the top of the kiln seems to be the natural way, because air wants to rise. Well, so it may seem, but in a down-draft kiln we call a halt on this supposed-to-be nature and go the other way. We are not afraid to burn our brick against what some call nature. We force the air down, and why should we do not force it down, when we are taking it out for drying. There is no real good reason why we should take heat from the top of the kiln. It is said that by taking the heat from the top of the kiln there is not so much danger of injuring the brick by the cold air rushing in. I cannot see why the brick from the top of the kiln should be injured any more than those at the bottom. If you take it out at the top of the kiln the air must be supplied at the bottom and you may injure the brick at the bottom, and so if you take the air out at the bottom, why the vacuum must be supplied at the top. My

W. A. EUDALY, Cincinnati, Ohio.

opinion is that the proper, cheapest and easiest way, in a large majority of plants, is to take the heat out at the bottom of a down draft kiln. I hope I am not misunderstood. I am not stating this for argument's sake, but because I do not believe, so far as the cooling brick are concerned, it makes any difference where you take the heat out, and it is certainly more convenient to take it out at the bottom.

Mr. Purington: The reason we are going to take it out at the top is because it will cost us 75 per cent. less than it would to take it out at the bottom. The level of our kiln bottom is on a level with our yard.

Mr. Eudaly: Mr. Walters here wants to know whether, if the air is taken out at the bottom of the kiln, you would open the manholes at the crown of the kilns and let the air in. No, I would not. I would take the air out of the bottom of the kiln, if the land and everything was convenient. I would open, if necessary, my furnace doors, take the air in, just as if I was burning up through the kilns around the wall at the bags, and in that way carry it through. I would not open the top of the kilns and at once begin to draw out the air and cool off the bottom. If your kilns happen to be a long ways from your dryer, and your conduit is either overhead or underground, you will lose a great deal of heat. But if you are fairly close to your dryer, there is going to be enough heat to do a lot of drying.

Mr. Purington: There is just one little point that may mislead. You all understand that in taking the heat out of the down-draft kiln at extreme heat, it would be impossible to let it into anything in the shape of iron conduits. The plan is to let the cold air in just at the point where the hot air is taken into the conduit, that is, right where it is taken from the

kiln, introduce the cold air and decrease the temperature at that point. If you can cut off the draft of the kiln you will not draw as much hot air out as you draw cold air in. We let the cold air in, as I have said, right at the point where it enters into this conduit, exactly at the point where we let the hot air out of the kiln.

Mr. Eudaly: Mr. Purington, as I understand it, is taking his heat from the top of the kiln through iron pipes. That being the case, it becomes necessary for him to make his mixture of cold air at the burning kiln. You will readily see that with a kiln at a high temperature it would not do to turn the cold right into it. Now with the plan I prefer, and I believe Mr. Purington prefers, I would have this hot air go through a brick conduit under ground, and I would mix the cold air for reducing the temperature near the dryer and not near the kiln. I would keep the temperature of the brick conduit as near that of the kiln as possible. In that way the fan would have much less work to perform in conveying the air. But where you have an iron conduit, you cannot do this, because the iron conduit will not stand the heat.

Mr. Yates: This is a matter of economy and I am very deeply interested in it, but the cooling a vitrified kiln by allowing the cold air to enter upon the hot brick is a great risk. You are traveling too near the danger line, and while you are saving a dollar in economizing the heat from the kiln, you are losing at the expense of your ware, and I think waste heat can be utilized in a much better manner.

When you turn a volume of cold air into a kiln of vitrified ware I think you are taking greater chances of spoiling the brick at a chance of saving heat. Now, in regard to taking out

ALFRED YATES, Johnsonburg, Pa.

heat at the bottom of the kiln, I favor Brother Eudaly's plan, for the reason that there is no inlet of air at the bottom of the kiln. Heat rises, where you have an underground conduit, and if you take the air out at that point and mix it with cold air you would get it to the degree with less risk. If you have ever noticed when you open a kiln of vitrified brick, even after they have cooled off, the moment the cold air touches them you will hear a ring all through the kiln. When you want to send samples to an engineer, don't take those that have been cooled off too quick.

Mr. H. Haigh: I am very glad this question has come up. It is evident that Mr. Yates has not had much experience in this line. Now we do not let any cold air into the kiln at all. Our kiln when it is burning is sealed tight, the kiln is daubed, and the manholes are daubed and not taken off until we are ready to take the casing off. We do not take the hot air out of the kiln until it has stood for twenty-four hours. I am very glad this has come up because, from what Mr. Yates has said, one would think the cold air was let in on the brick but this is not the case. I want to say if any of you think we get checked brick from drying this way just come down to Catskill and we will let you see just what we have done. We have made 40,000,000 brick the last two seasons and I do not think we have as many checked brick as I used to get in Galesburg, where we did not pull the heat at all.

Mr. Derry: What replaces the hot air that is taken out of the kiln if no cold air is let in?

Mr. Eudaly: Remember, if the air is let in along the side, by the time it passes up and comes in contact with the crown it is heated.. You cannot get cold air into a cooling kiln. I mean when a kiln is hot. Of course, when the temperature is greatly reduced you may do so. You should draw the air in just the same as when you are firing. There is a great space over your brick, your crown is hot, and your walls are hot, and besides you are not required to rush cold air on your brick, besides you are not taking out the great quanity of air that some of you are inclined to think you are. No more than if you were cooling the kiln naturally. Of course, if you have a very small kiln, not more than 24 or 30 feet in diameter, and are trying to dry brick in a large dryer, it would be different, but with a large down draft kiln you are not taking any more heat out than would naturally leave the kiln in cooling.

Mr. Purington: If I understood Mr. Eudaly correctly, he is incorrect. There is no question about it. He claims that he would let this cold air in over the brick and up through the bags without injuring the brick, because it would be hot by the time it got up. It would take mighty little to crack the top course.

Mr. Eudaly: But you do not get the cold air to the brick.

Mr. Purington: I will give you an illustration and every one of you will bear me out. In cleaning off the grate bars of an ordinary down draft kiln of clinkers of our soft coal, it has happened more than a thousand times, that we would check two courses on top of every kiln. It is impossible for you to let even a small amount of cold air into a kiln without spoiling two courses on top. Some may think, from what Mr. Eudaly has said, you could open the doors. You can take a board twelve inches square, place it over one of the manholes and the minute air is introduced into the kiln that board will go eight or ten feet into the air.

Mr. Eudaly: What Mr. Purington says is true. Take a large kiln and open a manhole and force enough will be found to throw that board up into the air ten or twelve feet, without opening the door below. Now, I want to ask you where is the air coming from that takes the place of that volume of air which threw the board up? Where does it come from?

Mr. Purington: In a kiln that has been finished, the doors practically sealed up and left for twenty-four hours, and the man holes taken off, the results I have described will occur.

Mr. Eudaly: You must remember that, comparatively, but a very small amount of the hot air from the kiln is required to heat the dryer properly. Air will expand at 500 degrees about double, but, when you go beyond that temperature, the expansion is very slow. It will expand rapidly up to 500 degrees, but beyond that the increase of expansion is not so great in proportion to the temperature. The hot air you are taking out may be over 500 degrees, and but a very small proportion will be required.

Mr. Yates: I understand the object among paving brick men is to increase the quality. Now you are all very deeply interested in discussing the question that will lower the quality. The secret of success in burning is in keeping a regular temperature, either in tender clays or strong clays. Clay being a nonconductor of heat, the man don't live, in my opinion, in the clay business in this country, or in any other country, that ever started his kilns slow enough, or ever cooled his kilns slow enough, for the benefit of the quality of his goods, and if you want to make vitrified goods of a high quality, of the first grade, the slower you cool them, the better brick you will have.

Mr. George M. Fiske: Ten years ago I arranged a system of drying for my green terra cotta, by taking the heat from cooling kilns. The problem at that time was very simple. It took us five days to cool our kiln. During that five days the heat was passing away. Now, it is simply this, I can take that heat as it is passing away and utilize it in drying our green wares, and the method of taking it must be right, because if we cool that kiln off more rapjdly than the natural time that it should take we cross the danger line and mischief will follow.

Mr. Haigh: I want to add a few words before we close this discussion. Our kilns are not cooled any quicker now than they were naturally. This question of where the kilns get the air from, or whatever you call it (my education has been a little neglected, and I haven't the command of language that some of our brothers have), I am really unable to tell you. We get sufficient heat to dry our brick without any injury, whatever. After we have taken all the heat out that we can get out for our dryer, we cannot go in those kilns and take the brick out, not by any means; there is still heat left there.

Mr. Purington: How long do you take the hot air after you begin to use it? That is, how long do you keep a blower going on a kiln?

Mr. Haigh: Thirty-six hours. We do not begin to take the heat until after twenty-four hours, and do not begin to take the brick out until three days after that.

Mr. W. P. Blair: I want to ask a question of the gentleman who read the paper. If I understood right, the air he draws through the fans is heated to 300 degrees. Is that the case?

Mr. Haigh: Yes sir.

Mr. Blair: Then if you draw the air through the fans at 300 degrees, the air that comes from the kiln is no more than you would remove in cooling off that kiln in any other way you might adopt. If it were otherwise, it would take six months, perhaps, to cool off your kiln. The wonder to me is that he gets any heat out of the kiln, or ever gets a kiln cooled by his process; not that he takes so much hot air out, but that he takes so little that he would never get it cool.

Mr. Bloomfield: The question of the introduction of cold air is very simple. The brick that enter into the construction of a kiln will absorb water, and where water will go air will follow. Now it is impossible to create a vacuum. Hot air is going out through the stack and cold air is coming in to take its place. In the study of chemistry in the early days, in attemping to produce a vacuum, we found it was impossible to do so. And in the construction of a kiln, cold air is being gradually and imperceptibly introduced all the time.

Mr. Haigh: In regard to what Mr. Blair has said. I do not know whether any of you gentlemen know how much heat you have in your kiln. We know just exactly how much we have. We have 2180 degrees of heat when we are burning. We take 300 degrees, and where is the balance?

Mr. Parker: With 2180 degrees of hot air in the kiln, how many cubic feet of cold air will that heat to 300 degrees at the dryer. It seems to me that it is a very small quantity.

Mr. Yates: For Mr. Haigh's information, I will try to explain this matter. He says he does not know how the cold air gets in. The first thing is the expansion created by the temperature. If you take a volume of hot air out of your kiln you must replace it with cold air. I do not care how small the pressure, if it is only a pound to the inch. Have you studied how you create a draft in a chimney? You raise the tempera ture, expand the atmosphere and it goes up the chimney. You take so much hot air out of your kiln that you keep 15 2-3 pounds pressure to the square inch. It does not matter how small the pressure and the capacity of that inlet, it is large enough to take a full volume of air to replace the air you are taking out of the kiln, and if you have vitrified brick in that kiln it is to your interest to cool it as slowly as you possibly can. In my kilns we daub up the furnace doors, and do not open them until the kiln is cool enough to enter. It takes me from seven to eight and nine days to cool.

President Gates (speaking from the floor): There is one thing that occurs to me here, if anybody is willing to put a little money in it. There is one way in which you can tell exactly what is going on in your kiln without waiting until you open it. With it there need be no guess work. It is a little instrument called the La Chatelier pyrometer. Put into the kiln it will give you exactly what is going on in your kiln. I have found this of great use to me. It is very interesting in watching the cooling of the wares and the raising of the heat it will give you the condition of the kiln from the temperature outside to as far as you go. It works like a charm. It is an expensive machine, costing about $150, and you have to pay $60 for a little piece of wire. It is delicate and easy to get out of repair.

Vice President Clippert: We must pass this subject and I will ask the Secretary to announce the next number.

Secretary Randall: The gentleman who was to present the report of the Committee on Trade Relations is now present, so we will turn back to that part of the programme. Mr. Manson, the Chairman of the Committee, has been detained at home, but he sends the following report which I have been requested to read for him.

REPORT OF COMMITTEE ON TRADE RELATIONS.

Mr. President and Gentlemen of the Convention:

As chairman of the committee on trade relations, appointed at the last Convention, I beg to submit the following report: In taking up this work I found that everything had been provided except the sinews of war. Of course that was an oversight, but unfortunately it left me in much the same predicament that the old lady found herself who went out to dine, and, upon being seated at the table, found that she had left her teeth at home, I was obliged to tackle only that which offered the least resistance.

Part of the committee's work was to obtain "statistics and data for furthering the use of burned clay in building structures, and cause such data to be printed as extensively as possible."

The business to which for six years I have devoted my best energies has met in all its essentials the aims and purposes of these instructions, and as evidence of this fact I refer you to the files of The Brickbuilder, which may be found in the offices of most of the architects and many of the builders in this country, as well as in public libraries, builders' exchanges, etc.

Regarding the instructions "that this committee be empowered to represent this Association in all matters of public buildings, and shall work with the supervising architect, as well as others, in public authority, for the more extensive use of our wares in public buildings," and "that this committee shall investigate as to probable public buildings, and shall call to their aid any member of this Association whose aid may be required, and that all such members shall use all their efforts to assist by all means in their power," I would say that as a result of a visit to the department at Washington, and in conversation with several representatives who had introduced bills calling for appropriations for new government buildings, I became convinced that the wants of our Association would receive the same respectful attention that was given to all other individuals or associations who had propositions to present, and that such wants, if clearly stated, would be carefully placed on file.

I think that I established one fact as a result of my "lobbying," and that is that there isn't a single man in Congress who represents a constituency made up entrely of clayworkers.

I am glad to report, however, that as a result of investigation I find that brick and terra cotta are being used more extensively in government buildings than ever before, and this seems to be due not so much to special legislation or lobbying as to that old law of "survival of the fittest."

The interesting work done with brick and terra cotta by the former supervising architect, Mr. William Martin Aiken, has been a more potent factor in the greater use of these materials than the work of a dozen committees would be. In this connection I am glad to say that the present supervising architect, Mr. James Knox Taylor, is furnishing the country with some splendid examples of brick architecture, and with the feeling that example is better than precept, I am encouraged to believe that we shall see in our government buildings to be erected in the future a far more extensive and better use of burnt clay materials.

Regarding the further instructions given our committee relating to "the further extension of the popular movement for good roads," and that the Association be represented " in the matter of the inauguration of a cabinet department for manufacture and trade," I must plead guilty to neglect. But as this is the report of the chairman only, and as all members of the Association are members of the committee, it occurs to me that there may be an interesting minority report. Respectfully submitted,

FRANK C. MANSON.

A. C. OCHS, Springfield, Minn.

—How to Promote Brick Building—General Discussion.—

Mr. Bloomfield: I would like to say one word in reference to that report where he says there is not a Congressman in Washington, who has a clay constituency. In 1893 I was one of a committee who went to Washington for the purpose of heading off, if possible, an effort to reduce the tariff on fire brick. We had a representative from Middlesex by the name of Geissenhamer, his home was in New York, but he had a country seat in Middlesex. He said to me, Mr. Bloomfield, I haven't anything in my district that needs protection. The only thing that amounts to much of anything is the Singer Sewing Machine Co., and they export machines abroad, so they don't need protection. I want to say to you that the gross ignorance of that man in making that statement was beyond comprehension. In his district there were Henry Mauer Fire Proofing Works, the Perth Amboy Terra Cotta Co., the Staten Island Terra Cotta Lumber Co., and in addition to that there were thirty or more smaller concerns which needed protection, and I believe that the reason why our material is not better represented in public buildings is because of our own carelessness in not pushing it forward, and I think it is the duty of every man here to constitute himself a committee

of one, to induce his Congressman to have our material specified in plans for public buildings.

Mr. W. P. Blair: There is one little statement in that paper that interested me very much, in view of a little experience I had recently, and that is where the gentleman says "communications and requests respecting the use of clay material that are received by the supervising architect will be carefully placed on file." (Laughter.) We who have ever had any experience with the department at Washington know how carefully things are placed on file and are never looked at unless you look them up yourself. I have a letter, received only a few days ago from James K. Taylor, in answer to a request of mine that vitrified brick be specified for the foundation of a certain public building, instead of limestone. He acknowledged in the prelude of the letter the request for specifications for vitrified brick, and went on to say that he would not be able to specify brick of the manufacture of our company for the reason that the rules of his department forbade the specifying of any particular material to the exclusion of all others of like nature. I simply wrote back that his letter was not such that any intelligent man should address to another, and told him I did not ask him to specify the brick of my company's manufacture at all, and I repeated my request, asking that vitrified brick be specified, in order that we might get in competition with the fifty manufacturers of vitrified

FAWCETT PLUMB, Streator, Ill.

brick throughout the entire Union. I understand since then that the whole Indiana delegation has beset him on that subject and has told Mr. Taylor something that he knows very well; however that is, if he gives any consideration to a bid at all, it must be upon the material that is specified in the contract. He writes a nice letter, saying, that any contractor's bid upon material would be considered. He cannot consider and will never consider a proposition based upon any material that is not specified in the specification for the erection of the building, and it will not do to let Mr. Taylor off by saying that these requests and letters will be placed on file. Yo have got to go after him with a red hot poker. (Applause.)

Mr. Plumb: I want to say one thing in behalf of Mr. Taylor. I know in our State we are to have some public buildings built in the near future, and his attention has been called to vitrified brick, and I know he has sent to Illinois for samples and they are in Washington now. I think when he says he will take these matters and place them on file that he means they will be properly considered. I know he has sent for these samples of vitrified brick, that he might have the matter before him.

Secretary Randall: While Mr. Manson is not here, his partner, Mr. Rogers, is, and I am sure he can tell us something about this subject.

Arthur Rogers, Boston, Mass.: Mr. President, this is where Mr. Manson puts the mustard plaster on me. (Laughter.) I have not come here prepared to make a speech on this question. I think that part of the report which relates to the placing of your orders on file, does not refer to Mr. Taylor, but refers rather to the representatives. It seems to me that you want all the buildings built of brick too quickly. This thing is coming rather slowly and I think we should have patience. Mr. Taylor is supervising architect of the United States, and he gets communications from all the manufacturers of supplies in the country, the brick men, the stone men, and the cement men, the brass manufacturers, the iron men, and I can tell you that Mr. Taylor is a friend of burned clay, and he is using it wherever he can. If you could go to him and say, we are going to have a postoffice building and ask him to specify brick, and go to your Congressman and tell him you have 200 votes to go with your recommendation to get that brick, and then the granite man should go to him with 400 votes, why they will get granite. I believe the thing for the members of this Association to do is to make good brick and then get in touch with the architects of the country. They will not let you into their offices, perhaps, at 10 o'clock in the morning or 3 o'clock in the afternoon, to sit down and talk over the brick business with them, but I believe if you were to invite them to these Conventions, take the city of Detroit, where the architects are using brick, and using them splendidly. If you had invited the architects to come before this Convention and read a paper, I believe they would have done you as much good as brickmakers. (Applause.) One thing it would have accomplished. You, as manufacturers, would have been brought into closer touch with those who use your brick and that would have been a good thing for both of you. I think you could well afford to appoint a press committee to see that these papers get into the local press. If a paper were read before this Convention and printed in the Detroit Free Press or other Detroit papers, I am sure every architect in this city would read what some brother architect had said to the brickmakers. And the public would read it, and I think something of that sort ought to be done. Again I think you could well appoint a committee to act upon the suggestions that would be submitted by these architects. I know there are paving interests represented here, and I think that perhaps it would be just as well to have the engineers to come before the Convention and submit a paper on paving brick. It seems to me that in this way, in working and getting in closer touch with the market end of the industry, rather than saying to the Congressman or the supervising architect that you are not giving me the proper amount of attention, that you will accomplish the greatest amount of good. I had a letter the other day from a scholar of the University of Illinois, in which he said Prof. Ricker, before the architectural class there, said to the young men, "I would advise your studying closely the subject of burned clay, because in my opinion, the building material of the future is burned clay." Not having prepared any matter on this subject, I believe, Mr. President, this is about all I have to say. (Applause).

Mr. Gates: Mr. President, I would like to say a word or two. Mr. Rogers' modesty forbade him from saying one or two things which I shall say for him. The entire class under Prof. Ricker at Champaign study Mr. Rogers' paper and get their ideas for the use of material from that paper. There are some things that I would rather say in the absence of Mr. Rogers, but since he is here I will have to modify my remarks. I called Vice President Clippert to the chair and went out to attend to a little business on my own hook. I went up to an architect's office and ran onto a young fellow who is chockfull of business and has made the specification that I was to figure on. In going into this architect's office, I ran onto the young man back of the scenes, as it were, who was doing the most of the work. I had quite a little talk with this young man, and during our conversation he said to me: "Do you know where I could get a text-book showing me how to use brick and terra cotta? All that I have got is the Brickbuilder. I am really working this building right out from the Brickbuilder." And I could not tell him where he could get anything that would show him how to use my material except the Brickbuilder. Last year I went to work as the father of this resolution, and I wrote out every hard thing that I could think of for the chairman of this committee to do, and then did not provide anything to do it with. When I got through with this resolution I found that I had said so much that if I introduced the resolution the President would appoint me as the chairman of that committee, so I put it on to Manson. I did put in that one saving clause—that we should all be members of the committee. I got a little remorseful about that and did some work, and I tell you, gentlemen, that there is plenty of it for you and for me, and, no matter who we may put on that committee, he can do good service. The supervising architect is all right, and I believe he is doing his best to use your material and my material. We have a great big building in Chicago that is going to be put up some time, but before Purington or Wagner or myself could catch on to the project it was decided that that building would be constructed of granite from Maine, and if we had gone to our Congressmen and Senators and said, "Look here, there is to be a big building put

up in our city, and we believe in our goods, and we have a good many votes, and we want this material made where it is used. We want a part of the money that is to be spent on this building," now don't you think we would have got it instead of allowing somebody with a little pull in Washington to do a little quick work and head us off? I have the report of the supervising architect, and it just happens that there are a whole lot of buildings on which no work has been done, and they are buildings, understand, that are going up all over the country, and you gentlemen have your Congressmen, who have the whole say about this business. You want to go to your Congressman, or write to him, and say we are going to have a building in our section and we want the money spent right there. That is the most popular idea among politicians. Say to him, "I am building up a business right here at home, and employing men, and I want plenty of clay material to go into that building," and then, of course, you will have to compete with others. I have something here that I think will interest you. In looking over this list I find there are seven or eight million dollars' worth of brick ordered, and in some cases the contracts are let. We cannot follow these things too closely, because, necessarily, these reports go out and the other material men are not slow to take advantage of it. I have here a long list of government buildings that are to be erected in the near future. It is the popular thing just now. You know that some twelve or fifteen years ago there was a strong movement toward putting small government buildings in small towns, the idea being that the large towns had the large government buildings and the small towns were entitled to small ones, and it if had not been for a slump of some sort the thing would have gone through. It would make the people feel that they had some interest in the government. Now that there is plenty of money for such improvements they will be made, and we ought to see to it that our material has fair consideration.

I want to say, further, that I want to make the motion now to have Mr. Rogers continued on that committee, and, whether I am considered officious or not, and whether people say it is my business and I am simply trying to take care of it, I am going to keep on along this line. Of course, I am trying to take care of my business. If I did not believe I was making the best ware in the world I would have gone to pieces years and years ago. We believe in our business, and therefore have got to push it. I am going to write letters right straight along, and I am going to help him right along with this work, and wherever I see a chance to call on one of you I am going to do it. (Applause.)

Mr. W. P. Blair: I do not wish to be understood to be criticising the supervising architect of the Treasury Department when I said he pigeonholed these requests. Of course, as Mr. Rogers has said, he is having requests from everybody, but I believe there is no class of manufacturers in this entire country, from one end to the other, whose material is represented before the supervising architect, who advertise the good quality of their wares so little as do the brick manufacturers of this country. What we want to do is to keep at it and urge our Congressmen and Senators to see to it that we get a full share of it.

F. W. Meeker, New York city: I would like to say, in regard to Mr. Taylor, that I came in contact with him last year, and he gave me every courtesy in the world. I have several noted and large specifications calling for glazed brick. One was the Buffalo postoffice. We have a number of specifications for glazed brick and terra cotta, and we have specifications which call for 4,100,000 glazed brick in public buildings, and specifications for red front brick, not granite. I think brick is working out granite. I think it would be well for this committee to inquire as to the reason that the government has employed so much granite in the construction of its buildings. If we knew the reason we could argue against it. You will notice that most of the government buildings are constructed of granite.

Mr. Skeele: What has been said by one gentleman has impressed me, and that is the thought that we have no available literature that we can send out. I do not mean books, for we cannot mail them readily, but we should have concise, intelligible, lucid and efficient descriptions of what we have to offer, and put it in the form of tracts or pamphlets, and, wherever it is necessary, they could be furnished to us, and we could use them to the best advantage. I would suggest that that committee be authorized to compile such literature, and thereby we would have much more ammunition than some of us frequently have.

Mr. Geo. M. Fiske: I wish to indorse most heartily the suggestions made by Mr. Rogers. It seems to me that there is a way by which we can make a little progress, and that is the bringing of this Association in a little closer touch with the architects. They are the men to whom we are looking for the advancement of our material. I want to say that Mr. Rogers, as editor of the Brickbuilder, is doing more than any other one man in advancing the use of clay products in this country. It is his business, to be sure. He is not doing it for our sake. It is his legitimate business, but it is a business that is helping us exceedingly. This is not a put-up job between Mr. Rogers and myself as an advertising scheme, but I am stating my honest opinion. I think, if you would take that paper right along, and I believe every brickmaker ought to take that paper, you will see how much he is accomplishing. The editor is in closer touch with and has a wider acquaintance among the architects of this country than any other man. He is working this every day, and I think you will see it if you watch that paper.

Secretary Randall: Mr. Fiske is right. A leading architect of our city came into our office the other day, picked up the Brickbuilder and said: "There is the best architect's paper in the United States to-day, and I bar none. The work is first-class in every respect." There is no other architectural journal that compares with it. In and through it you have a friend at court, and it is going to bear good fruit.

Mr. Rogers: I do not know whether to apologize to you or to thank you. I am sure I thank you. Speaking about these public buildings, there is the new custom house at New York. Some one has said they hoped it would be of brick. It will not be of brick; it is going to be stone. People look upon stone as more dignified than brick. There is no question about it. Architects think there are certain buildings that

Geo. M. Fiske, Boston, Mass.

should be built of stone, and I think so myself. If we are going to have these smaller buildings in the cities throughout the country, you can depend on it these buildings will be built of brick; but you take the large buildings like the postoffice in this city, or New York, or Boston, or Chicago, and you may be sure that those buildings are going to be of stone, and I believe it is good for the brick business that we do have some stone buildings in this country—some few good ones.

Mr. J. C. Adams: This discussion and the remarks made in the last hour will become a matter of deep interest to the manufacturers of clay products, and I think it will result in good. The letter I received from Mr. Gates, a few days ago, in reference to taking steps in the direction of bringing this matter to the notice of those in authority is, I believe, worthy of attention at an early date, and if Mr. Gates will make a date to come to Indianapolis I will be only too glad, and more than pleased, to arrange a conference between him, or any other clayworker, and the Hon. Charles W. Fairbanks, a personal friend and near neighbor, who is chairman of the Committee on Public Buildings. And then you will be sure to have a fair show with the chairman of the Committee on Public Buildings.

Secretary Randall: This brings us to the question box. The first question for the afternoon is No. 14:

—"Is There Any Economy in Using Exhaust Steam for Drying?"—

A. D. Keyser: I will take up this question and the next one, "Is It Practical to Dry Soft-mud Brick in Less than Forty-eight Hours?" together, as in the system of drying I am using

now they both enter. The second question I can answer very readily. We are now drying brick in from twelve to fifteen hours. We have a dryer in which, about one hour after we start to make in the morning, we turn the exhaust steam on. We use the exhaust steam all day, until the machine gang is through. The dryer is then closed up and we use one-quarter of live steam. I would like to say that during the noon hour, when the engine is stopped, we give a little live steam so there will be no checking, but after the gang is done we give about a quarter of a turn of the valve, and keep on increasing that about every hour for about five hours, until we get the full head on. We keep that pressure on until 5 o'clock in the morning, when we close down, and the brick we set that day are done. We think it the most simple dryer. We formerly run a steam tunnel dryer. We make soft-mud Martin brick. We used iron pallets, with rack cars, and we have done entirely away with our cars and tracks, and our present dryer is really a system of racks. Our pipes are five wide and thirteen high. The five wide holds the pallet, and we just shove the pallet in lengthwise, just as though we were racking—shove them in on these five pipes and pile them up thirteen pallets high. It is entirely different from the car system, where you have to dry the whole car to get all the moisture out before you have a complete dry. As everybody knows, you would find in the center of the car wet brick, which we don't have now. The dryer was really an experiment. It was gotten up by a man who had a small plant. He got a large order late in the fall (in the neighborhood of 100,000 brick), and he got this system up, and we have the only other one in existence. It is a perfect success. We have made very

W. H. Hunt, Cleveland, Ohio.

little change in it. We built it 170 feet, but thought that a little too long, and we have changed it to 120 feet, with a capacity of 40,000 per day.

Mr. Adams: Does the exhaust steam go into the same pipes?

Mr. Keyser: The exhaust steam goes into the heater. We use exhaust through the four-inch pipes which lead into the dryer.

Mr. Adams: What kind of material have you?

Mr. Keyser: A very strong clay.

Mr. Adams: Now one more question. Do you take the brick from the machine to the drying racks on cars or trucks?

Mr. Keyser: The pipes are built the same as racks, and pallets bearing the brick are shoved on the pipes the same as on ordinary racks.

Mr. Purington: How many racks have you?

Mr. Keyser: They are ten pipes wide, and you shove the pallets in on both sides. Five pipes make the dryer. Two of these will dry 40,000 a day. We utilized the pipe out of the old dryer, and then we sold our old material as old iron for pretty nearly enough to buy the new. If we had kept it until now we could have more than paid for our dryer.

Mr. Yates: It was my pleasure to make an examination of a dryer plant which was run by exhaust steam, and I discovered that the secret of success was circulation. I would very much like to hear from Mr. Parker Fiske. I think his advice would be of great value.

J. Parker Fiske: I feel that I ought to be a listener on this subject, though I have had some little experience in drying with exhaust steam. It seems that this question is one of economy. It certainly is more economical to dry by exhaust steam than it is by live, especially if you are throwing away your exhaust steam from your engine. If, however, you have a condensing engine, which is now very common, there is no economy; but there can be no question, of course, that it is more economical than to throw away your exhaust steam. We were in the habit of drying by live steam. We had a dry floor. Now, this will not apply to soft-mud brick, but it may be of some use, relatively, to common-brick manufacturers. This dry floor consisted of some wooden racks, about two feet above the floor. On these racks we placed hand-made terra cotta and other hand-made shapes, in large and small pieces. There was a series of steam pipes placed beneath the racks, and it was expensive. It took a lot of steam, and we were a long ways from the engine. We could not use the exhaust steam because the pipes were not large enough and we did not have pressure enough. However, we made a change, letting the contract to a certain company. We changed from one and one-quarter to four-inch pipe from the dryer to the boiler room; we put in a hot well and a pump. The changes including the cost of the small building, the housing in of the apparatus, the addition of another radiator, the changing of pipes, etc., cost us about $1,200. The company guaranteed we should save $500 a year in coal and water—we buy our water from the city. I am pleased to say that we saved $500 and some four or five hundred extra. We saved in the neighborhood of $800 to a thousand dollars a year on an expenditure of $1,000 to $1,200. We do our drying fully as well if not better. There is no question but that it is better to use exhaust steam than to use the live steam, but we must be very careful not to put a back pressure on our engine.

Mr. Keyser: The most important thing about our dryer is we have done away with one boiler. We saved exactly 500 tons of coal last year, in comparison with the year before. We done entirely away with Sunday running. If there happens to be a break down the drier shuts down at that time, for we know that our brick will be dried during the time the machinery is running.

Mr. Townsend: We have an exhaust steam dryer, and seventeen tunnels 120 feet long and we dry 100,000 brick a day, common brick and paving brick. We dry the common brick in twenty-four hours, they go into the tunnel one day and into the kiln the next. They don't cost a cent a day when working. In the evening we have our watchman and engineer run the boiler all night. Of course, we have live steam for evening, so it looks to me it is quite an advantage to use exhaust steam. I am not going to argue any point, just tell you what we do. We use exhaust steam in the day time and live steam at night. The pressure on the boiler, I think, is about 100 pounds.

M. E. Gregory: I would like to ask a question. We use exhaust steam in the day and live steam at night. At the present time we are running a condenser. Which is the best way to return the condensation, by the trap or return it to the hot water well, or pump it into the boiler? If some one can give me this information, I will be very glad.

Mr. Townsend: With ours it runs into the well and we pump it back.

Mr. Gregory: Do you have a separator to separate the oil from the steam?

Mr. Townsend: I really don't know. I don't have anything to do with that part of it myself.

Mr. Gregory: An agent came to our place and he advised me to put in traps, but I don't want to take up with the first thing that comes along.

Mr. Eggers: I'm afraid you would get too much back pressure.

Mr. Keyser: We pump right back to the boiler. The water runs back by gravity into a small boiler and we have a little pump which pumps right back into the boiler.

J. Parker B. Fiske: The system I spoke of is the vacuum system, that is, by a special apparatus that was attached to a large steam coil, the air was turned out of the latter and a vacuum of from 6 to 10 ounces was produced, on the exhaust side of the engine, so that instead of having a back pressure of from 3 to 5 pounds as is usual, where exhaust steam is used, we actually had a vacuum, that is, we were making condensers out of our radiators. This was particularly advantageous in our case, as our engine was heavily overloaded, and our boiler was hardly able to supply the full pressure to the engine. Where large quantities were taken off the radiators, as was the case before the vacuum was installed. The use of the pumps for returning the hot water to the boiler is, I believe, admitted by all steam engineers to be superior to the use of traps. Traps are trappy. That is, they are liable to get out of order, whereas with the use of a hot well connected with radiators by return pipes, pumping the hot water, which is returned to the well at nearly boiling point, directly into the boiler and a regulator for starting and stopping the pump, as the water rises and falls in the well, the greatest simplicity and greatest

certainty is obtained. I believe we operated this apparatus for a year and a half with an expenditure of not over ten or fifteen cents for repairs.

E. M. Pike: I will say that the system of drying that I had in my old factory was similar to that discussed here. I had a tank that was under ground and I pumped the water from the bottom of that cistern. The cistern was about eight feet across and ten feet deep. The water that was condensed and run back to the boiler and if there was a surplus or overflow that fell into the drain and into the cistern and any oil that was in it stayed on the top, and I just pumped the water out of that cistern from the bottom, and the oil and water separated themselves.

H. C. Dunn, Erie, Pa.: This is the first time I ever got up to talk in the Convention, I am pumping this condensed water back into the boiler. We dry with the exhaust heat ten hours a day and then for fourteen hours we use live steam. I had a boiler inspector come to my place after I had been pumping this oil and everything right back into the boiler, and the boiler inspector asked me what I had been doing to my boilers? I told him I had not used any compounds and I began to be a little alarmed. I had been told by some boiler men that I must not pump this oil and water back into my boiler and I asked the inspector what was the matter, and he said he had never come across a cleaner lot of boilers in the city. I told him I was pumping the oil right back into the boiler. The lubricating oil I was using was the natural oil. I was getting it right out of the ground in our neighborhood. I pay 12½ cents a gallon. I was afraid to trust the Standard Oil Co., so I got it right from the well, and that was the oil that I had been pumping into my boilers. There is not a particle of scale in the boilers and they are all right.

Mr. Eggers: Was the water in the boilers foamy?

Mr. Dunn: No sir, not a bit of foam. The cylinder was a "honey." I had the inspector look at that. The exhaust steam goes back to the radiator. I have 10,000 feet of pipe in this radiator. I put in 30,000 brick a day and take out 30,000 a day. The dryer holds all that for two days and a little over, so I take out 30,000 pounds of water every day. When the brick go into the dryer they weigh a pound more than when we take them out, so if we put in 30,000 brick and take out 30,000 every day, you can readily see how we do it.

Secretary Randall: It is getting late and we must pass on to the next. We have covered Nos. 14 and 15. The next, No. 16, is "From an Economic Standpoint, What is the Most Desirable Length for a Steam Tunnel Dryer?"

Mr. Eggers: One hundred to one hundred and twenty-five feet.

Mr. Adams: I have never used but one and that is one hundred and fifteen feet, but I believe one one hundred and twenty-five or one hundred and thirty feet would be more economical, but the lay of the land was such that I could not extend my dryer.

Mr. Townsend: Our dryer is one hundred and twenty feet and gives good satisfaction.

Mr. C. H. Carpenter, Martin's Ferry, Ohio: We are using a steam dryer that is sixty by one hundred and twenty feet.

Secretary Randall: We would judge by the replies that the best length should be about one hundred and twenty feet. Question No. 17, "Can Common Brick be Made as Cheaply on Dry Press as on Stiff or Soft Mud Machine?"

Grant Dibert: We are using both processes. We cannot sell a dry press brick for a common brick. We can make them just as cheap, but we cannot sell them as well as we can a common stiff mud brick.

Mr. F. Plumb: We are running two plants, one for stiff mud and one with dry press. So far as the labor problem is concerned, we think it is in favor of the dry press. There are some other expenses, such as the fuel problem, that will go the other way. It costs us a little more to make stiff mud pavers than it does dry press builders. This is our experience.

Mr. Townsend: We make dry press brick and semi-dry press brick. We find the dry press more expensive than the semi-dry or stiff mud brick.

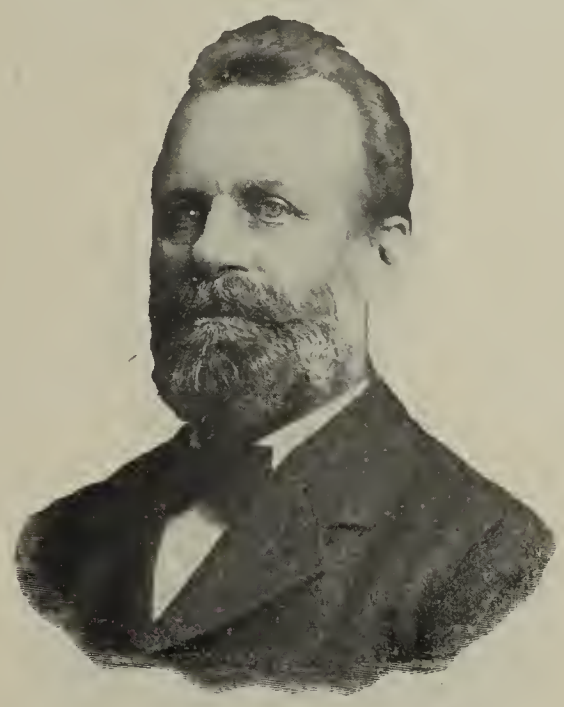
Secretary Randall: Question 18 reads: "Is it a Fact That One End of a Dry Pressed Brick is Heavier and Denser Than the Other? If so, Can it Not be Remedied?"

Mr. S. S. Chisholm: We have not heard whether it is a fact.

Mr. J. W. Carson, Montezuma, Ind.: Not many years ago, one end of a dry press was heavier than the other, but it is not so to-day.

Mr. Yates: The only solution I see is that if one end of the brick was nearer the flame it would burn harder and be heavier. You all know that the brick near the fire is heavier than those in the center.

Mr. Ittner: I have not spoken in this Convention yet (laughter), but I will say a few words now, just simply to let you know I am here. I think differently from what Mr. Carson does, and yet I do not know but what he is right, and the reason that I could not assert positively that there is no difference in the weight of the two ends is because I have never weighed them to find out. I do not think the last speaker arrived at the proper conclusion at all. I will state what in my opinion is the cause of the difference, if there is a difference. You see the dies are placed in the press lengthwise with the charger. The charger passes over the mold lengthwise and the clay falls into and partially fills one end of the mold first. The fall being perpendicular as it must be there is no clay in the mold when it begins to fall. Just as soon as there is an angle of 45 degrees formed in the falling operation then the other portion of the mold is filled more gently. I believe if it was weighed (and I may weigh this for my own satisfaction when I get back home, so that when I come to the next Convention I will be able to speak more understandingly), I believe the end that filled in the mold first would weigh the most. I believe there is a difference in machines. It is possible there may be a machine where the charger goes over and stands perfectly over the mold before the lower die begins to recede. If that is the case then my argument would not hold good. This objection, if it is an objection, or this inequality, would not obtain, because the whole charger box would move forward to its legitimate position and then the bottoms of the molds would go down and the clay would drop uniformly into the die. One reason that causes me to believe there is a difference in the weight of a dry press brick cut in two is, unless



ANTHONY ITTNER, St. Louis, Mo.

we watch our guides very closely—that is the guides that guide the upper plunger—they will wear more in front, and that indicates that the clay in the rear part of the mold that falls first is denser, it throws the guides out of line and unless we keep these guides true and in their places we are apt to get a brick that is wedge shaped. I used to think when this plunger came down with such force it would regulate this clay and it would be uniform, but such is not the case, but the first gentleman that ever called my attention to this was Mr. Andrus.

President Gates: We would like to hear further from Mr. Chisholm on this subject:

Mr. Chisholm: It is an established fact that, with a properly constructed machine, the rear end of a brick will not be heavier than the front end. Mr. Ittner has just explained the difference between some of the machines he has used. In the Boyd press the charger is always brought entirely over the plunger before the plungers begin to recede, hence the die—just as Mr. Ittner has said—would be evenly filled. If, however, you are using very heavy material, making silica brick or some kinds of fire brick, there is a tendency on the part of the material to pack heavier in the rear end than in the front end if the charger is overfull. This, however, is easily corrected in a properly constructed machine.

Regarding the action of the plunger, in making one end of the brick thicker than the other, it will be found that if the pressure is applied evenly or centrally upon the upper plungers there will be no tendency for tipping, consequently the brick will be of even thickness. In the Boyd machine the lower plungers are independent of the lower crosshead, unlike the machines used by Mr. Ittner, and therefore adapt

themselves to the even pressure on the opposite side of the brick. If you find your brick are heavier at the rear end than at the front end your press should be arranged so that the lower plungers do not recede down into the mold until the charger is well over the die. It should also be observed that the charger should carry forward but little more than the proper quantity of clay each time to fill the die.

Secretary Randall: The next and last question, No. 19, reads, "Is There Any Real Bond in a Dry Pressed Brick Before Burning?"

Mr. Eudaly: Why certainly there is.

Mr. T. P. Plumridge: I was glad to hear Mr. Ittner speak a little while ago. Last year at the Convention I heard the remark that this Convention was getting to be run in the interest of the paving brick people, and that the dry press business was put down to the end of the programme, and we were shoved back in the rear. Now, I am not very old in this Association, but I am making dry pressed brick and if I can do anything to help the dry press people I want to do it. I will take any brick made on a Boyd, or Whittaker, or Andrus, or even hydraulic press, and stand the brick on end as it comes from the press and put Mr. Eudaly on top of it and it will not go down. It is a common trick among dry press salesmen to take a green brick from a press and using it as a hammer, drive a nail into a board with it without crumbling the brick. This proves that there is a bond in a dry press brick before it is burned.

President Gates: I will ask the Secretary to read the names of those appointed on

—The Committee on Resolutions.—

Secretary Randall: The committee consists of J. Parker

C. H. Yohe, Alexandria, Va.

Fiske, Boston, Mass., chairman; W. H. Hunt, Cleveland, O.; R. G. Eisenhart, Horseheads, N. Y.; F. Salmen, Slidell, La.; C. H. Yohe, Alexandria, Va.; D. V. Purington, Chicago, Ill.; L. Parker, St. Louis, Mo.

Adjourned.

FOURTH SESSION.

Friday, 9:30 a. m., Feb. 9, 1900.

President Gates: The Convention will come to order. We are honored very much by a visit from the mayor and the members of the Board of Public Works this morning. The Secretary will announce the first order of business.

Secretary Randall: The first on the programme this morning is a paper on "Brickyard Pilgrimages," by Charles H. Bray, Helena, Mont. As most of the older members know, Mr. Bray is a faithful member, and has rarely missed a meeting for some years. He usually extends his Convention trips some weeks, visiting representative brickyards, and we had hoped he would be able to give us something quite interesting. He is detained at home by sickness, as you will see by the following letter:

Helena, Mont., Jan. 30, 1900.

Friend Randall: Yours of the 26th inst. received to-day. I regret very much that I will not be able to attend the Convention this year. I have had a hard time of it for the last month. I was taken sick a month ago with inflammation of the stomach, and it came very near doing me up, and I don't feel as though I ought to undertake the trip under the circumstances. I am very glad you have arranged with Mr. Purington to take up the paper you have assigned to me. I inclose postal money order for my dues and subscription to The Clay-Worker.

Hoping to be with you next year, I am, with best wishes to all, yours truly, C. H. BRAY.

Mr. W. S. Purington, of Galesburg, Ill., has promised to fill the gap with a short talk on

—Brickyard Pilgrimages.—

W. S. Purington: I do not see how the Secretary could have got word to Mr. Bray by letter after making arrangements with me, as the first word I got of this was the day before I left for the Convention. I hardly think that many of us realize the advantages we derive from making pilgrimages to other plants, especially visiting plants or factories where they are making the same material as ourselves. We have always made it a point in our business to make a trip at least once a year throughout the country, seeing the different methods of manufacture, and I am satisfied that we have derived double the value of the cost of these trips. Parties we visit also derive a certain benefit, just as they do in meeting together in these conventions. I think there are very few yards in this country that are not open to you. Of course there are some who close their doors and lock up their plants when they see us coming, but they are the exception. I know of but three in this country that do that, and the sheriff finally locked them up. I made a trip this fall, visiting all the large paving brick factories in the East, for the purpose of finding out all I could in regard to the taking of the heat out of cooling kilns and putting it into the dryer for drying brick. I am satisfied that what I found out was of great value to me, although I do not think there has been any rule or system adopted by which we know the minimum and maximum size of flues and the best method of taking the heat from the kilns to the dryer. Mr. Fiske told me last night that he had visited pretty nearly all the plants in the United States, and I think he would be a better man to talk on this subject than I am. He had an object in view, as we all have, when we make these trips, and I am sorry he is not in the room now to tell us something about his pilgrimages. As I told you, I did not know that I was to speak on this subject or I should have prepared something. I presume there are others here who can give you more information.

Secretary Randall: The next in order is a paper entitled the "Market Side of the Paving Brick Industry," by Mr. F. B. Stevens, of Detroit.

Mr. Stevens: The subject which has been assigned to me is a very large proposition, and I am sure you will be glad to hear me say I have only prepared a ten-minute paper.

THE MARKET SIDE OF THE PAVING BRICK INDUSTRY.

By F. B. Stevens.

Mr. President and Gentlemen of the Convention:

In this progressive age there are books and papers written upon all subjects. The studious individual can with equal facility acquire a theoretical knowledge of "how to swim" or of "how to get rich." Either theory, when put into actual practice, whether in a sea of turbulent waters or in the maelstrom of business competition, will become of little value. Still it may not be out of the range of possibilities to believe that in the near future some enthusiastic individual will feel called upon to write a book upon "The Market Side of the Paving Brick Industry."

It is not from the basis of a manufacturer that I am to consider this subject, but from a little experience as a seller of paving brick, the product of others.

The position of the middle man—appropriately named—is often most undesirable. In case of a difference of opinion, or of contention, concerning quality of conditions, say between a corporation to whom he sells material and the manufacturer from whom he furnishes his supply, his position, if justly filled, becomes that of adjudicator of differences, a righteous judge between opposing forces. If just he is impartial; if impartial, he sees the faults of both. It will not be disputed that it is more difficult to harmonize many minds than it is to influence one. To sell to a corporation, to complete the details of such sale with perfect satisfaction is a task, compared to which the ordinary transactions of commercial life between two individuals sink into insignificance.

If it be on the one hand the Board of Public Works, following the advice or suggestion of the city engineer, who recommends the material, which action is approved or rejected by the Council,

or whether it be, as in some interior cities, the entire Council votes upon the recommendation of the street committee, it is quite often the case that such favorable action is not unanimous, and the minority is left to criticise. Woe betide the luckless seller of paving brick who incurs the enmity of one of the "many men with many minds" who make up the municipal intellect. The municipal mind is exacting "to the last hour of act," even where the individual mind, under like conditions, would be reasonable, yielding and considerate.

I have seen paving brick "inspected" and thrown out by "inspectors" who could scarcely distinguish brick from mud, who had been appointed about election time as a reward for their well-doing in other lines, and therefore must, necessarily, show a pile of chips. They showed it. Good brick were thrown out, poor ones put in the pavement, but nevertheless the pile of culls showed that they had been "on the job," and, of course, their report was final. I have seen paving brick, on account of their color, or lack of it, thrown out, when uniformity of size close, compact fracture, freedom from laminations, and other indications which we are wont to consider evidence of good material were disregarded because of a slight change in complexion. These are only a few of the ills to which the business of selling paving brick is subjected. There are others.

The rattler test, for instance, under existing conditions, is most uncertain. Long bricks, short bricks, fat bricks, lean ones, dumped promiscuously into an iron cylinder, together with cubes of iron or irregular castings, as the case may be. One brick, longer than some of the fat ones, is perhaps carried part way around with the cylinder until it reaches the top, then down it goes with a thud, and off is knocked a corner. This loss, when the brick is taken out and weighed, is called abrasion loss. Of course, this is not fair, unless each particular brick is subjected to the same conditions. Under existing methods this is not possible.

I saw, some time ago, a blue print of a cylinder constructed for the purpose of testing brick, to the inside of which the brick were firmly clamped, and the street surface of the brick is subjected to the wear of the loose material in the center of the cylinder. This doubtless is the nearest approach to uniformity in the present method of a rattler test. It is, therefore, something of a guide, but it should not be final, and, no doubt, it is quite often that good brick are excluded on account of a lack of careful and uniform test methods.

The brick that receives all justice in a rattler test is like the immortal Joey Bagstock—"He's tough, ma'am, tough, and devilish sly." There is, of course, to this subject—the selling of brick to corporations—like that of all others, another side.

I believe there are two distinct or individual departments to any well-conducted manufacturing business—a manufacturing department and a selling department. Perhaps I should say that these departments should be distinct and individual in their management. The management of one should not include the management of the other. In short, the business of both departments should not be outlined, arranged and controlled by the same man or men. If the selling department of a paving brick industry finds difficulties to contend with, such as I mention; if brick are not carefully selected for shipment; if culls are allowed to go out, as they are sometimes, in too large a proportion, often in the very first shipment on a new contract, the selling end should hold the manufacturing end responsible, and correct the error before it is too late in the one case, and prevent it in others. One man cannot give good service and cover too much detail. It is only by concentration of purpose that the result desired is effected. If a lot of green hands are hired in summer to load brick, when the superintendent cannot be omnipresent, and the manager is away attending brick lettings or at the office arranging the commercial details of business, if economy is too much sought for in the manufacturing end, such economy will eventually swell the expense account, or the "cull" account, and the selling end will suffer, no matter how profuse the eloquence or explanations of the representative at the selling end may be, whether he be a middle man or an employe.

There are other improvements that it may not be out of place to suggest, but which, perhaps, are not so easy to accomplish. The lack of exactness of size of brick now existing in the products of one kiln, on account of the uneven heat in that kiln, leaves the opportunity open for any contractor to introduce a claim for damages, though it may be proved groundless. This lack of conformity of size to sample, while "not so deep as a well nor so wide as a church door, yet 'tis enough, 'twill serve" that he may declare it necessitates the increased use of tar or cement filler, increased labor in selecting or gauging brick to keep straight the lines of the pavement, or make a dozen other claims to delay or prevent settlement.

It has been suggested by some city authorities that, if the manufacturers would adopt a uniform size, so that a street laid ten years ago with a brick now out of the market might be easily repaired with another brick, the size being the same, the new patch would "tooth in" with the old pavement. Whether this plan would be of any advantage to manufacturers is a question.

It is said that every man thinks his business bristles with the greatest thorns. Socrates thought that if all our misfortunes were laid in one common heap, whence every man must take an equal portion, most persons would be content to take their own and depart. However, to smooth all the rough places, to correct all the errors, would, indeed, require the sum of human wisdom.

I fear the increased demand for paving brick may change the maxim of the manufacturers to quantity instead of quality in portion. It is now, therefore, an opportune time for each manufacturer to economize with expense, to equip with necessary facilities, to provide sufficient working force to cover all the details so long overlooked; in short, to aim his arrow at the star, even though, perchance, it hits the cat on the fence.

With more care and more pains at the factory, and consequent better results, the city authorities, I trust, will soon recognize the better standard, will become less rigid, less suspicious and less exacting. Then the cares of the paving brick manufacturer will become an unknown quantity, and he may once more enjoy the refreshing sleep of his youth. When such a possibilty becomes a fact, the seller, the middle man, who has born "the whips and scorns of time," should not be without his reward. He also may hope to win "golden opinions from all sorts of people."

—Inspection of Paving Brick—General Discussion.—

President Gates: You have heard this most admirable paper. Are there any remarks upon it? It is well worthy of discussion.

Mr. Plumb: I want to offer an idea. Perhaps it has been discussed in the Convention before. If so, all right. It seems to me to avoid one of the difficulties alluded to in that paper it might be well to secure some plan of inspection at the yard before shipping. In structural iron and steel the

F. B. Stevens Detroit, Mich.

inspection takes place at the place of production, and it is done by parties who are competent and honest. It would not be expensive for the city authorities who are about to use that make of brick to send a competent man and keep him at the place of production while the brick are being loaded on the cars. I just offer this that you may think about it, and possibly some time we may get around to a satisfactory method. I have heard of brick by the thousands and hundreds of thousands being shipped to a distant city and piled down on the street and then be rejected by an inspector, just or otherwise, and the loss is great. The better way would be to have them inspected before they left the plant.

Mr. Eudaly: You all remember Mr. Otto Geissen, of Canton, O., who has now gone to the better land. A few years ago he made a contract with the government at Washington for a large number of paving brick, and they said the brick would have to be inspected. He said to them: "If you will send your inspector to my works and inspect the brick as they are loaded on the cars, all right, but I will not send one carload of brick to Washington and have them inspected there." And the government sent a man to his plant and the brick were all inspected there.

Mr. D. V. Purington: There is due reason in all things. There is a good deal of meat in Mr. Plumb's suggestion, but it frequently happens that his suggestion would be entirely impractical. For instance, I have in mind one contract made last year for several hundred thousand brick where the con-

cern was four months in filling. Now it would not have been fair for a municipality to keep an inspector at that brickyard for four months. And that would happen to a more or less degree with all small contracts. I see how with a contract of several million they could afford to keep an inspector. I want to take exception to one of Mr. Stevens's suggestions, and that is where he said the general manager or superintendent should have nothing to do with the sales. The greatest trouble I have had is where these things are separated or divided. I do not believe you can be successful unless the man who is manufacturing the brick and shipping the brick knows pretty nearly what is wanted and is in close connection with the sale of the brick. I have had the men under my supervision "kick" very vigorously because their ideas and mine did not agree as to what was meant by a No. 2 repressed brick, whereas I, who sold the brick, knew just what was sold. He who delivered the brick (I am not referring to W. S. Purington) concluded that he knew better than I did what was wanted, and then trouble followed. I want to say to you that the nearer you get the mind of the seller of the brick and the mind of the shipper of the brick in contact the better results you have. There must be the most perfect understanding between the manufacturing end and the selling end of the business. If there is not you are going to have trouble all the time. I want to say I have just as little to do with middle men as I possibly can. They are a sort of a necessary evil, but I do not believe in them.

Mr. Plumb: Four months is an unusually long time to take to deliver 700,000. It would not be necessary to keep an inspector there all the time. When a few thousand are ready to ship the inspector can come and inspect that shipment and then return home, and come back when the next shipment is ready.

D. V. PURINGTON, Chicago, Ill.

Mr. Yates: It is a waste of time and labor to pile up several thousand brick and wait for an inspector to come before they are loaded on the cars. It is economy to load them from the kilns to the cars. I have a better way. We ship the brick and then send word if any of those brick are condemned they are to hold them until I arrive. Then I take up the matter with the men there, and I have come out very successful. With this plan we can get the brick back home, and then we can sell them for what they are worth. If a cheap inspector makes a complaint against your brick let him show where the fault lies, and you are there to vindicate yourself.

Mr. Purington: I want to call attention to Mr. Yates. We were certainly led to believe by the remarks he made yesterday that he never had any poor brick. (Laughter.) I think a manufacturer should not make poor brick, and then he will not have his brick condemned. (Laughter.)

President Gates: There are exceptions to all rules. If there are no further remarks we will take up the next number, which the Secretary will announce.

Secretary Randall: The next on the programme is a paper entitled "Construction of Brick Pavements," by George R. Grimes, of Terre Haute. Mr. Grimes is an experienced city engineer, and has taken the trouble to prepare a paper on this subject for us, for which he is entitled to our sincere thanks.

CONSTRUCTION OF BRICK PAVEMENTS.

By George R. Grimes.

Mr. President and Gentlemen of the Convention:

The construction of a brick street means to a reasoning and intelligent people a public improvement for the public benefit. It means a good, durable, economical and highly sanitary public highway for wheeled vehicles. It means a perfect roadway for town and country.

Much depends, however, for the above conditions upon the character of the construction. It is an essential element, combined with good material. The one without the other will make only an acceptable highway, but combined produce, all conditions considered, the best public highway known.

But, since I am to deal with the manner of construction, I will respectfully submit the knowledge of my experience under the following heads, and gratefully request the gentlemen of the Convention to temper their criticism to comport with the trite saying, "Put yourself in my place," as this is my maiden effort in this line:

First—The subfoundation, commonly called grading.
Second—The curb setting.
Third—Intermediate foundation of concrete.
Fourth—The sand cushion for the brick.
Fifth—The laying and rolling of the brick.
Sixth—The provision for the expansion and contraction.
Seventh—The filler for the interstices, commonly called grout.

There is much to say under the head of subfoundations, or the preparation of mother earth for the reception of the balance of the structure, more than I will probably touch upon.

The character of the soil, whether it be sandy or clayey, is of little consequence, as it is essentially necessary in my judgment to have all pavements impervious, then the subfoundation is but little, if any, affected by the element that makes bad roads, moisture.

Importance should be attached to the determination of the contour, or the curvature of the road bed, giving it as nearly as possible a plain surface. The compacting by rolling with a steam roller should be well and thoroughly done. This is accomplished best with a roller weighing not less than five nor more than eight tons, one between the two, in my judgment, is preferable.

If a twelve to fifteen ton roller is used contractors, as a rule, will not pass over the surface more than twice, and often but once. Specifications rarely name the number of times a subgrade should be rolled. My experience has taught me that a lighter roller passing many times over a subgrade gives better results than a few rollings by a heavy one, and gas and water pipes are in much less danger.

The prime factor in a finished subgrade is uniform density of the top stratum of earth. Eliminate all soft places, so that all settlement (and there will be more or less) will be uniform; make the contour of the cross section as nearly perfect as possible; bring the condition to such perfection that you get the minimum amount of settlement, and then you are ready to apply the concrete.

Under the head of curb setting my practice has been, after the heavy part of the grading has been done, to have the curb all hauled and distributed in the roadway along the curb lines. The trenches should be dug to the proper depth, allowing always for a foundation of some kind, either gravel or broken stone eight inches in depth, or concrete mixture six inches in depth. It goes without saying that the concrete is always the best, but a curb can be well and substantially set on gravel or crushed stone. With whatever material, it should be reinforced in the rear with a wall of the same, six inches thick, and up to within four inches of the top. The essential points to observe are perfect alignment, perfect surface elevation and thorough tamping. With these items well maintained the sidewalk curb is well set. The marginal curb, that which sustains the pavement against the unpaved opposing street, or at either end of the paved streets, should always be set on a concrete foundation, as I have found this to be the only means to prevent the settlement of same, occasioned by the pounding received by vehicles passing from an unpaved street.

The marginal curb should always be dressed on the top and four inches down on the inside, and set to conform accurately to the curvature of the street. After the curb is set finish the subgrade, using the top of the curb as a constant guide in this finishing process. Now comes the application of the concrete mixture, and, in my humble opinion, all permanent pavements should have concrete substructure, either of screened gravel or crushed stone. For the brick pavement either, in my judgment, is highly suitable.

The generally accepted manner of mixing sand, cement, stone or gravel, as given by the best authorities, needs no comment here.

The platform for mixing should be of metal, 10 feet by 12 feet, 3-16 to ⅜ inch thick, mounted on two oak runners about 3 by 4 inches, one on either side, flush with the edges, with suitable handled chains for drawing forward. When in position for service the center of the platform will lie flat upon the subgrade,

making smooth wheeling for the barrows of material.

Before applying the concrete on the subgrade stakes should be driven, marking the top of same, not over five feet apart, both parallel wiith and at right angles to the curb line, checking the whole surface of the subgrade into five-foot squares, with a stake at each corner of the same. By this means the tamper will have but little difficulty in maintaining the true contour of the cross section, and insuring a parallelism between the subgrade and the concrete. This I deem of much importance. Each section of the work from the subgrade to the brick course should have as nearly parallel surfaces as is possible to make.

To mix the concrete, the sand should be evenly spread over the platform, and for the best results should be clean, sharp and dry, then add the cement, spreading evenly as in the case of the sand. Mix in this dry state thoroughly, or until the whole shows an evenly colored mass, free from all streaky appearances; then add sufficient water and thoroughly mix until the mass attains a consistency which will readily subside of its own weight when thrown into a cone-shaped heap; now add the dampened stone or gravel, and turn the whole mass over with shovels at least three times, receiving its fourth turning when carried from the platform to the place of deposit, which should be done with shovel, too. Some laborers become very expert at this work, as there is quite a sleight in turning it over in casting it from the shovel to its proper position. When a gang of men acquire all these details the work progresses rapidly and satisfactorily in this manner. I have had no experience with machine mixing.

The tamping of the concrete is best accomplished, in my opinion, with a wood tamper, made of a piece of oak timber 8 or 10 inches square, and about 8 inches long, with a round handle inserted in one end about 5 feet long. Nail to the bottom a piece of 1½ or 2-inch oak plank, which can be removed when it becomes worn and rounded at the edges, and a new one put on. In proper hands this will leave the concrete showing sufficiently free mortar and a smooth top surface for the reception of the sand for the brick cushion.

The concrete thus applied should remain undisturbed from 48 to 60 hours before proceeding with further construction. In extremely dry and hot weather an occasional sprinkling is of much benefit.

The sand for the cushion, in my opinion, should be of a soft, velvety nature, free from foam and all foreign matter; yet a sharp sand can be used, but I imagine the soft sand will receive a fuller impression of the brick and give a better cushion.

The spreading of this sand, or bedmaking, as it is commonly called, is of much importance, and should be scientifically done, and not delegated to the eye of a laborer with a hand screen, but a template made conforming to the true curvature of the cross section of the roadway, the full width of the roadway if under thirty feet, if over thirty feet, use the same for one-half the roadway. This template can be made of a light wood two inches in thickness and of sufficient width to admit of forming the proper curvature and of required length, either for the whole or half the roadway of the street. If for the whole of the roadway, if under thirty feet, it must be sustained by stay and truss rods to keep it from bending and sagging. Each end must be armed with a cross head with two metal rollers, mortised in to carry it along the top, and one in the end to carry it away from the curb. If using only one-half of the width of the street, the center to roll on a 4 by 4-inch piece and 10 or 12 feet long, set carefully to grade and line. The template may be drawn by man or horse. A device of this kind not only insures a perfect surface to the sand for the reception of the brick, but compresses it more evenly than the hand screened method.

The foundation now being prepared for the brick, I know no better method of laying them than perpendicular to the curb line, except at street intersections. Here the best plain, in my judgment, is to start at the intersection of the center line of the two streets, and lay at an angle of 45 degrees toward the curb corner, making a triangular shaped section of the four quarters, closing them against the perpendicularly laid brick on the curb line of the two streets.

The most economical way of getting the brick to the men who lay them from the piles along the curb lines at either side of the street (where they must be deposited previous to the grading of the roadway) is by barrows wheeler on planks at all times, never allowing them wheeled over the bare brick, as it settles the brick in single rows, when wheeled lengthwise, or a single line of depression when wheeled crosswise, and then, when the process of rolling takes place, these impressions are hard to completely remove.

To maintain a close contact of the brick throughout the whole work the barrows, before dumping, should be turned perpendicularly to the alignment of the track, and tilted with the brick slide gently out toward the curb. If dumped otherwise there is a continued widening of the joints and a disturbance of the alignment of the rows of brick, which, for their entire length, should be perpendicular to the curb, or as nearly as can be made so.

The work is now, after being swept clear of all bats and spalls, ready for the steam roller, which should not be less than four or more than six tons in weight, but one between is preferable. Start the roller at the center or crown of the street, and roll back and forth until the curb is reached, avoiding too close contact with same.

The passing of the roller should not be faster than a very slow walk, thus avoiding giving the brick a careened position in the sand cushion, which will invariably follow if the first passage of the roller is too fast, and is subsequently very hard to remove. After the brick have been thoroughly imbedded in the sand cushion by the slow process of rolling the speed of the roller may be materially increased.

When this longitudinal rolling has been fully accomplished commence at either end of the thus finished work and pass the roller transversely over the brick at an angle of 45 degrees from curb to curb; repeat the same work, commencing at the opposite end of the brick, and pass across in the opposite direction. Before rolling begins, however, the brick should be thoroughly inspected and all defective ones removed and replaced by perfect ones. Under the head of expansion and contraction my experience has been less in the effort to overcome it than in the observance of its effects. These defects all are no doubt familiar with. The greatest and most unpleasant sounds coming from a brick pavement are due to expansion, and are heard in midsummer when the brick reach their maximum, and is caused by a lack of contact between the brick and sand cushion, occasioned by the resistance of the curb at either side of the roadway not being sufficiently great to arrest the lateral expansion in elevating the crown of the street, and thereby disturbing the contact between

Geo R. Grimes, C. E., Terre Haute, Ind.

the brick and the sand cushion; then following the wheelage, the rumbling sound, this may be readily avoided by applying between the ends of the brick and curb on either side of the roadway a cushion of asphalt or No. 6 pitch, applied in the liquid state. This, in my opinion, is all the provision necessary to overcome the objectional feature of expansion, except that all brick should be laid during a summer temperature, the individual brick is then at practically a maximum expansion. In apply the elastic bond above mentioned between the ends of the brick and curb you prevent the brick work from bonding with the curb, as it will necessarily do with the cement filler, thereby allowing the longitudinal expansion freedom of action which will expand itself at the ends of the street, or vibrate back and forth, doing but little damage; however, this is somewhat theoretical.

Now we come to the filler, which is, in my opinion, the most important element connected with the construction of a brick pavement, and on which depends the beauty, durability and life of the structure. In my judgment, the cement filler is the best, and none other should be used. The mixing and application of the cement filler needs the most careful and intelligent attention. It is presumed, of course, throughout this whole discussion that the very best materials only are considered, as they are essential elements in all good work. The sand entering into this mixture should never be other than clean, sharp and dry, and in that state mixed with an equal part of Portland cement until the mass assumes an even and unbroken shade. In other words, thoroughly mix until each individual grain is completely coated with the cement, then water enough added to make a liquid mixture of the consistency of very rich cream, and from the time the water is applied until the last drop is floated over the brick kept in

constant motion, never allowing the mixing to rest.

This process is most rapidly done with a good-sized hoe. To do this successfully I provide a box 3½ to 4 feet long by 27 to 30 inches wide and 14 inches deep, resting on legs of such different lengths that will float the mixture readily into the lower corner of the box, which should be about 8 to 10 inches above the pavement. To remove this liquid from the box use an ordinary scoop shovel, casting its contents before the gang of sweepers, who are armed with ordinary warehouse brooms, immediately sweeping the mixture into all joints. It should be applied in two courses, the second course being mixed a little thicker then the first. After the application of both courses and the work has progressed say 15 or 20 yards, the force should be turned back, accompanied by a man with a large sprinkling pan, the rose being perforated with very small holes, gently sprinkling the surface ahead of the sweeper. This last sweeping fills up all places that may have been left after the first process, and fills joints which have shrunk and settled below the surface of the brick, and for these purposes take up the surplus material on the top of the brick. It is advisable to then cover the finished work with a light coating of sand, and in very dry and hot weather an occasional sprinkling with a garden hose is necessary. This finished, the work should never be subjected to any disturbances, and not open for traffic for from seven to ten days after completion.

I have secured some superior construction in following the general line of the foregoing paragraph. Of course there are many minor details presenting themselves constantly as work progresses which need intelligent care and attention. Brick streets have not attained their proper and justly deserved position in the

W. P. Blair, Terre Haute, Ind.

category of public highways for the simple reason of faulty construction. If the standard of construction had kept pace with and advanced hand in hand with the high class of material (I especially refer to paving brick) we have to-day, there would have been no question as to the kind of material cities would to-day be specifying for their highways, as, in my judgment, all others save brick would have been relegated. And, gentlemen of the Convention, the day is not far distant when vitrified brick will reign supreme as material for public highways, and, not stopping there, will supplant all others for building purposes. (Applause.)

—Construction of Brick Pavements—General Discussion.—

Secretary Randall: I will say in the absence of Mr. Grimes that I regret exceedingly that he is not here to answer all questions that you might want to ask. The brick streets of his city (Terre Haute, Ind.) show for themselves that Mr. Grimes is thoroughly competent to discuss this subject. They have brick streets there that have been down under fairly heavy traffic for six or eight years, and they are just as smooth as this marble floor. The splendid condition of those pavements is due to the great care exercised in the little details of the work—the laying of the brick, preparing the filler and the rolling of the brick. Some contractors seem to think that anything will do, just so the pavement is rolled. It is these little details that he tells about that will give you a strictly first-class brick pavement, than which there is nothing better under the sun. Mr. W. P. Blair is one of the brick manufacturers of Terre Haute and knows all about how these pavements are laid, and I will be very glad to have him supplement what I have said.

President Gates: I have had my eye on Mr. Blair ever since he came into the room. It was my pleasure, as I have told you, to spend a few hours with Mr. Blair recently in Terre Haute, and, while I did not see Mr. Grimes, I saw some of his samples, and they made a great impression on me. It is as Mr. Randall has said: they have the two things there—good brick and good construction.

Mr. Eudaly: I am wondering if, between the Secretary and President, they will leave anything for Mr. Blair to say. (Laughter.)

Mr. Blair: Gentlemen, I really think there is nothing left for me to say. I do myself feel like congratulating the officers of this Association in being able to secure the paper that has just been read. What few people of this Convention I have the pleasure of being acquainted with have all found out by this time, perhaps, that I am almost a crank on the subject of the construction of brick pavements. Anything that I should say in connection with this I do not want to be understood as in any sense an advertisement of the brick of my own manufacture at all. I think most of the brick pavements in this country show that the quality of the pavements has been centered only in the quality of the brick, and, if I may be allowed to say so, I think the paving brick manufacturers of this country are largely to blame for it. So far as the quality of the brick is concerned, we are making a magnificent one; there is no doubt about that. Entering into the construction of the brick pavements of Terre Haute, I believe that there are, perhaps, brick of six or seven different manufacturers. They are not all the same size, and it makes mighty little difference, let me tell you, as to the size of the brick, if you get it in the street right. I do not know that I can better emphasize the position of that paper in any other way than to take out of it a little bit of the show of modesty that is in it all the way from beginning to end. That is all I have to offer in criticism of that paper. I am really sorry that Mr. Grimes is not in the room, that he might come before this Convention and say for himself some things that I really think he ought to say, and which he failed to say in that paper because he was too modest. He understands his business from beginning to end. I recall now the first experiment with pavements in Terre Haute. The brick were ordered, I believe, from Canton, O.; that was some time before our factory was erected and in operation; we have supplied all the brick in that territory since we have been in operation. It was a large order, something like 7,000,000 brick. The first contract was not secured by Mr. Grimes and his partner, but was secured by another party; Mr. Grimes had a good deal to say in that construction, and it was put in fairly well. This was done years ago. In putting in this pavement you can imagine the number of brick that were culled out—those that were overburned and those that were underburned. Soon afterward there was another street that the property owners wanted paved, and by a sort of an agreement between the property owners and Mr. Grimes it was arranged that Mr. Grimes should put into that street the "culls," if you please, of those Canton brick. It was constructed in the same manner as described in that paper, with the possible exception of the expansion cushion. He put down that street, and I want to say to you, as solemnly as I ever said anything in my life, that in that whole street, made out of Canton, O., "culls," there is not a chip off the whole street as much as there is in a square yard of all the pavements I have seen in the city of Detroit, and they were condemned brick. Now I am not going to speak very long, and I hope I will not be very tedious, but I am so wrapped up in this idea of good construction that, whether it is worth anything or not, I suppose I could talk all day. I want to mention one or two other things. The next street that was constructed was a street over which about five thousand teams pass daily. That has been in use now about seven years, and there is scarcely a chipped brick on the street. It is in better condition to-day that when new, because the rough surface is slightly worn, and that is the only wear that a street ever gets when properly constructed. I believe that if any of you gentlemen were to walk over that street, from one end to the other, you would say that it would be a good street without a cent's worth of repairs for twenty-five years to come, and five thousand teams passing over it every ten hours. Now, I do think, if the manufacturers of vitrified brick in this country will stand behind the idea of good construction, that the requirement of five, six and seven years' guarantees you are now asked to give upon your brick will not be thought of. In connection with this test of paving brick, the rattler test, or so-called rattler test, that we are all subjected to, and that we have all thought so much about,

and that is in the minds of the members of this Convention now, if, along with it, we will force our recommendations on the cities throughout the land, if we believe in it, a recommendation that we know is the very best for the construction of vitrified brick pavements, then we shall have accomplished the greatest and best work that we have before us. The brick that Mr. Grimes has used in Terre Haute are the Canton, O., brick, the Wabash Clay Company's brick (the brick I spoke of as having been down for six or seven years were manufactured by the Wabash Clay Company), the Clinton brick and our own brick, and our city has never paid one penny for repairs, and it is not likely to. I suppose we will all be dead before we have to pay out a cent for repairs in Terre Haute. There is just one piece of asphalt street in Terre Haute. Before we began to realize what brick streets would do we put down an asphalt street. It has only been down about six years, and it has had to be repaired constantly. It had to be resurfaced recently, and it cost $1.25 a square yard. We build our very best brick streets for $1.50 a square yard. I heard Mr. Grimes say to a prominent paving brick manufacturer in this country, and he is in this Convention to-day, who, after having seen Mr. Grimes's construction, complained of what he was getting in the cities where he furnished brick: "I can go to your city and take up your brick, that are almost worn out by poor construction, and I will turn them over, the other side up, and make you a first-class street." Now, Mr. Grimes can do that, and there is no reason why that kind of construction cannot be maintained from one end of this land to the other, and I do hope that some action will be taken by this Convention which will look to the adoption of recommendations made in that paper for the construction of brick pavements in this country, and let it have the force of the influence of the brickmakers of this country as being the very best way to construct a vitrified brick street. I will not take your time any longer. (Loud applause.)

Mr. Tiffany: I understood from the paper that the hollow sound was produced by the expansion of the roadbed, the brick resting upon the curbing. Now, it strikes me that it is simply impossible to construct a skew back for the curb that would stand that amount of strain. I would not have mentioned this, for I think that paper is almost beyond criticism, but I thought this might occur to others. I believe that the rumbling sound is owing to the fact that the roadbed is not of uniform solidity. From some reason or another there has been a settlement. I think pains should be taken to have the roadbed uniform. When we first began to make brick pavements we seemed to make a lighter substructure or lighter foundation than they would make for a good Belgian pavement. We seemed to think that, for a brick pavement, a little surface of sand would answer. I believe we ought to have as good a foundation for a brick pavement as for a Belgian block pavement.

Mr. Eudaly: I want to say this is one of the best papers I have ever heard read before this Convention, and backed up by the best discussion. I think Mr. Blair, in discussing this paper, did so in the most straightforward way I have ever heard, and I believe it is right along correct lines. Mr. Tiffany is in error, and I think the paper is entirely correct. I know it, because I saw just such a street and examined it with my own eyes, and I know that that noise was caused by the brick not touching the concrete under it, not only in that one spot, but clear across the street, and I know that curb held the pavement up just like a bridge.

Mr. Purington: Mr. Eudaly is evidently a mind reader, and has taken up just what I was going to say. I was sorry to hear Mr. Tiffany make so bad a break; he ought to have known better. I remember being in Indianapolis, some two or three years ago, and we drove over nearly a block of brick pavement that sounded nearly like a drum, and the theory of Mr. Tiffany that a skew back cannot be formed to stand is all wrong. There is no question but that the expansion of the brick street will raise it from the foundation; we have all of us seen it thousands of times.

Mr. Blair: On South Sixth street, in Terre Haute, the pavement was constructed so good, so magnificently good—with the exception that our expansion cushion was not provided—that whenever the expansion of the brick street came something had to give way, and it broke the oolitic curbstone on each side where it could break, and in two or three places; one place I remember particularly was at the intersection of the streets, where there was a granite curb at the corners, and the concrete subwork extended right up to the granite curb; everything on the outside of that street was held in place, and what do you suppose happened? When the expansion came, and the curb did not give back any, the street came right up in the middle and popped like a cannon or an explosion. Something had to give way, and if you do not provide for it well it will cause trouble.

Mr. Purington: Some time ago I arrived at a certain city in Ohio about 2 o'clock in the morning. There were no carriages, and I walked up to the hotel. I walked part way up on one street and the rest of the way on another. I was attracted by the racking noise of a hack going at a rapid rate down the street I was on first. There was a metallic ring you could hear for half a mile. As I crossed over to another street I also met another hack, and there was a dull sound, but none of the resonance noticeable on the first street. In the morning I inquired of the city engineer as to what was the difference in the construction of those two streets, and he said one was a cement filler and the other a sand filler. Now, the same result is obtained with a one-inch cushion on an ordinary concrete foundation. I asked the Mayor here what was the depth of their cushion, and he said one inch. I claim, with Mr. Grimes, that one inch is not enough, for you may get concrete as smooth as you possibly can, and still there will be little particles of gravel or stone sticking up, which prevent the brick from coming into close contact with the foundation, and it is this which produces the resonance that is deleterious to a brick pavement. Two inches of sand, rolled slowly, as described by Mr. Grimes, not only thoroughly beds the brick, but it pushes it up between the interstices of the brick and makes that a solid cushion. Whereas, in the other way, anyone who makes an examination tion will see that, with a one-inch sand cushion, the majority of the interstices at the bottom of the brick are not filled at all. I suppose I may as well confess that I am the

C. McDermott, Wellington, O.

gentleman who Mr. Blair used as the temperance lecturer uses the drunkard, to whom Mr. Grimes made that proposition to take up our worn brick and turn them over and make a street practically as good as new. For two or three years a friend of mine has tried to get me to go to Terre Haute and see the brick pavements there. Last summer I went down there and spent one afternoon with Mr. Blair and Mr. Grimes, going over the streets of Terre Haute and making examinations. What I saw there was a revelation to me. It was not the quality of the brick, but it was the manner in which the streets were constructed. I was so impressed with the streets of Terre Haute that when I went back to Chicago I wrote a letter to the Commissioner of Public Works, telling what I had seen, and I said: "If you will select two men to go to Terre Haute and make an examination of the streets there, and then if, on their return, they will say what I expect they will say, I will, at my own expense, construct two streets here, provided you will agree, if I am correct, that you will have the specifications changed to conform to those governing the construction of Mr. Grimes's streets." He wrote me a courteous letter, saying he had referred my letter to the superintendent of streets, and thanked me, and I have heard nothing from it since. I am with Mr. Grimes and Mr Blair and everybody else looking to the better construction of streets, and I do not like to say what I think is true—that some of the best streets in Terre Haute were constructed of the poorest brick. The only thing I am afraid of is that if we construct our streets so good we will lower the quality of our brick.

Mr. Blair: We have just as good brick there as they have in the world. (Laughter.)

Mr. Purington: I do not know that the paper brings out one point that impressed itself upon me at Terre Haute. The Canton "cull" brick used in the streets alluded to by Mr. Blair were not such brick as we would cull out. I think Mr. Grimes had the best of it. I think they took out the best of the brick for culls. I do not think they knew enough about it to pick out the poor brick from the good ones. The brick streets constructed by Mr. Grimes are as smooth as asphalt and much more durable.

President Gates: We would like to hear a few words from the Mayor.

Mayor Maybury: Mr. President and Gentlemen, I want to express my personal thanks, as well as those of my associates, for having been permitted to listen to the most delightful discussion on this subject that it has ever been my pleasure to listen to. The papers read have all been excellent, but I, of course, was more interested in the last one, by Mr. Grimes, and which was read with proper emphasis and by a good reader. I think, gentlemen, that the paper and discussions have brought up matters that are certainly new to us in the construction of any pavement that we know anything about. Take the asphalt and cedar block, which are the prevailing pavements here, in connection with the brick. There has been a great deal of discussion about asphalt, the composition of it and the laying of it, and how far climate affects it, and there has been a great deal of discussion about

CHARLES T. HARRIS, Alfred, N. Y.

cedar block, the time they are cut and dried and how they are laid in the street, but we have confined our talk too much to the brick themselves and too little upon the general surroundings. (Applause.) I know we had quite a lively time here, as you might say, something like a year ago, in the testing of brick, and perhaps some of you gentlemen were interested. I see one gentleman here to-day who was interested at that time as to whether we should or should not adopt brick pavements. I am entirely satisfied, from the discussion I have heard this morning, that with brick, as with any other pavements, we must depend upon a great many things, from the foundation to the completion of the street. You have perhaps observed that we have an unusual number of brick streets here where the brick seem to chip; in fact, those that do not are rather an exception. There are some brick that seem to stand the chipping test, so far as the wear is concerned, better than others. Now, an ordinary observer like myself would say, "Well, the brick are defective," and perhaps this may be an injustice; it may be that the filler or cushion, that seems to play so important a part, was not what it should be. One of my commissioners, when he heard that paper, shook his head and said, "Two inches is too much; one inch is better." I said to him, "What would be the effect of a two-inch sand cushion as against one?" and he said, "It would cause the tipping of the brick." Now, I feel this is a question to which we have not given sufficient attention. I have not heard discussed here this morning (perhaps it is not pertinent) as to how climate affects brick differently made, differently dried, differently burned, as to whether this factory does a certain thing and another does not; perhaps they are not pertinent, as I have said; I do not know. There are some places in this country where I am satisfied that the cedar block pavement is not satisfactory, but—

Mr. Ittner: The brick pavement is an exception; it is satisfactory everywhere. (Laughter.)

Mayor Maybury: Well, it may be so. I do not know anything about that. Now, as to the noise. Of course, upon residence streets particularly, there is some objection raised as to the rumbling of the wheels and the sound of the horses' hoofs as they pass over the streets. I notice, upon some streets, that the noise is very much less than it is upon others. Whether due to the integrity of the brick or to the cushion, of course, I do not know. There is a brick laid here upon a little street, for a distance of about four blocks, and it has a very heavy traffic passing over it. It was laid some five or six years ago, before I had any special reason to have my attention called to such matters. The brick are about six inches square, more like a tile on top, and have grooves running edgewise, and run down into a sort of a hollow block, into which the sand is put for the purpose of deadening sound, and it seems to have accomplished its purpose very well, and in every respect the pavement seems to stand well. But the board speaks of the expense as being far beyond what we can afford to pay, especially under present circumstances.

I desire to express my pleasure and gratitude at being able to be with you, and gratitude at being able to hear this discussion. Now, I noticed when the pitcher of water came in a little while ago there was a general smile, and there was a suggestion by some one that we ought to put a little milk in it. The gentleman was from St. Louis, and I was surprised to hear him make such a suggestion (laughter)—surprised that a man from St. Louis should mix anything. Of course, I understood; I saw very plainly that he was referring to the fact of which I spoke the other day. Water and milk would have been all right, but to have mixed water with such milk would have been a crime (laughter), and would have ruined both. I want you all to come back to Detroit again whenever you want to; whenever you are weary and want to rest, come up and see us. When you have passed from labor to refreshment, and you have been laboring hard this week, like the early people who labored to make brick without straw, remember that you have the right of way here in Detroit. (Loud applause.)

Mr. Ittner: The paper that has been read was very interesting and was listened to with a great deal of pleasure and satisfaction by all of us. I am not engaged in the manufacture of pavers, and do not know that I ever shall be. I have my ideas, and I simply want to reiterate an idea that I have expressed in former Conventions, and that is that brick streets should be laid at an angle of 45 degrees with the curb line. The only brick that I see laid in that way are at the crossings or intersections of streets, as has been mentioned in the paper. Now, if they are laid that way at the intersections of the streets, why could they not be laid that way from one end of the street to the other in the same way? The point I wish to express is this: that in laying the brick at right angles with the curb there is a hammer blow from one brick to another as the wheel passes over them. There is a thud and a concussion, which add to the wear of the material. With a brick laid at an angle of 45 degrees with the curb line, a tire that is one and one-quarter inches wide, and there are few less than that (the wider the tire the better in regard to my argument and my position), before it has passed off of one brick in the one row, will be on the brick in the succeeding or next row, and there you avoid the blow of concussion, or hammer blow. So with the calk of a horse's shoe; there is an improvement there, because the horse's foot, coming right square down, with a hammer blow, will strike on the edge of the brick, and, in my opinion, is apt to damage it more than if it came down on the edge of the brick at a position of 45 degrees with the curb line. I think what I have said on this subject has been sufficiently plain to make my views understood.

President Gates: Those streets at Terre Haute are just about as smooth as they could be, and hence there is no need of putting them at an angle of 45 degrees.

Mr. Dunn: We have quite a number of brick streets in our city, and there is a great deal of noise, and we tried laying one square at an angle of 45 degrees, and it is a success. There is less noise and no tipping of the brick, as in the other streets.

Mr. Pike: I want to ask Mr. Blair in regard to that explosion he spoke of. What was the expansion? That is, how high did the street raise before the explosion occurred?

Mr. Blair: That is impossible to answer. It was noticed coming up slowly, and by careful observers it was supposed

to be about fourteen inches in the center before the explosion took place. When you go farther than that, you know, it gets into the theoretical lines and I am lost. It was supposed that the air was heated to a certain degree underneath, and thus some gases were formed which aided in the explosion.

Mr. Eggers: In Cleveland I have observed that on the paved streets there is a raise of two to two and one-half inches along the street-car tracks, so it shows there is quite an expansion. In Cleveland they do not give us a concrete bedding at all. We have a good clay subsoil there, on which we put from two to three inches of sand bedding or sand cushion, and I want to say we have some streets there, paved in this way, that have been down for the last ten or twelve years, and they are in very good condition; but the fault with us is that we are not particular enough about our construction. Indeed, we are not particular enough in any respect. On one street, where the brick were shipped in from some little town, 50 per cent. of them were condemned. Mr. Randall was with me one Sunday and we looked at that street, and I told him they ought to have condemned the other 50 per cent. I think this idea of Mr. Grimes to put tar between the brick pavement and the curb is a good one, and that it will answer the purpose and give room for expansion, because the tar is elastic. We had some brick streets on which a tar filler was used, and we could see it running over the streets in hot weather in the summertime. Of late years we have used nothing but the cement filler, the very best filler we can get. Some one has spoken about the inspection of brick. I was coming along one of our streets some time since, and there was an inspector culling out a lot of brick, and I said, "What is the matter with those brick?" He said, "They are no good." I said, "Why, they are the best brick you have in the street," and he said, "I do not think so." "What is the matter with them?" I asked, and he answered, "They are off color." The fact was he was culling out the nicest cherry red brick, about the color of that bell on the table. When they get the ward healers and politicians for inspectors they make a mistake. As I have often said to our Board of Public Works, "We must get good men who understand these things, and then we will get good work." The main thing is to have a good inspector, and the point that has been brought out this morning that the brick could be inspected at the factory is a good one. We sent our inspector down to Canton, and he inspected the brick there. We had one corrupt inspector, but that was the fault of the paving brick manufacturer. After the brick were made he should have seen to it that none but good brick were shipped, and to-day those people would have been better off. (Applause.)

Mr. Eudaly: I want to say a word right here to correct a wrong impression that may get out and lead to a wrong conclusion by those who read our reports, and that is in regard to the expansion of the brick pavements, whereby the street is raised from the foundation. This is not a fault of brick alone, but the same will occur with asphalt streets or cedar block streets, or any kind of pavements that are put down, where the pavement is brought in close contact with the curb. The same thing occurs with asphalt, it occurs with a cement pavement, it will occur with any pavement; so it is not peculiar alone to brick, and the very fact that it is so noticeable in brick ought to be construed, and will undoubtedly be construed, by any scientist as a very great recommendation for brick. There is no doubt about it. I haven't time to say why I believe it is so, but just investigate and you will find that the very thing that is noticeable is a good recommendation for the brick.

Secretary Randall: I want to take the liberty of asking a gentleman who is here as the guest of our Association to say a few words to us on this subject. He is an engineer of repute —Prof. A. N. Talbot, of Champaign, Ill. (Applause.)

Mr. Talbot: I did not expect to say anything this morning, but I have been very much interested in this discussion, and I am very glad the brick manufacturers of the country are manifesting such interest in the proper construction of brick pavements. I have long felt that a great defect in brick pavements lies in the method of putting down the pavement. All of the items you have discussed here to-day are of importance, and if this great body can impress upon the people and the cities of this country the importance of doing good work it will certainly have accomplished great results. On the matter of the depth of the layer of sand, I will say my practice has been something between the two, the layer of sand to be such as shall become one and one-half inches after brick are rolled, which corresponds to one and three-quarters or two inches of thickness before the brick are rolled. The objection to too thick a layer of sand lies in the fact that the different parts of this layer may not have the same density, and upon rolling some parts will be compressed more than others, and so the surface will not be entirely smooth. There will be an uneven surface if great care is not taken. I have seen cases where workmen in dragging the template along tramped over the surface of the sand, and this left a ridge along the surface of the pavement. Great care must be taken that the moisture of the sand shall be as uniform as possible. Of course, if the sand is all dry, so much the better, but as the sand is usually found, some of it is wetter and some dryer, and some of it packs down and some of it does not, and one of the reasons that some pavements are so uneven after traffic comes on is that the sand is not of uniform consistency. As to expansion, I have felt that the method used in Terre Haute of putting a tar filler along next to the curb line was an excellent one, and I believe that if made wide enough it will be of advantage in reducing the amount of noise. As said by Mr. Purington, pavements having a sand filler do not have the noise accompanying those having a cement filler, a result which is due to the fact that the sand is mixed with the loam on the street, and is more compressible, and that the layer of brick as it expands will compress the filler between. (Applause.)

Mr. Blair: I do not want it to go out from this Convention that the fact that a brick pavement expands is in any sense a criticism upon brick pavements. I do not want that to go to the public at all, because my experience with the expansion in brick pavements is that it is the only kind of a pavement that may be allowed to expand with little or no injury, and the only one in which expansion can be perfectly provided for. The expansion in an asphalt pavement will ruin it; in the creosote block pavement it disturbs every block in the pavement. In the brick pavement we can provide for it at the sides, and there is not a brick disturbed, and cannot be.

W. G. Titcomb, Providence, R. I.

Mr. D. V. Purington: I do not want to be outdone by Mr. Randall, and I want to introduce Mr. W. K. Eldridge, the City Engineer of Lafayette, Ind., who, I am sure, can give us something interesting.

Mr. W. K. Eldridge: I feel very much honored that a person belonging to the class considered the natural enemy of the brick manufacturers should be called upon to speak in this Convention, but I will take occasion to state that the enmity is not all upon our side. The discussions have been very interesting, and I feel free to say they have been handled in a manner that would do credit to an engineering convention. The matter of the expansion of brick pavements has been pretty thoroughly canvassed. Mr. Grimes's paper spoke of the expansion being compensated for by the expansion joints next to the curb line, but he has made no allowance for the longitudinal expansion of the pavement, which, of course, is much greater than the transverse expansion, and may be provided for by cross-expansion joints of some elastic material at certain intervals. In regard to the rumbling of the pavement, engineers are pretty well agreed that this is often caused by the shrinkage of the concrete, which is covered with the sand cushion. A brick pavement is laid on the concrete a few days after the concrete has set, but the concrete goes on shrinking for several months, whereby, at

places, there probably occurs a slight opening between the sand surface and the brick, which is perhaps no thicker than a sheet of paper, but sufficient to cause this resonance complained of. This occurs at all seasons, winter as well as summer, which indicates that it is not due to expansion of the brickwork. In my city we have never used cement fillers, and have never had any trouble with the brick pavements from rumbling or expansion or upheavals. In case of shrinkage of the concrete, the pavement should be allowed to settle upon the foundation, whereby no space is left to cause the rumbling.

Mr. Eudaly: I rise for the purpose of making a motion. I believe we are on the right track and going quite rapidly, and I move that a committee of three be appointed to investigate the best methods of brick street construction, and prepare a recommendation (or report progress, as they may deem best) for the purpose of determining the best construction for brick streets, and submit their conclusions for the approval of this Association at our next Annual Convention. In this connection I want it understood that I am not to be appointed on this committee.

Mr. Ittner: I will second the motion with a view of saying a few words upon it. It is a new proposition to me, but I do not think it best for us to do it, and, as one of our "natural enemies" is here and has spoken, I am disposed to believe that this comes under the domain of "our natural enemies." I believe we ought to leave the proper construction of street pavements to the engineers of this country. I do not believe we ought to be previous in our proceedings, or that we ought to take up anything that does not legitimately belong to us. I think we are justified in doing what we have done with reference to a proper method of testing paving brick, and in

T. D. Potter, Springfield, Mass.

our discussions here we have the right to express our opinions upon the subject of construction of brick pavements. But I think that the proper method of constructing brick pavements or any other kind of pavements legitimately belongs to the engineers of the different cities of this country. For myself, I do not favor the resolution at this time.

Prof. Orton: I am in favor of the general idea that Mr. Eudaly has suggested, but I agree with Mr. Ittner also, in part, that it does not exactly fall to the normal place of this Association to undertake to settle this matter. I think that—

Mr. Eudaly: I do not want to interrupt, but I have made no such proposition as has been spoken of. My motion was that a committee be appointed to investigate this matter and report to the next Convention.

Prof. Orton: I think my original conception of Mr. Eudaly's motion is correct. The natural result or natural tendency of such a committee as he asks to have appointed would be to arrive at some definite conclusion as to how the brick should be laid. As soon as we have definite conclusions it should be our aim to see that streets are laid that way. I believe, however, that it would be better for this Association to try to get the engineers of this country—the constructive engineers—to appoint such a committee, on which we should have a minority membership. If the American Society of Civil Engineers will appoint a committee of seven and accord the appointment of two of the members to this Association, who can represent our point of view as brick manufacturers, we would be sure of fair play.

Mr. Yates: We have a friend in camp on this side of the house, a little bit modest, but he has been hunting up some data on the subject of construction, which I think will be interesting. I refer to Mr. James Breed, of Syracuse.

Mr. Breed: I must say that I approve of the paper that has been read upon the construction of brick pavements, but must take some exceptions. I am a manufacturer of vitrified paving brick, and have charge of the selling, and also have to put down the brick pavements. I have had brought up against brick pavements, in my arguments for them, the noise made by vehicles in passing over the pavements, and I have made a great study of that, and at one time I agreed with the young man who has given this theory, but I have changed my opinion. I am not going to take up much of your time. I am nothing more than a business man, and when a man advances a theory I want a practical proof, and I will submit a proof from one of the most expert engineers in New York city, and I will ask the Secretary to read it. There is not a man here who is acquainted with cement and has handled it but must agree with me that cement six inches thick will shrink if it is not properly handled. Now, this foundation is made of broken stone, sand and cement; it is put upon the streets and is handled by two gangs of men, and in some portions of that cement, and in certain patches, they put in more water than they do in others, therefore there must be more shrinkage. I have found that that cement must stand from ten to fifteen days before there is a brick put upon it. Where such is the case there will be no rumbling. We have known instances where rumbling occurred on one side of the street for a few feet only, and then would occur again farther on across on the other side of the street, the intervening pavement being free from the trouble. This, I think, shows that the trouble is due to unequal shrinkage of the foundation, caused by putting too much water in one batch of cement and not enough in another. In order to prevent that you should have each batch made properly, putting in the same amount of water, and then give the cement a proper time to set before the brick are put on it, and then you will have none of the rumbling noise. With your permission I will submit this report to the Secretary and ask him to read it. (Applause.)

Mr. F. L. Breed, General Manager New York Brick and Paving Co., Syracuse, N. Y.:

Dear Sir—Herewith please find certain facts in regard to the attempt made by me to determine whether there was an appreciable shrinkage in concrete used for pavement foundation six inches in thickness.

The elevations were taken as noted and equal fore and back sights used. The first three points were taken on spikes driven flush with the concrete, and not extending through the same. Three points across the roadway were taken for the first series, and at the end of seven days the shrinkage on these points was apparently .003, .004 and .005 respectively. Another set of three points was made by bedding flat stones in concrete so the top was just flush and fair with the concrete surface. One of these points was disturbed, but the tests on the others showed an apparent shrinkage of .006 and .008 at the end of nineteen days. Test No. 3 was made on flat stones imbedded as described, and the result on three stones showed 0.000 shrinkage, 0.001 shrinkage and 0.001 shrinkage at the end of fifteen days.

These points were set while the concrete was fresh and soft, and in the usual condition found on contract work. The cement used for the concrete was Hoffman's, and the stone machine-broken limestone.

Proportions, one, two and four. If you can draw any conclusions from the foregoing you have the facts to work upon. Respectfully, S. C. THOMPSON, P. A. E.

New York City, Feb. 3, 1900.

Prof. A. N. Talbot: May I be allowed to make one suggestion. The American Society of Civil Engineers is a very conservative body, and especially is it conservative in regard to appointing standing committees, and I doubt if you could get them to appoint a committee for this purpose. They have never appointed but one or two standing committees. One was the committee on standard time, and the other was on the standard methods of testing structural materials; but more recently several attempts to get such committees appointed have been opposed to such an extent that I doubt if you could get them to appoint such a committee as you suggest. It seems to me that it might be better, instead of taking it before the American Society of Civil Engineers, to ask the co-operation of the American Society of Municipal Improvements, a body which includes in its membership all the city engineers and public officials of the principal cities

of the United States. I think they would gladly take the matter up.

Mr. Eldridge: I am a member of the American Society of Municipal Improvements, and I believe this idea would receive favorable consideration, as the president of that body is an enthusiastic advocate of brick pavements, and you will get all the help you want.

Mr. Bloomfield: I have listened to the remarks on this subject with much interest. It is an important matter, and as we can scarcely give it the attention it deserves now, during the closing hours of this Convention, I move that the President be authorized to appoint a committee of three to consider the most approved methods of constructing brick pavements, and submit specifications for same; that the committee be instructed to confer with a similar committee representing the American Society of Municipal Improvements, if this body will co-operate with us, and make a joint report, if it can be so arranged, at our next annual meeting. I offer this as a substitute for Mr. Eudaly's motion.

The motion was seconded by Mr. Yates and carried.

Secretary Randall: The next in order is the report of the Committee on Technical Investigation, by Prof. Edward Orton, jr.

(Prof. Orton gave in detail the result of the experimental work, illustrating the same by a series of charts, all of which will be submitted in book form in due time.)

W. D. Richardson: A few months ago, when this matter came to my knowledge, and we found we had such a valuable test, I realized that it ought to be brought before this Convention, and I also realized that most of us who would sit and listen to it would not have time to form an intelligent conclusion, as most of us are not experts, so it was thought best to have this referred to a special committee of men who were experts in this line, so that we would have full confidence as a body in this report. After consulting with the Executive Committee it was decided to appoint such a committee, and I have here the report which they have made. I feel satisfied that we have done the right thing in having these tests examined by a special committee, and take pleasure in reading their report.

REPORT OF COMMITTEE ON PROF. ORTON'S INVESTIGATIONS OF STANDARD METHODS OF TESTING PAVING BRICK.

The committee consisted of:

J. L. Higley, brick manufacturer, Canton, O.
D. V. Purington, brick manufacturer, Chicago, Ill.
Prof. Edward Orton, jr., Columbus, O.
Prof. A. N. Talbot, Champaign, Ill.
Gomer Jones, civil engineer, Geneva, N. Y.
H. A. Wheeler, mining engineer, St. Louis, Mo.
Prof. J. B. Johnson, Madison, Wis.

This committee met at the Auditorium Hotel, Chicago, at 10 a. m., Jan. 27, 1900, and organized by electing J. B. Johnson chairman and A. N. Talbot secretary.

There were also present by invitation Prof. W. K. Hatt, of Lafayette, Ind.; Mr. C. C. Barr, of Streator, Ill.; W. S. Purington, of Galesburg, Ill., and W. D. Gates, terra cotta manufacturer, Chicago.

Prof. Orton presented in great detail the results of an elaborate series of tests by three methods, namely:

1. The present N. B. M. A. standard test.
2. The University of Illinois standard test.
3. The Jones standard test.

Prof. Orton had first standardized both the University of Illinois test and the Jones test, and then compared the results as obtained from the three different tests.

The University of Illinois test, devised by Prof. Talbot, differs from the N. B. M. A. test in placing a certain number of bricks in the standard N. B. M. A. rattler, along with cast-iron shot of two sizes, the larger weighing about seven and one-half pounds, and the smaller about one pound.

The Jones test consists in fastening the brick edgewise around upon the inside surface of a cylinder rattler and using one and one-half-inch cubes of cast iron for the impact and abrading material.

In a general way the committee have found that while the Jones device gives more accordant or uniform results for any given make of brick, and while it is distinctly more sensitive in indicating the softer grades of brick, the device as now manufactured embodies objectionable features which the committee think can be remedied.

As between the present standard N. B. M. A. test and the University of Illinois standard test the committee find that the latter is more sensitive in selecting the soft brick, and also gives much more uniform results than the present standard.

No details of these experiments are given here in view of the presentation to be made by Prof. Orton of a complete report of the same to the N. B. M. A. at its coming meeting.

The committee feel that they will have discharged their duties by advising the Association as follows:

1. Abandon the present N. B. M. A. standard test.
2. Adopt in its place the University of Illinois standard test as described below.
3. Authorize Prof. Orton and Mr. Jones to proceed to make such changes in the Jones device as have been proposed by the committee, and then let Prof. Orton proceed with further tests of the same and report his findings either to the Association directly or to a committee appointed by it, as has been done in this instance. Mr. Jones agrees not to take out a patent upon his rattler, so that when perfected it will be public property.

In this way we believe a thoroughly satfactory standard test will be evolved which will be perfectly fair to the manufacturer and will effectually discriminate between paving bricks of different wearing qualities.

The committee has expressed its high appreciation of the work done by Prof. Orton in these tests, and of the debt which all users and manufacturers of paving brick owe him in this matter.

The standard test which the committee now propose to be employed until a better one can be found is as follows:

1. All brick should be thoroughly dried before testing in the rattler.
2. That the present standard rattler, twenty-eight inches in diameter and twenty inches long, be retained. It is preferably made of steel plates in place of cast iron, as cast iron peals and ultimately breaks under the wearing action on the inside. That the rattler be run not less than twenty-eight nor more than thirty revolutions per minute for eighteen hundred revolutions.
3. That the charge to be placed in the rattler consist of nine paving blocks or twelve paving bricks, together with three hundred pounds of shot made of ordinary machinery cast iron. That this shot shall be of two sizes; the larger size to weigh about seven and one-half pounds, and to be two and one-half inches square and four and one-half inches long, with slightly rounded edges; the smaller size to be cubes, one and one-half inches on a side, with rounded edges. Further, that the individual pieces of cast iron shall be replaced by new ones when they have lost one-tenth of their original weight. The short charge to be always composed of one-fourth (seventy-five pounds) of the large cast iron blocks, and three-fourths (two hundred and twenty-five pounds) of the small cast iron blocks.

EDWARD ORTON JR., Columbus, O.

A. N. Talbot, Secretary Committee.
J. B. JOHNSON, Chairman Committee.

Mr. Eudaly: I move that we approve the appointing of this special committee by the President, and that we adopt the work of Prof. Orton and his committee as the work of this Association, and that the report of the special committee be adopted.

This motion was seconded by Mr. Bloomfield and carried.

Adjourned.

FIFTH SESSION.

Friday, 2:30 p. m., Feb. 9, 1900.

President Gates: The Convention will come to order. We were not able to complete our programme of the morning session, and the first thing this afternoon will be the report of the Committee on Technical Investigation, which Mr. D. V. Purington will read.

REPORT OF THE COMMITTEE ON TECHNICAL INVESTIGATION.

To the Officers and Members of the Association:

Gentlemen—In 1898 the Association voted to undertake an investigation on the subject of the influence of the process of manufacture on the resistance of clay wares to frost. This work was to be carried on by the N. B. M. A. and a scholarship in the department of clayworking and ceramics of the Ohio State University, and Mr. R. C. Purdy was appointed to execute the work under the direction of Prof. Orton.

He pursued this investigation for a year with great vigor and interest, but at the end of the year there still remained a great deal of work to be done in order to conclude the experiments already undertaken. Your committee acted on the advice of Prof. Orton, and appointed Mr. William Cannan to complete this work, as he was on the ground already and familiar with the work which Mr. Purdy had begun, and could therefore finish it with little or no loss of efficiency by the transfer.

Mr. Cannan was ready, therefore, at the beginning of the school year to begin his work, and the expectation was that this work would be finished in time to report the complete results to this Convention.

The following circumstances has interfered with the prosecution of this work. At the Thirteenth Convention there was formed a committee of some fifteen paving-brick makers, who undertook to make a comparison between the Jones process of testing paving brick and the standard process of this Association. This committee asked Prof. Orton to take charge of the work for them, to which he agreed. They then raised some money, bought a Jones machine, sent large samples of brick to Columbus for test, including those made from different materials, by different processes, and burned to the different degrees of hardness.

This work was begun in April, 1899, and was carried on until

W. S. RAVENSCROFT, Ridgway, Pa.

June 15, 1899, and then ceased until the reopening of the university in September, which made it possible to go on with it. Mr. Cannan was employed to do this work in the beginning, and proved extremely efficient.

When the time came to resume work, in the middle of September, the situation was as follows: The regular scholarship work and the paving brick test work were both partly completed, and Mr. Cannan was the only available assistant who was familiar with both investigations and competent to carry either of them forward.

Prof. Orton took the responsibility of carrying on the paving brick testing work, and using Mr. Cannan's time in that field, thinking that he would be able to finish this task much sooner than he could do the scholarship work, and that he could thus complete the more pressing obligation first, and still finish the scholarship work with reasonable promptitude.

This he has not been able to do, however, and he has only completed the paving brick test about three weeks ago, by unusual exertion, so that while the original test proposed by the paving-brick makers has been fully and thoroughly completed the scholarship work still stands in "statu quo."

On completion of this paving brick task Prof. Orton asked that a committee of experts in such matters be appointed by the N. B. M. A. to revise his work, and thus give it more weight before the engineers of the country than if presented as the work of one man only, or as the work done by a committee of paving brick manufacturers only. The President and executive committee concurred in the importance of this being done, and appointed a committee of seven, who met in Chicago on Jan. 26, and whose report will be submitted at this Convention.

The money raised by the paving brick manufacturers was not found to be sufficient for the work, and a deficit of $75 to $100 was created before the end of the test.

The finding of the committee which met at Chicago now makes it clear that this Association is responsible for a standard test, which, while it was the best in existence when it was framed and adopted three years ago, has been rendered obsolete by progress since that time. The Association, therefore, is in the position of being obliged to alter its specifications for the standard test, and to go forward in this work or fall into contempt among the engineers and paving brick consumers of this country.

Your committee, therefore, presents the following recommendations to the Association, hoping that they may be approved:

First—That the substitution of the paving brick tests for the regularly adopted scholarship work, under the urgent conditions above cited, be here approved.

Second—That the Association shall acquire all right and title to the work begun by the paving-brick makers, and for which they have spent about $350 by paying the deficit, amounting to not more than $100, from the scholarship appropriation made at the thirteenth Convention.

Third—That the Association shall take up and complete the work of securing a thoroughly satisfactory method of test along the lines recommended by the conference committee who met at Chicago.

Fourth—That the further prosecution of this work be carried on under the direction of your committee on technical investigation, and that it shall constitute the subject of investigation under the regular terms of the scholarship until finally completed.

Fifth—That on its conclusion the work of the freezing test, which can stand without detriment, shall be resumed and completed.

Sixth—That any extra expenditure over the regular annual appropriation for the scholarship needed to carry out the construction of an experimental rattler, shall be submitted to the executive committee of this Association before any such expenses are incurred.

Seventh—That the executive committee shall be empowered to appropriate money for this purpose, but that they are requested to make an effort to raise any money required by subscription from sources outside of the regular revenues of the Association.

Respectfully submitted,

D. V. PURINGTON,
W. D. RICHARDSON,
ANTHONY ITTNER,
CHARLES A. BLOOMFIELD,
EDWARD ORTON, Jr.,
Committee.

Mr. F. Plumb: I move that the report be adopted.

The motion was seconded by Mr. Pike and carried.

Secretary Randall: The next in order is a paper on "Kiln Experiences," by T. C. Lundy, Farmingdale, L. I.

KILN EXPERIENCES.

By T. C. Lundy.

Mr. President and Gentlemen of the Convention:

The subject given me by our Secretary for a paper is one that, properly written, would fill volumes. Undoubtedly most of you gentlemen before me have had kiln experiences. Let me see. If the camera could have been brought into requisition at certain times in your history of kiln results I imagine you would scarcely recognize yourselves. Your face might be so distorted by the shocks you would receive at the opening of some kilns it would scarcely be safe for your wife to ask you even for a dollar, or your face might be so much changed by such a happy broad smile that it might not be healthy for the company if your burner should at that moment ask for a raise in his salary.

Gentlemen, have you ever been shocked or pleased at the opening of a kiln of brick? To look at you all here to-day one would imagine your experiences were on the happy side of kiln openings, and yet I would not be surprised at times in your handling of kilns it would take more than report of twins to make you smile.

In this paper I shall endeavor to lay before you some of the difficulties encountered in handling kilns, together with their causes and remedies. I have taken the trouble to present for consideration samples showing effects. We have heard more or less talk about freaks. What is a freak? Webster defines it as a sudden causeless change. This being the case, do we have freaks in kiln products, or is it a result of violating natural laws? Let us look into this matter carefully and see if by investigation we can possibly ascertain a cause for the results we sometimes get. Just let us go back over our work for the year. Can you recall that during the dry, hot summer months you had little or no trouble with the so-called freaks? Then, if that is a fact, and I think all practical brickmakers will agree that they experience little or no trouble during the hot, dry summer, unless your night burner should drop off for a doze now and then, we have at least found a key for the difficulty. Now for the cause.

First, in the cold, damp winter months the more rain, and snows that frequently melt, add to your trouble by causing your kiln

walls, flues, tunnels, etc., to become damp, and, as is frequently the case, your kiln roof empties its waters between or about your kilns, and thence down into your flues. Your turntables in front of your kilns are a receptacle for water to be given out in evaporation to your wares through your kiln walls. All these simply prevent a sufficient draft to carry of your gases. The result is stained or fire marked brick. I claim dampness is the greatest difficulty we have to contend with, and causes three-fourths of the whole discoloration of front brick. For instance, if we use green wood it leaves a stain; if we water smoke too rapidly it leaves a stain or flash. Why do these produce such results? Simply because it prevents proper draft there by improper combustion of the fuel. You cannot carry off the gases which accumulate, and these, by attacking the different elements in your clay, produce what are commonly called freaks. This only establishes the fact that we must observe the natural laws to prevent freaks. If you will go back, in the spring and fall more particularly, you discover an odor of sulphur escaping with your water smoke. Rest assured you are making freaks. Remember you are pushing that kiln too fast for perfect face brick. Simply the dampness is produced by boiling the water in your brick instead of evaporating the moisture below the boiling point. The color is certainly changing on the face of your brick. Of course the dampness of kilns, flues, etc., is assisting you in your work of freaks. But there is a remarkable difference in clays taking heat. Some clays will water smoke safely in thirty-six hours, others will require sixty hours. This you will have to learn by experience.

If your kilns and flues are perfectly dry, and you give your goods plenty of time during water smoking, only moving your fires gradually along, all this odor would be conspicuous by its absence. All this shows that in order to get perfect results the kilns and flues must be perfectly dry. By having your kilns and flues clear and a good smoke stack and plenty of time in water smoking you will have little difficulty with freaks. Again, of course you must have a kiln properly constructed. No man can make a No. 1 burn consecutively in a kiln which is not properly built. Men are often censured for a poor burn when it would simply be impossible for any man to do better. I had a case of this kind once. I burned eighteen days on a kiln of pavers, and then it was not satisfactory. My burner told me they always burned on that kiln from fifteen to eighteen days. I made some changes in the flues and on the bottom of the kiln. From that time on we could get good burns in nine days.

A man may have a good kiln, but if he does not understand burning properly it will only be a hit and miss affair with him. You must regulate your dampers until you get the proper draft for the coal you are using. Some require more than others. Too much draft is almost as injurious as not enough.

You must retain and accumulate heat in order to properly burn the bottom of your kiln. Please note if by heavy firing you do not get your boxes and top of your kiln hot you can be sure you have too much draft, or you are admitting too much air. If your boxes and top remain hot you will know you have not enough draft. This may be caused by the flues becoming filled up or by dampness, or by both. All flues should be examined after each burn, a point which so many loose sight of. If you hold your heat on the top your results will not be as uniform as if you were to settle from top to bottom. Too much draft with the admission of too much air through boxes will, in some clays, cause the brick to give out a dead ring; not the clear metallic ring so much desired.

Now about your flash wall. If you allow your walls to become uneven at some points, say nine-inch openings, at others twelve-inch, etc., you cannot possibly hold your heat uniform through your kilns. Your heat will seek the greater opening as a more ready exit.

I have been frequently asked how I get my heat out to the heads of my kiln. First, in setting I leave flues at each head and each side, say, back one bench from the head, then I hold my dampers closer into the center of the kiln, thereby driving my heat to the heads, and always take time enough to properly water smoke all the brick before raising my fires. I have drawn kiln after kiln with less than one hundred soft brick in a kiln of one hundred and fifty thousand.

Now let us go over the water smoking a little. When you see the heat coming down through the center peephole watch it closely. If it is a clear, glossy brown your work has been well done. If there are black spots here and there drop your damper a little and go slow. You are going too fast; your kiln is not ready or your goods have been injured in your dryer, and will not take the heat readily. If after passing the center peep you watch at the bottom peep, and the heat shows first at the head and then gradually works its day to the center of your kiln, with a glossy brown color leading the red, you need have no fear of not properly burning that kiln, provided you finish carefully. The heads should be kept in the lead a little until nearly the finish of your kiln. But when you see those black spots look out, for the bell is ringing as loudly as possibly for you to stop and wait awhile. Give it a chance, or the doom of those brick, as to color, will be forever sealed. I have not the least doubt but that many of you have seen these black spots at the bottom of down-draft and at the top of up-draft kilns, even when you have finished the kiln. These bricks have become enveloped in soot, which, being of a very cold nature, prevents the escape of moisture from the brick, and a battle between the heat and cold takes place, generally to the success of the cold by the heat sliding off to a more ready exit. Your burner tells you he cannot get those spots. Of course he can't, because he has lost his opportunity while water smoking that kiln. He probably does not know it, but it is positively the fact. Had the kiln been allowed the proper time in water smoking he would never have had to tell you he could not get them unless the brick were injured in the dryer. Therefore, when you hear the bell ring go slow for a time. Listen to its warning.

Now, gentlemen, a few more signs. If you find either broken brick on the bottom or checked brick on the top of your down-draft kilns your man has either taken a nap or he has water smoked to fast, more particularly after a nap.

You may not think your men take a nap during the night. I did not until I heard the bell ring and ring again. Then I listened. I watched and found too much hard cider had been in use. I also found a man whose condition I would call too full, if I may use the expression, to be successful as a burner. I sent for my day burner, excused my night man, and next day paid him off. From that time on I had no trouble with my burning.

I will show you some of the results of too much hard cider. Now, gentlemen, let me suggest a remedy. Put an electric system in your plant, with, say four buttons on each kiln. When your burner, day or night, attends to his fires, either in water smoking or burning, have him touch the bottom. You will then

T. C. LUNDY, Farmingdale, L. I.

have five records at each circuit of the kiln. A comparison between your night and day burner will thus be established, thereby forming a guide for you.

Have your engine room summarily equipped, with the dial in your office recording every move your burner and engineer make. Such things have occurred as the one man doing the work of both or partly doing it, allowing the one to take a nap at the expense of freaks in your kiln, and possibly in your dryer. If the electrician would offer us at a reasonable price a device that would give us every moment's record of the heat in the dryer and steam in the boiler room, day and night, it would be to the dry press brickmaker a very valuable help. I trust it will not be many years before a perfect system by electricity or otherwise will be attached to all kilns, recording the exact heat by minutes and hours in the different parts of the kiln, the value of which will be apparent to all.

Appearances are very often deceiving, and in nothing is it more pronounced than in brickmaking. For instance, many imperfections are attributed to the burning which properly belong to other departments.

First, go with me to the kiln. Setters often make mistakes. See that they are careful to bind all the brick.; that each bench will hold its original position until you get through burning; avoid splits and openings in the kilns. If you do not, look for freaks when you open it. Set in blocks to allow for shrinkage, but tie your blocks. Then, to the dryer I will point out to you freaks, if you please, that you suppose are results of burning that properly belong to effects produced by the dryer, and yet not from lack of perfection of it. Then to the machine. Here again you make freaks which may be charged to your kiln work,

but is not. Still further, go on to your screens. Here freaks are made. Then to the dry pan. I can point out imperfections in your feeding that reflect results in your kiln. Now to the clay bank. Here oftentimes a great deal of your difficulty has originated which has its reflection in your kiln.

The kiln is often made the scapegoat of all the blunders made from bank, through each change, until it is burned. I have passed over the ilne of dry-pressed-brick making, and yet but a small portion of the difficulties you will encounter have been mentioned in this paper. If the causes and remedies apply to dry-press brick, they are equally applicable to other lines of brickmaking to a greater or less extent.

Let us take a little time and examine a few of the samples I have procured especially for this occasion. In No. 1 we have two brick, faced, burned in a test kiln. They were set on corner of a block. I first fired the kiln empty, until I supposed it was sufficiently dry to obtain fairly good results. I expected a clear brick like exhibit No. 2. On opening the kiln most of the brick ranged from exhibit No. 1 to exhibit No. 3. After giving this considerable study—and from what we find on exhibit No. 1 you notice the brick on the inside show fairly clear results—I concluded our clay was all right. But the result came from dampness. Near this test kiln is a ditch, often filled with running water. I attributed the difficulty to this. I at once refilled the kiln, it being still hot, and again burned it. On opening it I was fully satisfied; my diagnosis of the difficulty was correct. From that second test we prepared to ship this clay in quantities, and have made millions of brick from it, producing excellent results. Here dampness played its part.

In exhibit No. 4 we find these two-faced, one beautiful brick, the other all shivered. These were set on the corner of a block. Now, my theory of this is that the brick may have come from

L. G. KILBOURNE, Columbus, Ohio.

the bottom of a car not dry when set, or from clay where the dry pan was allowed to run nearly empty, thereby crushing pyrites and overcharging this particular brick, or both. Either case might produce similar results, but I lean, in this case, more to the latter. I believe if this same brick had been set in the center of the block, thereby receiving a dead heat instead of a blast, it would not have been affected.

Exhibit No. 5 was set four courses from the bottom, in the center of the kiln. On either side the brick were perfectly clear, as per exhibit No. 5X. You will wonder what caused this. Our burner had tested the kiln with the rod in the flues. He supposed the kiln dry, for it showed no dampness. Possibly the rod did not reach the center. Just here was where his error was made. He raised the fires just a little too fast. The sides were dry, but the center was not. Here he sealed the doom of the color of the brick; a so-called freak was the result. This kiln had just been cleaned out. Our habit is to watersmoke first up, then down, but, owing to the heavy rain, I concluded to watersmoke this kiln down-draft. Our burner, not being accustomed to this method, was deceived in his kiln.

Exhibit No. 6, you will notice, is an entirely different color from the others. This brick was carefully carried through watersmoking, raising the fires, and the kiln began settling when we had a heavy rain, almost a water spout, nearly flooding the kilns and the coal, and creeping, by steam, around some of the lower fire doors. The result is, as you see, a freak, entirely unavoidable under existing conditions. But had our kiln been protected as our machine or engine freaks in this case would be impossible. The time will come when our kilns will be properly housed and carefully drained.

In exhibit No. 7 we have another shade. Here I come to another phase of the situation. This was burned with a very poor quality of coal. To assist it we were compelled to use quantities of wood. Poor coal, combined with dampness in the flues, produced this result. I could follow this line through many so-called freaks, and what would we find? To obtain so-called freaks we simply violate some of the natural laws.

Exhibit No. 8 is the result obtained while passing through the dryer—not, as I have before stated, on account of imperfection in our dryer, but the result of combination in the clay. Here we have a sulphate of iron effect, pure and simple. To find it I had a few cars—five, I think—of each stratum of the clay made and passed through the dryer at the same time. The result was that the bottom stratum was the only one which showed very much of the stain; the next showed but little, and the others none at all. In this way I determined the difficulty and avoided it.

I had some photos taken of these cars as they came from the dryer, but with only partial success. It will convey an idea, however, of the difference. In some clays, should you allow your dryer to cool, raise the heat quickly; it would cause your brick to give out a dead ring after burning and cause stains, notwithstanding you set them the same, watersmoke the same and settle the same. But those dried in a regular heat will give out a clear metallic ring, while the others of the same clay will sound flat. This will show you the necessity of procuring good, reliable men, and seeing that each department is carefully handled, of course. I will admit that in the supposed best men we are sometimes mistaken, but you may readily see what it costs to make a mistake anywhere along the line of dry-press-brick making.

I have now taken up more of your time than I had intended, and I thank you for your attention. (Applause.)

—Kiln Experience—General Discussion.—

President Gates: I will call on Mr. Twells, of Wickliffe, O., to lead in the discussion of this paper.

Mr. Robert Twells: I have no criticism on the paper except to say that I think if the gentleman would take the money he spends in fixing up the electrical register and put it into his burner's salary the burner would think sufficient of his job to attend to it, and if he did not I would not want him to stay around me.

Mr. Lundy was then asked a number of questions by different members concerning the samples of brick with which he had illustrated his paper, all of which were answered satisfactorily. As they pertained to the brick, which were fine samples of the best buff and mottled brick, it is impractical to repeat all that was said.

President Gates: There being no further discussion, we will pass on to the next.

Secretary Randall: The next is a paper by L. C. Moore, of Memphis, Mo., entitled "Down-draft vs. Up-draft Systems of Burning." Mr. Moore is unable to be present, owing to the illness of his wife, as you will see by his letter, but he sends his paper, which I will read.

T. A. Randall, Secretary N. B. M. A.:

Dear Sir—Yours of the 27th inst. just received, and glad to hear from you. Inclosed you will find my paper prepared for the N. B. M. A. Convention. It is the greatest disappointment of my life that I cannot meet with you. Mrs. Moore is still very sick.

We are looking for a big trade this spring, but we have not enough brick on hand to supply any big rush. We will aim to get an early start. Yours truly, L. C. MOORE.

Memphis, Mo., Jan. 29, 1900.

DOWN-DRAFT VS. UP-DRAFT KILNS FOR BURNING COMMON BRICKS.

By L. C. Moore, Memphis, Mo.

Mr. President and Gentlemen of the Convention:

The two types of kilns here mentioned need no description. Most of the members of the N. B. M. A. commenced their first work at brickmaking with the old-fashioned up-draft kilns, and learned their A B C's around the glowing fires of their many arches. No doubt many who now hear this paper feel that they have advanced a few classes, and would think their time wasted to go back to the old methods. Still there are some who cling to the kilns of their grandfathers, believing honestly that few improvements in brickmaking are worth the cost of their installment. There is a class of brickmakers who occupy a middle ground between the old, as represented by the scove kiln, and the new, as represented by the down-draft. These are the men who have improved upon the up-draft ideas of their fathers by building good walls and furnaces and seeking to take advantage of all the advanced knowledge concerning heat production and

distribution. It is the improved up-draft kiln that I propose to compare with the down-draft, and aim to give as nearly as I can the data from which my conclusions are deducted, after a thorough trial of both systems upon the same yard and with the same clay and fuel.

My subject confines me to common bricks. By common bricks I suppose is meant those bricks that enter into the construction of comomon rough walls, wells, cisterns, cellars, foundations, sidewalks and the hundred and one uses an honest brick can be put to, as distinguished from pavers, front and ornamental bricks. There seemed to exist in the mind of our Secretary when he wrote me concerning this subject the idea that perhaps one might succeed with a certain kind of kiln in burning one class of brick and yet make a failure upon another class. And perhaps he is right.

I wish to state here that the term common bricks does not mean what it did when I commenced the brick business. The standard has gradually been raised, until our customers have become so exacting that we are forced to face a new issue in our business. The time was when, in our territory, an order for merchantable brick meant one-third red, one-third hard and one-third salmon. And on many contracts we cleaned up all of the pale bricks on our yards by making all of the inside work and cross walls of this material. We cannot say just where the responsibility lies for a change in sentiment on this question, but certain it is the change has come, and we suspect has come to stay, so that what is called a common brick now was a very uncommon brick in my boyhood times. Or, rather, the poorer bricks that were readily bought and used fifteen years ago cannot now be sold at any price. This demand for better bricks, or this wholesale rejection of inferior bricks, left such a great per cent. of culls upon the average brickyard using the old-fashioned kilns that the brickmaker was forced to make a move forward in the matter of kilns and methods of burning, in order that he should not suffer such great loss from the piles of stuff that gradually accumulated upon his yard in spite of his best efforts to dispose of them at reduced prices. The low prices on brick that have prevailed for so many years compelled every brickmaker to do his best to lessen the first cost of his product. And no branch of the industry afforded such a field for study as the question of kilns and methods of burning. To-day the greatest question in the minds of the members of our craft is, "What kiln shall I build?" Shall it be up-draft, down-draft or continuous? If one kind of kiln is better than another, what are the points of superiority? My personal experience for many years was confined solely to the up-draft, and we had made great efforts to perfect their construction by building good furnaces, walls and flues, that we might produce as much heat as possible from a given amount of fuel, exclude cold air from the burning ware, and evenly distribute the heat throughout the kiln. We flattered ourselves that we had accomplished a great deal in this line, and when we contrasted the burns made in our new up-draft kiln with those made in the old cased-up kilns, we had some reason to congratulate ourselves upon what we had accomplished.

But still there was considerable loss in cracked and broken arch brick and an occasional overburned arch, in spite of our most careful attention. Then there was a per cent. of pale bricks that had to be sold for $1 less per thousand than the first-class bricks. Even our best burns had a per cent. of disappointment that, though small, set us to thinking that perhaps there was something better than our way, and, if there was, it would pay us to search it out. So we set out upon a pilgrimage of investigation and visited factories near and far. We examined the work of the up-draft, down-draft and continuous kilns, patent furnaces, coking tables, rocking grates, and all of the many advertised methods and appliances one sees in the columns of our trade papers. We saw several kilns connected to one stack, and several stacks connected to one kiln. Each man had the best thing on the market, so that one might say the market was full of good things—more good things than we were able to buy or could use if they were given to us. But we had to make a choice or go home with our trip void of results. So we decided to try a well-known down-draft kiln with multiple stacks, each stack drawing from a given section of the kiln. We still used our up-draft kilns, burning in the down-draft as often as possible. We made a careful comparison of the two kinds of kilns in every phase we could devise:

First—Cost of construction.

Second—Time, labor and amount of fuel required per thousand of bricks.

Third—Quality of ware when burned.

In the item, "cost of construction," the up-draft has the advantage to a considerable amount.

We built just as good walls for our up-draft kilns as for the down-draft. We made as good furnaces outside the walls as we could devise, after several years' close study of heat production. We arched the kilns over with brick and built chimneys with dampers to distribute the heat. Of course, such an up-draft kiln approximated the cost of a down-draft, but did not require as many fire brick in its construction.

Second—Length of time, labor and amount of fuel required to burn.

If, after the heat is produced in the furnaces of an up-draft kiln, one could evenly distribute it throughout the kiln, so that the settle would be even from heads to center and from side to side, then a very few hours would be required to perfect a burn. But in spite of the burner's most careful attention he will find hot spots and cold spots in his up-draft kiln. Then begins the time-killing process to hold in check the hot places and distribute the heat to the cold spots. The delay begins even farther back than this, for he will find some places drying off faster than others, and he should begin the evening-up process during the watersmoking. Here the down-draft, with several stacks drawing from different parts of the kiln, has a great advantage over the up-draft, or even the down-draft with one stack. The heat collects in the vacant space within the crown, and forms a reservoir from which the various stacks may draw. Even during the watersmoking, if one part of the kiln is lagging, the temperature of the stack which draws from that part will show it. And by regulating the dampers one can even up the heat in a short time. After a red heat has been reached, the burner can watch the progress of the fires and regulate the distribution of the heat with unerring accuracy, so that when one part of the kiln has reached the required heat all parts on the same level will be equally hot, and when the required heat reaches the bottom the kiln is well and evenly burned. There is no waiting for one part to catch up with another, if the burner is careful in watching the progress of the heat. But the question may be asked, "Why cannot one distribute the heat so evenly in the up-draft as in the down-draft?" There is no doubt that the heat acts upon the same principles in the two kinds of kilns. It seeks the way out of the kiln that offers the least resistance. No setter can possibly set bricks so evenly but there will be more draft in some

L. C. Moore, Memphis, Mo.

places than in others. Besides, not all of the bricks contain the same amount of moisture. The parts that are damp and heavy offer the greatest resistance. If one should fire continuously, without attempting to regulate the draft, some parts would be well done, while others would still be damp. It is no easy matter in an up-draft kiln to force the heat to these backward places. In spite of one's efforts the heat runs to the hotter spots, and only by long and careful firing and dampering can one force the heat to the required places, so that much time and considerable fuel is consumed in evening up an up-draft kiln. We were pleased to find no such trouble in our down-draft.

An incident will illustrate this point. Our burner called upon us one evening to judge if the moisture was off sufficiently to allow hard firing. Upon examination, I found all the stacks hot and dry but one. It was cold. The burner had not noticed this, for down-draft kilns were not in his line. I closed the dampers in all of the chimneys but the cold one, and continued the slow fires. Within twenty minutes the steam was rolling from the cold flue, and in a short time it was as hot and dry as the others. We then increased the fires and completed the burn almost perfectly even from side to side. This gives the down-draft much the advantage over the up-draft in the three items of time, labor and fuel. Our most careful efforts to calculate this difference showed 25 per cent. each for time and labor and 15 per cent. for fuel more for the up-draft kiln.

Our last item of comparison is "Quality of ware when burned."

This is the most important of all the subjects connected with brickmaking and burning. Perfect quality of finished product is what we are all striving for. We aim to be economical in fuel and labor, and in former times I have ceased firing a kiln when

there were places not completely burned because I could use the soft brick in some work on hand, and it did not seem profitable, under the circumstances, to expend labor and fuel to perfect the burn when the kiln as it was would bring me just as many dollars as if burned to perfection. But this is poor economy, and, sooner or later, will lower the reputation of one's product. There are always enough failures made to keep the world supplied with poor materials, even when we are doing our best.

And now for a comparison of the qualities of the bricks burned in the two kinds of kilns:

First, Color—The bricks burned in the down-draft were of a more uniform color than those burned in the up-draft, although the matter of uniformity does not figure largely in our market. The red brick were of a deeper color and less marked by flashing.

Second, Shape—In the matter of shape the down-draft had much the advantage. The hottest bricks, being at the top, had very little weight to bear, and consequently were not warped or crushed as they reached near to the fusing point. For the same reason one could risk harder firing and raise the heat nearer the fusing point with less danger of melting the ware.

Third, Soundness—Here, again, the down-draft scored a victory. There were less checks and cracks, and, as for broken bricks, there were not twenty to the kiln. The reason for this hardly needs pointing out. The complete exclusion of cold air from the hot ware, and the fact that such a steady heat may be maintained, avoiding the alternate heating and cooling so common in the arches of the up-draft kiln, account for the superior structure of bricks burned in the down-draft.

We are free to state here to this assemblage of brickmakers that these results were obtained by an honest effort to do the best possible with both types of kilns. We were accustomed to

W. S. PURINGTON, Galesburg, Ill.

the up-draft, for we had spent years of labor and study upon it. The down-draft was new to us, but the results obtained were the first year's work with that style of kiln. We were slow to admit these facts, for the up-draft kilns, as we used them, were the product of our own ingenuity. But these conclusions were forced upon us by as thorough tests as we could make, and we give them to the brickmakers of America for what they are worth. (Applause.)

—Fuel Economy—General Discussion.—

President Gates: I will ask Mr. W. H. Rook, of Akron, O., to lead in the discussion of this paper:

Mr. Rook: I have been pleased to note the attention that has been given to burning, and while I am not supposed to be interested in it very much, yet I am. To my mind, economy in fuel is one of the things that is going to revolutionize the brick business. We have our machinery brought down to a fair state of perfection (you will pardon me for mentioning it), and in many places our ware is being dried by the waste heat from cooling kilns, and it seems to me that when it is once thoroughly understood it will be used by every one. The continuous system of burning will, I think, be brought down to a state of perfection, where it will effect a saving of nearly 50 per cent. Now, it has occurred to me, would it be a good idea in future conventions, in view of the importance of the one subject of fuel, for instance, to have this subject divided up into more topics and give more time to the details? Another thing, we have had several very important subjects in which the discussion was to be led by one man, and that man failed to appear. Now it occurs to me that it would be wise on important subjects if there could be two papers read on that same subject. It will bring out ideas that will not be affected by the man who is to lead the discussion. One man may think because the man who has read a paper has a reputation that is well known that, possibly, he may be wrong in his views and keeps still, when his ideas may be of vital importance to some man in the same locality and using the same kind of clay. I offer it as a suggestion that instead of one paper being read there be two, and that on the question of burning, drying and the saving of fuel that the topic be divided. In this connection we have overlooked the saving in our engines. By reason of the taking of air from cooling kilns we will save in our engine, because instead of putting in an ordinary engine we will put in a condensing engine, and this is important. The time will come when we will have condensing engines in all of our brickyards, and we will get the cost of fuel down to a minimum. Fuel is what we want to save. (Applause.)

Prof. Orton: I do not want to enter into the discussion of this paper specially, but I want to call attention to one fact. It seems to me that this is the most excellent paper I have ever heard brought before this Convention, and its excellence lies in the fact that this man has given a great deal of careful and calm investigation, covering at least one year, and when he tells of the comparative excellence of the two kilns, it is not his opinion, it is what he has been able to get out of his experience. Too often, I think, our papers here represent our opinions; they represent what we can hastily get together in response to the Secretary's demands for a paper, but Mr. Moore has come forward with something resembling a scientific investigation. He has not gone at it, perhaps, with all the refinement of modern science, but he has made a careful investigation, and I think the paper is entitled to unusual weight on that account.

President Gates: Unless there is further discussion the Secretary will announce the next.

Secretary Randall: The next is a paper entitled "The Continuous System of Burning," by Mr. F. S. Naugle, Warners, N. Y. I am very sorry that Mr. Naugle is not with us today. As you all know, he is a regular attendant at our yearly meetings, and is always in his seat when the sessions are called to order. I wish I could say that much for all of you. I am going to ask Mr. D. V. Purington to read this paper. He writes a letter explaining his absence.

T. A. Randall, Secretary N. B. M. A.:

Dear Sir—As circumstances which I very much regret will not permit me to be with you in Convention at Detroit, I herewith inclose the paper I have prepared; also my yearly dues. Kindly express my regrets to Convention friends at not being able to meet with them. Hope you will have a successful meeting. Very truly yours, FRED S. NAUGLE.

Warner, New York, Jan. 30, 1900.

THE CONTINUOUS SYSTEM OF BURNING.

By F. S. Naugle.

Mr. President and Gentlemen of the Convention:

There is possibly in the whole line of manufacturing no branch that has taken more rapid strides forward in the past few years than that of the clayworking industry, and the part which is represented in this Convention, that of brickmaking, is by no means a minor part.

Owing to the varied and continually increasing requirements the trade has been and is demanding a very much better article—harder burned, more dense, and, in fact, a very much different brick from those in general use a few years ago.

This has brought into the business much mechanical genius, thought and capital, and we have witnessed almost an entire revolution in our methods of manufacture, which is also true, or partially so at least, of our product.

This is, of course, proper, and no more than we should expect in such a progressive and wide-awake business country as ours; nor should we look for any other result from the body of men before us, representing business enterprises of varied proportions from all parts of our land, and also some from other lands, to whom we extend the hand of fellowship.

We would call your attention to-day, gentlemen, to the last, but by no means least, stage of manufacture, namely, that of burning our product. Not by down-draft or by the up-draft system, both of which are doing very effective work. And why should they not, backed by the brain and brawn that they are? Look, for instance, at Eudaly, Pike, Flood and others of down-draft fame; also the up-draft men, among whom was our lamented ex-President Morrison, all able exponents of their respective system.

This brings us to the subject assigned us, namely:

"The Continuous System of Burning Brick and Other Clay

Wares," which has in times past been one that for some reason has not received the careful attention it should have among the deliberations of our conventions.

Why should this be the case? From a theoretical standpoint it would seem to be the only practical, economical, as well as scientific, method.

Yet you may travel about a great deal, and be surprised if you happen across a plant equipped with a kiln of this type. Your curiosity is at once aroused. Can it be possible that this is a brick kiln in active operation—here a gang of men taking out burned brick—there another gang setting the unburned ones to go through the burning process in their turn.

Where are the firing places, coal piles, ash piles, clinker bar, scoop shovels and other familiar objects?

In answer to your inquiry you are directed to the top of the kiln. After reaching the top, if you are an old brick burner by the other systems, you do not feel like saying much.

You are more anxious to see. Here you find a man, one or two wheelbarrows, a coal box or two, containing an inferior grade of coal called slack or dust, and a small shovel, that makes the whole operation seem ridiculous. You are shown the different stages of the fire, beginning with the chambers being fired, some kilns having no chambers, simply sections of the kiln, with only a paper division, which burns away when the heat arrives at that point. There are generally about three of these compartments being fired at a time, dropping one about every twenty hours, and taking up a new one. The heat, passing ahead of the firing process by the draft from the stack, is drawn forward through the green brick, drying them out, and, finally loaded with moisture, passes off. In this way the brick are heated to a good red heat, sometimes thirty and forty feet ahead of the fires. In the other systems, after passing through the brick, the products of combustion are thrown from the kiln and wasted. Going back of the fire, we find the heat at about the same gradations, the cold air entering the kiln where it is open for emptying, passing through the cooling brick until it has reached a very high temperature, and it is in this condition that the fires receive the required amount of air.

The thought now strikes you that as far as the burning of brick is concerned the problem of perfect combustion is almost solved; also that vexatious question of firing a kiln without letting such large quantities of cold air rush into the kiln while cleaning fires, as in coal fired kilns, or while filling the arches in wood fired kilns.

It is not the object of this paper to take up the detail of manipulating the kiln, but to place before you for dissection, if you please. The system in general, with certain results that have been gathered, tend to show that no matter what its failures have been in the past its future is looking very bright, and its success would seem an assured fact.

Let us ask of ourselves this question: Why does not this system stand at the head of any yet put to practical use? Is it because the cost of construction is too great? Surely that cannot be, as we have before us actual figures from a number of reliable firms who are operating this system, some of them all three systems, and they report the first cost to be very little if any over that of well-constructed open top up-draft kilns, and about sixty per cent. that of equally well-constructed down-draft kilns, each system having a kiln capacity of the same producing power.

In making the comparison as to cost of construction, let us be fair and impartial. None other than kilns built in a good and substantial manner, of such workmanship as is necessary for all good A No. 1 kilns, has been considered. This, then, apparently leaves no argument as to the first cost. It may be that the cost of labor and fuel is excessive. We find that the cost of fuel from our tabulated reports is in favor of the continuous system by about fifty per cent. over either of the others; the cost of labor in burning also very much in its favor.

In figuring this cost we must base our figures on the amount of fuel handled or brought to the kiln ready for the burner. After the fires are once started at one portion of the kiln it is not necessary to use any more wood during the time the kiln is being continuously employed. This, we can see, is no small amount of labor during an entire season. This is in comparison with a coal burning kiln, and you have here saved practically all the labor required to prepare and put in position the kindling wood of an entire season, saying nothing of the purchase price. Also one-half the cost of labor in carting or wheeling coal from piles or cars to kilns, for if we save fifty per cent. of the fuel we have that amount less to handle.

After fuel is delivered at the kiln one man on each shift can readily take care of the kiln, and at no time during the burning are the duties of the burner very laborious. We do not want to go on record as saying that the same amount of care and attention given to any kiln is not required in this case, for without this attention we cannot get even fair results in any portion of our work, the most important of which is the burning.

Does it cost more to fill and empty this kiln than the others? This is found to vary with the condition and facilities at hand. If all brick are taken from the kiln and piled on the yard the price is about the same. If loaded on wagons direct from the kiln the cost remains about the same as the down-draft, but gives the up-draft the advantage of about fifteen per cent. where wagons can be backed directly into the kilns and loaded.

What about the waste of brick and the percentage of hard burned? The same authority says about equal to down-draft, and much less than the open-top kiln. One of the number written to says: "It just makes me sick to see broken hard brick and the good-for-nothing soft ones we have after each burning of our open-top kilns." How many of us have had the same experience but do not like to admit it?

Let us also take up the item of repairs. The repair bill of the up-draft or open-top kiln is not a very serious matter, except in the furnaces. A great many of this style of kiln do not have furnaces, simply doors and fixed grates, making the firing arch each time of green brick. This we do not consider a well-constructed kiln, and have taken into our calculation only those kilns of this type, having well-constructed furnaces to generate the heat.

The down-draft is a different article. Here we have fire boxes, a furnace, bag walls or fire bags (by the way, I wish some one would tell me where the term bag, as applied to a kiln, originated), perforated floors, setting crowns, grate bars, breaking bands, etc., and in this case makes you feel like the fellow with his waste in the open-top kiln.

With the continuous kiln we have no firing place to repair, neither have we bag walls, perforated floor or breaking bands. True, we have a crown, but being of a very much smaller radius does not settle as readily as the flat crown. Taken as a whole,

F. S. NAUGLE, Warners, N. Y.

the repair bill is very much against the down-draft and about equal with the up.

Now, gentlemen, since you have nearly all been convinced that the continuous is the only system in the list mentioned, some one laughs and says: "Yes that is all right and good, but how about the color?" That is what knocks it out. You cannot get uniform red brick. They are nearly all fire stained. This is a point, however, that all are not agreed upon.

Several good firms say "color good," others say "not so good as the open-top but as good as the down-draft." One firm says, "They get their most uniform brick from the continuous kiln."

It is a well-known fact that the kiln is not always at fault in regard to color, although it sometimes is, yet if this be the one great fault of the system (which is not admitted), can it not be overcome? Cannot some one give us some information during the discussion of this subject? One of our correspondents in answering the question asked by us, "Color of burned ware as compared with other kilns," says: "Color good, equal to others," and makes this footnote, "No top firing." This may be a solution to some of our trouble.

And now, gentlemen, assuming that economy is the great feature in all lines of business, and the maximum results are desired with the minimum of expense, does it not behoove us to look well into the merits of this system? It may be true that for some reason it has not been as successful in this country as desired until recent years. We are informed that in Europe it is in almost universal use. One German brickmaker of no little repute, while making a tour of this continent and visiting the works with which we are connected, expressed great surprise at our "expensive and wasteful method of burning," saying: "He could see no reason whatever why he could not burn our ma-

terial in his continuous kiln as well as he could his own," and that he "would not accept our wasteful kiln as a gift."

Right here it may be proper to say that the writer is not a kiln man, nor have we a kiln of this description on our plant.

We have spent no little time and money investigating the different systems, and from personal observations can say that there are, even in this country, some very satisfactory results being attained, having seen building brick and front brick of a very fine color, and a metallic ring, such as has not been our privilege to have seen any better from any other kiln, nor has this been in isolated cases.

There are also some very fine results being obtained in vitrified paving brick, hollow ware, etc. Nor has this paper been based on our own observations alone. Some two or three years ago that man Randall got on our track, and no amount of dodging, back tracking, side stepping or anything else could shake him off, and he finally treed us with this result. In order to more fully cover the ground we wrote to a number of reliable firms, whom we knew were using this system, or had been, in connection with the others, regardless of what special designs it might be, asking them in behalf of the Convention to answer the questions embodied in this paper, stating the object was to get at the general results, otherwise these answers were to be treated as confidential, and I take this opportunity of personally thanking them for their very kind and courteous replies. The figures thus obtained have been carefully tabulated, and are placed before you to the best of our ability.

We are sorry this subject has not been given to one more able

R. G. Eisenhart, Horseheads, N. Y.

to handle it in the way that it deserves to be, as we feel that it is a very important one.

And if it may result in bringing out a discussion that will thoroughly ventilate both the merits and demerits, we will feel that the honor of reading a paper before this intelligent body of men will not have been an empty one.

I thank you gentlemen for your kind attention. (Applause.)

—The Continuous System of Burning—General Discussion.—

President Gates: I am going to ask Mr. Eisenhart to lead in the discussion of this paper.

R. G. Eisenhart, Horseheads, N. Y.: Mr. President and Gentlemen—I am not much of a brickmaker, and very much less of a speechmaker, and I know but very little on this subject. All I do know about it is what I have learned by actual experience during the past four years, and I am afraid what little I do know I will not be able to tell you. There is such a thing as a man knowing something and not being able to tell it, and about the best way is to give you in brief my experience in my brickmaking career. It is only in that way that I can tell you of this continuous system of burning. In the start I want to say I am not in the kiln-building business, nor did I come here to talk in the interest of any particular kiln, nor have I come here prepared to talk on this subject. In fact, I did not want to talk to you at all, but I have enjoyed the privileges of coming here for a number of years, and if there is anything I can say of my brickmaking career that will be helpful to you, you are welcome to it. I left the mercantile business to engage in this business ten years ago. Two were engaged in it, and one man went out, and I was obliged to sink or swim, and that got me into the brickmaking business. In the start I must tell you what he left me. He left me a clay bank chockfull of limestone from one end to the other; he left me six old tempering wheels and an old worn-out machine; he left me kiln sheds containing no kilns; he left me a splendid open yard, I should judge about five acres, with lots of room to put the brick for the purpose of drying them and often for the purpose of spoiling them. Now, under these conditions, after leaving the dry goods business, I entered into the brick business. When I started out I want to say to you that I had never seen a brick made in my life, and you can imagine the subject got very interesting for me. (Laughter.) The facts were, it did not seem to be so interesting at the start as it got a little later on, as I began to draw on my bank account. The fact of the business was that I soon realized that something had to be done. To make myself more plainly understood, so you will grasp the situation, I had no home market whatever, and my brick had to be shipped out. There were four trunk lines over which to do the shipping, and they were all a mile or more away from my brickyard. I was in a bad shape to begin with. I was out of my regular business, so I had to go slow. It did not make any difference in which direction I shipped my brick. I either had to run on to Syracuse over there or Corning over here, or some other fellow, and they had quite a little fun with me because I had limestone and all of those different things to contend with. I soon found out that that thing would not do, and I summed the whole matter up and figured it out like this: "Here I am, and there is only one of two things to do, and that is get through or get out." My friends wanted me to get out, and I said, "I won't do it; I am going to make it a go." And I concluded the only thing to do was to make the brick clean and strong and bring the cost down to a minimum. About one of the first moves I made was to strike out for a place called Indianapolis, around somewhere in Indiana. I attended my first convention in Indianapolis, and I have never missed but one since, and that was down in Georgia, and I have looked into this matter as I went along. I came to the conventions and listened, and you all know that I have never had anything to say—I think this is about the first time I have every had anything to say. I came to the conclusion from what I had seen and learned that the proper thing for me to have was a continuous kiln. After I had decided upon that point I went to investigating these continuous kilns. Of course, if I struck Mr. Haigh, he had the best kiln in the world, and the next fellow had still a better kiln, and so I gave the kiln men the "go by," and I went to see the kilns in operation. It made no difference how far it was, or what it cost, I went just the same. I did not always get to look into the kiln, and I stayed there, no matter how long it took, until I was satisfied with the operations of that particular kiln. I went along until four years ago, when I decided what I wanted, and started out to build my kiln. I bought the plans and paid for the yard rights, just like a little man, because he would not give it to me unless I did. (Laughter.) I started to build the kiln, and before it was finished I put fire into it. I built a kiln of twenty chambers, which was about all the wind I could raise at that time. These chambers that I built at that time had a capacity of from twenty to thirty thousand brick. I soon found that twenty chambers was too small, but I went on making brick just the same, and after I got a good breath I built four more chambers, and continued making brick right along, and during the past season I put on nine additional chambers. This will give me thirty-five chambers. I am still in the brick business. My friends said, "It will down you, old man," but I said, "I am going to go through with it," and my competitors at Syracuse and Corning (and they are my closest friends) can tell you whether or not I am in the brick business. (Laughter.) So much for the experience I have had.

Now, as regards the cost of fuel. I have already explained to you what sort of kiln I had to burn, or, rather, sheds containing no kilns. We built the walls and topped them over, and we burned with wood, which was cheap enough, but we burned brick in those days for about 60 cents a thousand for the actual cost of fuel. One of the papers that was read here represented what we did very plainly. If we got one-half the brick we burned that would stand for a first-class brick we thought we had done very well. I saw the handwriting on the wall that that kind of business was of short duration, and so we used more care and better judgment, and burned more carefully, and we began to burn with coal, and, of course, when we did that we increased the cost of fuel up to 80 cents a thousand, and that was as low as we could burn and get merchantable brick. To the best of my recollection, it would be safe for me to say that the waste in our kilns, after we did our very best, the waste in the shape of poor brick, what we called poor brick and broken

in the arch, would be in the neighborhood of 12½ per cent. of my production. The past season we have made nearly 8,000,000 brick, and we have sold 7,500,000 brick. The cost of my fuel for the burning of the brick, making steam for the operation of my plant and operating the dryer, was 73 cents a thousand. The year previous to this it was only 67 cents a thousand—that is, for the year's business right through. I would explain to you that the difference in the cost of these two years was this: The previous year we did not make any brick until May, and operated our plant only during the warm months. During the past season I operated from the 1st of March to the last of September, and, of course, that increased my fuel bill. If you will make a mathematical calculation you can soon tell what it cost me to burn my brick. All of you know what it will cost to operate an engine and run a steam dryer, and see what it cost me in the old way and what it cost me to-day. We are burning the run-of-mine coal. I want to say right here that I expected to reduce the cost of my fuel somewhat, and could have done so had I been in a position to keep my coal separate. I can use cheaper coal in my kiln, but I could not keep the two grades separate this year, so it added a little to the cost of my fuel—about $2 a gross ton. I have contracted for $1.90, but during the scarcity of cars the past year they could not supply it, and I had to buy it at a higher price.

In conclusion, I can say this: That there are a few things that saved me from going down. That is all there is to it. I might just as well make an honest confession, and I do not know of any other place where it is more suitable to say it than right here. If there is any success in my business it is due to the building of that kiln and to my coming out of the ten years to nine of the conventions of the National Brick Manufacturers' Association, to the reading of The Clay-Worker regularly, and to the vast amount of information I got from the members of the Association, and if there is anything you want to know I will be glad to tell you if I can. (Applause.)

Mr. D. V. Purington: I want to say I do not know how that man has hid his light under a bushel as long as he has. (Laughter.)

President Gates: I understand that Mr. H. C. Dunn, of Erie, Pa., has a successful continuous kiln, and we would like to hear from him.

Mr. Dunn: I am afraid you have called on the wrong man, Mr. President. I have got what is known as a continuous kiln, and Mr. Eisenhart has been at my yard. It was a case of experiment with me to build this kiln. I thought it was the only thing to save me, and, by the way, it has saved me. I built a fire in it eighteen months ago, and it has not been out until three weeks ago, when I had it taken out. It took me some ten days or two weeks to kindle the fire in it in the first place, and it would not pay me to let it go out. The fellow who helped me build the kiln said when I was ready to start it he would help me out, but when I was ready he was not in a position to do that, so I had to go at it myself, with the assistance of a German foreman, who had been familiar with similar kilns in the old country. When I first set fire to it I melted an arch down, and that made me feel pretty blue. But we kept at it, and I got the thing going, and since then I have had no trouble. I put the coal in from the top. We only have one trouble—our coal is too coarse. We get the finest slack we can get, and it is still too coarse. If my coal could be reduced to a powder, just as fine as flour, I could handle it a greater deal better. As it is, if we get it a carload of slack, and some cars of coal are coarser than others, my men will say, "Can't you put that load of slack around the edge of the house and get us something finer?" It ignites quicker when it strikes the red hot fire. If the slack is too coarse it falls to the bottom and makes it hotter there than it is at the top. My burners have been with me two or three years. I have burned this kiln for three years. I keep my burners as long as I can, because they understand their business. We fire with a small shovel made for firing kitchen stoves. These shovels will hold very nearly a quart, and it is very seldom that they put in more than a pint at a time. You cannot put your fist down the hole we put the coal in. These brick are pretty much all hard. We have no soft brick to speak of. Once in a while we have a customer who wants a couple of thousand soft brick, and I refer him to the man who has an up-draft kiln. (Laughter.) What few soft brick we do have is at the opening where we back into the kiln. We have about four chambers on fire at one time. Our burner will sit down and light his pipe, or often go about something else. The other day he was making a box trap for catching rabbits. These brick are hard. In one sense of the word they are annealed. I can send a man a carload of brick, holding 10,000, and he will send word back that he has not a broken brick after they are unloaded. No cold air strikes them, and they are annealed. We have no trouble with our kilns. Sometimes I do not look at them for a week, though I am on the yard every day. It costs me about 25 cents a thousand to burn. I pay $1.75 for coal, which is soft coal slack. We make common building brick. We have never tried to make paving brick. My material is of a soapstone nature, and would not answer for paving brick, and, when you come to heat it, it will melt and run down. It will not hold its shape. My kiln cost $7,000, including the stack. I have sixteen chambers. If I were to build again, I would put in twenty-two or twenty-four chambers, for the reason that I have got to take the brick out when it is too warm for my men. We back the wagon into the kiln when we deliver them in the city. When we send them out of town we load them direct on cars.

Mr. Pike: Is not your success in not having broken brick due to the men handling them lightly, because they are too hot? (Laughter.)

Mr. Eisenhart: I can beat that all to pieces. Some times my men will not load them at all. (Laughter.)

Mr. Dunn: We turn out 25,000 a day. My kiln burns a red brick. The kiln discolors the brick some. There is a yellowish cast on some of the brick on the end. I cannot account for it in any other way but that the coal falls there and the fire burns the carbon out of the coal on the brick, and that causes the color. I bought two shovels last spring, in April, and gave them to my foreman to give to the men. I paid 30 cents for the shovels, and the other day I saw one shovel in the office, and I asked what was the matter with it? He told me they had

E. M. Pike, Chenoa, Ill.

not needed it yet—the other was still good. We sell a great many of our brick for cellars and sidewalks.

Mr. Eudaly: Can't your trypewriter do the firing for you? (Laughter.)

Mr. Tiffany: Could you make a good building brick?

Mr. Dunn: I do not know. I am only telling what I know—not what I guess at.

Christopher Roeske, Michigan City, Ind.: I have a continuous kiln, which I have burned for the last six seasons. I am the only one using a continuous kiln in my locality. It is not a large kiln. We have to wheel our brick in and out. We burn 16,000 a day. Just as the gentleman says, we had lots of trouble the first year. I got an excellent burner (so he claimed), but when I set him to work I found he did not understand it at all. Some burners told me to burn one way and some another, and I got blue. I thought I was "gone up." I could not do that, so I discharged my "excellent" burner and went at it myself and with better results, and the longer I run my kiln the better I understand it. I have got it down to perfection. I burn all hard brick, and I have harder brick at the top than I do at the bottom. I burn soft coal—Ohio slack. Indiana slack will not do. It makes my brick what we call coal marked. We burn good building brick, and use them for outside work. We burn both red and white brick. There is not much difference in handling both kinds of brick. You have to be very careful in first starting a new man or he will have the brick melted or too soft. I find it best to make as few changes as possible. We build our flues on a slope. The gentleman who just spoke said the coal dropped to the bottom. Set your flue on a slope and it will not do that. We fire our kiln from the top. Our brick cost us this year a little less than

29 cents a thousand for fuel. Our coal cost us $1.15. The Indiana screenings has so much sulphur in it that it leaves white marks on the brick, but the Ohio slack does not. We are burning soft-mud brick. Some times the brick are whiter than at others. If the brick are very dark the sulphur marks do not show. We have no cracked brick at all. What few soft brick we have are right close to the door. We have avoided that by casing up the door.

Mr. Eisenhart: I want to say a few things I forgot while speaking before, and that is to the people who have in mind the building of a continuous kiln. As a matter of caution, don't be too careless about investigating this matter. Don't jump to the conclusion quick. What I have done on my yard probably would not do for you at all. Another thing I do not remember having brought out before. There is such a thing as a continuous kiln and a semi-continuous kiln. I have a semi-continuous kiln. I am not afraid to predict that if those people who are going to build a continuous kiln—those who already have their brickyard located and their railroad facilities arranged—that out of ten nine will build a semi-continuous kiln, if they look into the matter thoroughly. The way my plant was located it was an utter impossibility for me to build a continuous kiln and use it practically. My brick have to be shipped out in cars, and, if I had a round kiln, more than one-half of my brick would have to be wheeled around to get them on board cars. I have made a pretty careful calculation, and I believe my fuel bill is about two cents a thousand more in the semi-continuous kiln than if I built it round. I think it would cost me ten cents a thousand more to unload a round

FRANK STILES, North Haven, Conn.

kiln in my yard. I think most other brickmakers would be in the same fix unless they built a new yard.

I have been asked time and again, "What does your kiln cost you?" Now, perhaps it does not cut any figure with you what my kiln cost me. You might start one and your money run out and again you might have so much that you would not know what to do with it. If you want to find out anything about it, call on me. Don't undertake to find it out by writing. I am too pushed to write many letters about continuous kilns, and I believe every other brickmaker is, and if you undertake to get information in that way you will get left, but if any of you are interested, don't hesitate to come to the brickyard, then you can see every detail and form your own conclusion.

Secretary Randall: Mr. Dunn said his kiln cost him $7,000, and a gentleman who is rather accurate in his figures has submitted the following question: "If a kiln for 25,000 brick per day cost $7,000, one for 750,000 per day would cost $210,000. If I had that much money, what would I want of a continuous kiln?" (Laughter.)

Mr. Roeske: He has made a great mistake in his figures. If he has one kiln, he has his stack built. That would answer for the larger kiln.

Mr. Dunn: I would not have shut down when my kiln had been running eighteen months had it not been for the way my stack was built. It was not built right. When the heat went into that stack it expanded on the inside and spoiled the stack. The heat in this stack is from 150 to 175 degrees. I have put in a pyrometer and tested it time and again.

President Gates: Mr. Haigh has had large experience in this line and I am going to call upon him.

Mr. Haigh: I was not expecting this, and I have not prepared anything to say on the continuous kiln, for the reason that my business is pretty well known to the Convention, and you might think I had a nut to crack. I will say, however, that you will please notice the difference between this Convention to-day and the one that was held in Washington in 1892. I don't know whether you gentlemen all remember or not, but I read a paper at that Convention, and I was raked over the coals, I tell you. Still, I have always had faith in the continuous kiln, for the reason I have been brought up with it from the time I was quite a boy. Why should it not be satisfactory in this country is something it would take one a good while to answer and explain. I have seen a good many that were not satisfactory, and the cause of it is that people are not educated up to it, and are not on to "the hang" of it. Very few burners not accustomed to a continuous kiln realize the small amount of fuel it will take. A question was asked about burning paving brick. In Catskill we have a very large continuous kiln. Some have said it is the largest in the world, and we are burning paving brick, and have burned nothing else since it was put up four years ago, and I will say to you it is very satisfactory.

Mr. Purington: The kiln I had reference to was operated by Mr. Haigh and burned by him. The kiln has been torn down and carted away and the company ruined. Don't be led away, as Mr. Eisenhart has said, until you have investigated the continuous kiln carefully.

Mr. Haigh: I did not build the kiln that was erected at Galesburg, and I think Mr. Purington will say that when I left Galesburg that kiln was in fairly good order. When I went there they could not use the kiln. They were in debt, and could not even raise money on bonds. Before I left them they had manufactured in two years nearly 10,000,000 pavers, and they were all burned in the continuous kiln. That kiln was altogether too large, and was not built at all for the burning of paving brick. I do not claim that continuous kilns will burn all kinds of brick or all kinds of ware.

Mr. Yates: I would be placed on record as a friend of the continuous kiln, having had some years of experience in burning a continuous kiln in England, and having burned the latest improved kiln there for some three years and eight months with decided success. Now, this is a matter of local consideration. You have heard the different gentlemen speak. One man says he can burn for 73 cents a thousand, another for 25 cents a thousand, and another gentleman says for 29 cents a thousand.

Mr. Eisenhart: My statement of 73 cents includes fuel for the boiler and dryer, while the other prices given were just for the burning of the brick.

Mr. Yates: There is no doubt but that he has a clay that is very easily burned. The other man says his brick will melt and run down, so this man has easy clay to burn. One gentleman has open fires, the other has closed fires. If you take the self-same kiln and erect it in another location, where you do not have the same conditions, it will be a failure. I am warning the brethren to beware of the danger line. I have made lots of mistakes in thirty years of experience, and if some friend had stepped up and said, "Yates, be careful; look out for the danger line," he would have been a very dear friend and saved me lots of anxiety and lots of money. I am afraid this thing will be worked up until the members will become imbued with the idea that they will have to have a continuous kiln to become rich. A man must be acquainted with his clay and ascertain what kind of coal it will take to burn the clay, for what succeeds in one will fail in another. I think in the near future, some kiln will be invented that will overcome these difficulties. I do not know of any continuous kiln that will successfully burn a front brick. The secret of success in a continuous kiln is to burn the top brick with close fire, but the time is coming when there will be a kiln on the market that will produce any kind of ware. As you are aware heat will rise. You cannot keep it down. It will go over out of one chamber into another, and your top will be burned up, and then it will go over to another chamber. The continuous kiln of the future is going to be a square down-draft kiln. When you have a clay that is easily burned, build one, but, when you have a clay that is hard to burn, you do not want a continuous kiln with a horizontal draft. I hope all you gentlemen will be very careful in going into the continuous kiln business. I can refer you to some sad experiences with continuous kilns.

Mr. Eisenhart: I am not here to defend any continuous kiln man, nor to say anything against any other kiln man, but I rise to defend what I have said. Mr. Yates would convey the idea that my material is exceedingly easy to burn, and because of that it requires but little fuel. I defy any man to burn my material in from eight to ten days in a common up-draft kiln. You men who see the necessity of a continuous kiln, should not

be scared away by the cries of one man to beware of the danger line. If I waited until some of my friends said, "Go ahead," I would have been bankrupt years ago. I took the bull by the horns. I saw what I needed and I went ahead and built my kiln. I could not wait until some fellow would invent something better. Don't be scared by any such argument. Look for yourselves like I did. Be careful you know what heat your material will require, and then, when you are ready, don't pay any attention to any body else. Just make your own calculations. (Applause.)

Mr. Miller: I want to say I have a continuous kiln, and it burns as good and as hard brick as anybody makes, except that I cannot get a good color. The watersmoking seems to burn on the brick. I have worked it for six or seven years. I have six chambers, burning 480,000.

Prof. Orton: It seems to me there has been interjected into this discussion a little bit of misunderstanding which should be corrected. I think what these various gentlemen have been talking about should be named continuous burning, rather than the continuous kiln. There are a great many varieties of kilns which are continuous or semi-continuous in which the original principles laid down by Hoffman have been consistently followed. But it is possible to build kilns of a very wide range and of different construction, suited to other needs, and still incorporate into these kilns these first principles. I do not believe that any one at this time can afford to get up and say he does not believe in the efficiency of the continuous kiln. That matter is pretty nearly beyond dispute. In Germany, where the principle originated, nearly all of the clayware is burned in a continuous kiln. Not only brick, but fine porcelain dishes and stoneware. They do not confine themselves to material of this sort, but they burn lime in them. The continuous kiln, as stated by eminent engineers, has proven to be the most economical in the whole field of metallurgical construction. There is hardly a metallurgical device that is equal to it. The statements that have been made as to the advantages pro and con and the warnings that have been given, and the claims which have been made of great success are all of them true. It is simply a question as to whether you will adapt these continuous principles to your particular case, will fit it to the requirements of the case, as to the kind of fuel available and the market you expect to fill. A continuous kiln can be built which will meet any requirement. It has been done and is in operation now. You can make continuous kilns suit any purpose in clayworking. It is done in Germany. You can see it if you go there. Any kind of clay ware can be burned in continuous kilns. (Applause.)

Mr. Dunn: The man who has been my foreman for some time is from Germany, and he told me he thought it was in the way the continuous kiln is handled. The American people haven't the patience to handle and start it in the first place that they should have.

President Gates: The Secretary will read the first question for this afternoon.

Secretary Randall: The first is No. 32: "Why is the Continuous Kiln for Burning Common Brick Not in More General Use in This Country?" (Laughter.)

Mr. Eisenhart: Mr. Yates may have one more show. (Laughter.)

President Gates: The Secretary will read the next.

Mr. Eudaly: But I want to hear more about this.

Secretary Randall: Can you tell us why continuous kilns are not in more common use in this country?

Mr. Miller: Mr. Purington can tell you better than anybody, for he told me. He came down to look at my continuous kiln and he looked at the brick and said, "These are good brick, but what would I do burning a million brick a day with a kiln like this? I would have to have a million acre farm to put these brick on." (Laughter.)

Secretary Randall: Question 33 reads: "Are Brick Made of Shale Better for Sewer and Foundation Work Than Common Hard-Burned Brick?"

Mr. Purington: Yes.

Mr. Blair: That is owing to whether or not they are thoroughly vitrified. Shale brick that are not vitrified are not worth anything for any purpose. There is a wonderful revolution going on in this country in sewer work, and it is tending toward an absolutely nonporous sewer, an absolute requirement of the demands of sanitation. In European cities, especially in Frankfort, Berlin and Hamburg, they started a reformation in these lines, and they have kept statistics to correspond with the cities of Louisville, Cincinnati and Pittsburg. Ten years ago the per cent. per thousand of deaths that resulted from typhoid fever, and diphtheria in the European cities corresponding with the American cities, I think was about 67 per cent., running from 67 per cent. to 77 per cent. To-day in the European cities they are making nonporous sewers that are better than the sewers in some of the cities named in this country. They have about accomplished it—so much so that the deaths from typhoid fever and diphtheria, and those that are caused from bacteria or germs of disease or microbes, have reduced the death rate in these European cities, through the construction of nonporous sewers almost wholly, from 77 per cent. down to 6.7 per cent. and 8 per cent. per thousand. It has awakened the sanitary boards and engineers in this country, and in many places they have come to the conclusion that it is almost a crime to construct a sewer out of anything except nonporous material.

Mr. Purington: I have no exception to take to most of what Mr. Blair said, but I think he will thank me for making a correction of one of his statements, which the sharp pencil of the Assistant Secretary has doubtless recorded just as he said it—that shale brick not vitrified are not good for anything for any purpose. Now a shale brick burned equally hard as a clay brick is equally as good as a clay brick for any purpose. An equally hard shale brick will stand as much and be as good for the purpose as a clay brick.

Mr. Blair: It is just a question of vitrification, and, for your contradistinction, I will say partially vitrified.

Secretary Randall: This brings us to the last question, No. 34: "Why is There Such a Lack of Uniform System in the Construction of Brickyards?"

Mr. Eisenhart: "Many men of many minds."

Mr. Eudaly: A gentleman (Mr. Wagner) read a paper here yesterday that we all enjoyed very much. He took up the subject of brick from the beginning, and he said that none of us

David C. Meehan, Columbus, Ohio.

are exactly alike, and I think that answers this question.

Secretary Randall: I have here a few questions which I think can be answered. One comes from a gentleman who has been detained at home. He asks: "Will Clay Dried Artificially Produce as Fine Brick on a Dry Press Machine (I mean taken from the bank and worked the same day) as the Same Clay Plowed, Dried in the Field, and Sheltered Two Months Before Working?"

Mr. Miller: It will not work as well.

Secretary Randall: Another is: "Is It Possible to Secure Uniform Burns in a Down-Draft Kiln Without Excessive Waste of Time and Fuel?"

This question was answered by Mr. Moore's paper. The next is: "Are Not Kiln Walls Usually Built Too Thick to Wear Well?"

Mr. Pike: I say no.

Secretary Randall: The last question is a short one: "Is Slack an Economical Fuel?"

Mr. Adams: Yes.

Secretary Randall: The next is the report of the Committee on Resolutions:

REPORT OF COMMITTEE ON RESOLUTIONS.

The committee on resolutions desires to submit the following report:

During the past year two of our members have passed from their labors here to their rewards in the hereafter. These two were R. B. Morrison, of Rome, and William Broadbent, of Oakdale, Ga. Mr. Morrison was a charter member of this Association, has served one term as its President, and his wide personal acquaintance with its membership, which renders his loss an al-

most irreparable one. His contributions to the literature of our craft have given him a reputation that will outlast the lives of all the present membership of the Association. Mr. Morrison and Mr. Broadbent were neighbors and competitors in business, but were always close personal friends. They departed this life within a few weeks of each other, and this Association desires to place on its records this brief testimonial to their lives and services.

The leading characteristics of both these men were abilities of no mean order, a consecration to their families and friends, and a conscientious desire to be right and to do right. We tender to their surviving families our tenderest sympathy, and unite with them in mourning the loss of two such men as R. B. Morrison and William Broadbent.

The committee recommend the adoption of the following resolutions:

—Committee on Trade Relations.—

Resolved, That we believe in the importance of an organized effort to create an active interest in burned clay ware on the part of the public in general, of government officials, of architects and builders and to increase its use as a building material, and to that end a committee shall again be appointed by the President to continue the work as defined in the resolutions of last year and as already undertaken by the committee of that year; and that a vote of thanks be extended to the chairman of that committee for the work already done.

—National Brick Manufacturers' Association Scholarship.—

Resolved, That we hereby express our great satisfaction with

Wm. Conway, Philadelphia, Pa.

the results accomplished during the past year by the aid of this fund; that we once more record our deep debt of gratitude to Professor Orton for his devotion to the interests of this Association, his untiring energy and his skill in the direction of this work, and that we appropriate the usual sum of $250 for the maintenance of this scholarship during the ensuing year.

Resolved, That we extend to his Excellency, the Governor of Michigan, and his Honor, the Mayor of Detroit, our hearty appreciation and thanks for the honor conferred upon us by their presence and participation in the exercises of this Convention, to the local Association and their ladies for the unbounded hospitality they have shown to us and our ladies on every occasion and in every possible way, to the press for their generous interest in our proceedings, to the management of the Hotel Cadillac for their successful efforts for our accommodation and comfort, and to our untiring officers for their skillful management, which has resulted in one of the best Conventions ever held by this Association. Respectfully submitted.

J. PARKER FISKE, Chairman;
D. V. PURINGTON,
C. H. YOHE,
R. G. EISENHART,
F. SALMEN,
WM. H. HUNT,
Committee.

On motion of Mr. Adams, seconded by several of the members, the report was adopted as read.

Mr. Eudaly: I want the attention of the Convention for a minute. If there is anything in the make-up of a man that he enjoys more than another it is to be remembered. I speak with considerable feeling, because I do it specially in connection with Mr. Morrison, and I do so for this purpose. I wish somehow we could by common consent, arrange that at least the ex-Presidents of our Association could be carried along in some way so it will show we remember them. If there is anything in connection with you gentlemen that I desire, it is to be remembered when I am gone. Can't we hereafter continue Mr. Morrison's name among the list of ex-Presidents, with a star to indicate he is deceased? (Applause.) I will make that motion, if it be necessary, that we continue on the list of the Executive Committee the name of any of our ex-Presidents who may pass away, indicating the fact that he is deceased by a star. I do not want to intimate for a moment that the Presidents of this Association are any better than the lay members or are a privileged class, but you must remember from time to time as we gather together the members of this Association select some one man for President, and it is an honor and he is the man of all men in the eyes of the members of the Association, and to me this idea does not in any sense belittle the men who are not ex-Presidents.

Mr. Bloomfield: While we are on this subject, it seems to me it would be well to include another little matter, which would give us at all times an opportunity to refresh our memory with a view of those who are still with us and of those on the other side of the river. Now, I would suggest that we have an album which shall contain the photograph of every member —those who are living and those who have gone on before. In this way we could remember men like Mr. Morrison and Mr. Taylor, who have given their very best for their craft and for their industry, and it will be a help to the Association, an inspiration for better things. It is a matter of little or no expense, but I think a photograph album should be started, where the memory and faces of all could be preserved for those who come after and those who are still with us.

The motion of Mr. Eudaly was seconded by several and carried.

Mr. Purington: The Committee on Resolutions omitted one thing which I think proper. I, therefore, make a motion that a copy of the resolution referring to Mr. Morrison and Mr Broadbent be prepared by the Secretary and forwarded to the families of Mr. Morrison and Mr. Broadbent.

Motion seconded by Mr. Parker and carried.

Secretary Randall: There is a list of the executive officers in the back of the programme. We have sometimes been criticised by a certain few who have said there is a clique in the Association who run things to suit themselves, and that some members of the Executive Committee had been dropped from the list because the clique had not been well cared for in that particular city. Now this is absolutely wrong and unjust. One member of the Executive Committee failed to pay his membership fee and so ceased to be a member of this Association, and so, of course, his name was omitted from the list. This list that has been published every year, will be published as heretofore, and, according to Mr. Eudaly's motion, the names of deceased members will be starred. The Executive Committee of the Association has never been criticised for anything within my knowledge, where a rational explanation was not forthcoming if asked for.

Several Members: You are correct.

Secretary Randall: Taking up miscellaneous business, we have here, I am very glad to say, a number of invitations for our next Convention. We have never before received so many invitations for a place of meeting. We have invitations from half a dozen places. As you will remember we have a standing invitation from Philadelphia. I rather expect to see a delegation here to urge the claims of Philadelphia. I have here letters from several commercial organizations of Milwaukee, from the Mayor of Milwaukee and from the Brick Manufacturers, backed up by three telegrams. One will be sufficient for all.

Milwaukee, Wis., Feb. 5, 1900.

Headquarters National Brick Manufacturers' Association, in Convention, at Detroit, Mich.

T. A. Randall, Secretary:

The local brick manufacturers' association met to-day and passed a resolution inviting the National Brick Manufacturers' Association to select Milwaukee as its next place of meeting, and we herewith extend to you a hearty invitation. If you so honor Milwaukee we guarantee that the Convention will be made a grand success.

HENRY HERMANN,
JOHN F. BURNHAM,
FERDINAND VOGT.

We also have invitations from Kansas City, Mo. One was presented the first session from Cincinnati, and we also have invitations from Cleveland, accompanied by a mass of literature setting forth the advantages of that city, and another from Buffalo, and, I am also proud to say, one from the Hoosier Capital, Indianapolis.

Mr. D. V. Purington: Mr. President, Chicago desires to be placed on the waiting list with Philadelphia. You have been

there twice, but we are not very modest. We will be glad to have you come again.

Mr. Eudaly: If there is going to be any wrangling about this we will go to Cincinnati and settle the matter.

Secretary Randall: We have here some letters from absent members which I will read.

—Letters from Absent Members.—

3716 Wabash Ave., Chicago, Feb. 6, 1900.

Mr. T. A. Randall, Secretary N. B. M. A., Hotel Cadillac, Detroit:

Dear Sir—My absence in Europe last year prevented my attendance at the Columbus Convention, so that I was looking forward with great pleasure at meeting a large number of my friends at Detroit, but I regret to find that my interests require my presence here.

Please find inclosed $5, being my subscription of $3 to the N. B. M. A. and $2 for The Clay-Worker

Yours truly, GEO. J. M. ASHBY.

Madison, Wis., Feb. 5, 1900.

T. A. Randall, Secretary N. B. M. A., Detroit, Mich.:

Dear Sir—Inclosed please find $5 in payment of renewal membership fee to the N. B. M. A. and one year's subscription to The Clay-Worker. At present I hardly think I will be able to go to the Convention. I met with an unfortunate accident last November, by which I lost one of my eyes, and I have not been out much since. The accident was caused by a flying chip from the stone crusher in my quarry. I hope you will have a pleasant and profitable meeting and enjoy yourselves royally. Please send receipts and a Detroit badge. Very truly yours,

DAVID STEPHENS.

Darlington, Beaver County, Pa., Feb. 6, 1900.

T. A. Randall, Secretary N. B. M. A.:

Dear Sir—I regret my inability to be with you this year at the Convention. I was called home by the sad intelligence of the death of my sister, and, owing to the pressing necessity of pushing my work ahead, I must return to Meridian, Miss., this evening. Business is advancing rapidly in the South. Wishing you all a splendid time, I inclose my fees and hope to be with you the next meeting. Yours truly, S. A. WILLIAMS.

Providence, R. I., Feb. 5, 1900.

Friend Randall, Detroit, Mich.:

At the last minute I have to write that I will be unable to attend the Convention, but probably this will cause no one disappointment but myself. I have been having a series of boils, which have culminated in a carbunckle on the back of my neck, and, of course, I am in no condition to go anywhere. I was particularly anxious to attend the Convention this year, for the reason that I hoped I might make some future arrangements for returning to the business.

Not being in the business at present, makes me an inactive member, but I write you this in merely a friendly way, and if any one should happen to speak of or inquire for me you will know why I have not been one of you this year.

With kindest regards to your wife, I remain, yours truly,

J. A. SNELL.

Mr. D. V. Purington: I move we adjourn.

Motion seconded by Mr. Pike and others.

President Gates: Gentlemen, permit me a word before declaring this Convention adjourned. I feel that we may all congratulate ourselves upon the success of this our Fourteenth Annual Convention. In all the Conventions I have attended, and I believe I have missed but one, none have exceeded, if indeed any have equaled, this one for enthusiasm and good feeling. Certainly our Association is stronger to-day in every essential element than ever before. May we not hope that a year hence we may be able to show the same relative growth, and again meet with an increased membership and ever-growing interest and enthusiasm in the work of promoting and advancing all clayworking interests?

Now, just a word personally. I want to again express my sincere thanks to you, one and all, for the compliment paid me in electing me President, and the kindly forbearance with which you have submitted to my rulings. I appreciate the honor very much indeed, and still more do I value the warm personal friendship which you have manifested. Nothing was further from my thoughts when I came to Detroit than that I should be so honored, and I again assure you that it will be my ambition to meet every requirement of our organization. Wishing each of you a pleasant and safe return home and a prosperous year, and trusting that we may all meet again a year hence wherever the next Convention may be held. I declare this Convention

Adjourned sine die.

THE POWWOW.

A Happy Combination of Banquet, Smoker and Vaudeville. Governor Pingree the Conspicuous Figure in a Delightful Bohemian Entertainment.

THE DETROIT POWWOW was a very happy function, a mixture of feasting, music, oratory and social entertainment, a combination that proved highly enjoyable to all who participated. The local commitee who arranged the programme was congratulated on all sides, and their efforts to please the visitors were thoroughly appreciated by every one. The function was set for 9:30 p. m., and for two hours previous the hotel lobbies presented an unusually animated appearance. The first excitement of the evening occurred when the Ladies' Committee gathered at 7:30 and marshalled their forces in the parlors prior to de-

HON. HAZEN S. PINGREE, Governor of Michigan.

parture for the theater. When the fair ones were escorted to their carriages not a few of the "other fellows" evinced a disposition to go along, but this was vetoed, and "buttonholing" was resumed with more than ordinary vigor.

At 8:30 Governor Pingree appeared on the scene, and was at once the observed of all observers. After being allowed to enjoy a cigar in the lobby he was claimed by Colonel D. V. Purington and spirited away to that gentleman's apartments. Only for a few moments was he allowed such exclusive honors. The irrespressible prince of good fellows, W. Graves Titcomb, and his boon companions, Frank Stiles and Alexander Porter, jr., captured and marched his Honor to their headquarters, Parlors L and M, where an impromptu reception was at once inaugurated, and many of the members were introduced and shook the Governor by the hand, and a strong, glad hand it is, one that can hold firmly the rudder of the ship of state.

At the appointed hour, under the leadership of the master of ceremonies, F. B. Stevens, of Detroit, who proved a master

toastmaster, the Governor, arm in arm with President Gates, led the way to the banquet hall, the beautiful dining room of the Hotel Cadillac, where there was in waiting a most sumptuous spread. It was a conquering host that soon laid to waste the tempting display of eatables and drinkables which were arranged on tables extending through the center of the room. Marching past this appetizing vision, the Governor and the speakers of the evening occupied the head table near a carpeted platform, the real purpose of which was realized later in the evening.

Flanking the Governor's table on either side, and extending back toward the entrance, were an hundred small tables, about which the guests were seated in an informal manner. The sweet music of the orchestra, Detroit's best, was well nigh drowned by the "chin" music which flowed unrestrained for an hour. By that time the tables bearing the viands were no longer lovely, and a transformation scene was enacted. The same dusky hands which had served the guests with whatever they most desired quickly carried away what was left of the generous spread, tables and all. Chairs were shifted to the space made vacant by those who no longer cared to dally at the side tables, on each of which were placed a cob pipe and a box of tobacco for every guest.

Master of Ceremonies Stevens called for order, which was quickly granted, and in a brief but happy address bade those assembled welcome, and introduced as the speaker of the evening the Hon. Hazen S. Pingree, Governor of the State of Michigan, who was greeted with a storm of applause. The Governor is a very large man, and his massive figure towered above all near him, but he was compelled to take the platform, and then in a plain but forceful way told of the pleasure it afforded him to wlcome the brick manufacturers to Michigan's metropolis. He said he was a manufacturer himself, and appreciated the importance to the people of all industrial organizations, and especially one like that assembled, which had for its object the advancement of the building interests of the Nation. He said he was not a public speaker, but a "public kicker," an expression that caused no little merriment. He spoke particularly of the paving brick industry, and expressed the opinion that brick streets had come to stay, and would grow in popular favor, both because of their durability and sanitary excellence. In closing he said he hoped that the present era of prosperity would continue indefinitely, and that the brickmakers might get their full share of its benefits. His remarks elicited much applause.

President W. D. Gates responded to the Governor's address in his usually happy manner. He told a story of two brothers, on one of whom the watchful mother placed a mustard plaster. By the artful dodging of the one for whom it was intended the plaster was put on the wrong boy, who suffered, while the intended victim lay and chuckled over his brother's discomfiture. He said he was in the situation of the boy with the plaster, while George Clippert, who had declined the nomination for the presidency, was doing the chuckling. This is the incident to which several members referred in the Convention sessions afterwards. He thanked the Governor and local committee in fitting terms for the courtesies extended to the visitors.

Mr. D. V. Purington was called for and responded in a felicitous way. The burden of his address was an appeal for a higher standard in all departments of clayworking. He urged as a step in this direction the compiling of clayworking literature, properly classified and indexed, to enable those looking for information on any special feature of the business to obtain it without endless research, which he holds is necessary at the present time.

This closed the oratorical features of the entertainment, which were followed by some excellent vocal music by a mixed quartet, after which a number of vaudeville turns were introduced, each and all of which were thoroughly enjoyed by everyone. During this time the ubiquitous waiters continued to serve liquid refreshments and cigars to all who cared to partake thereof. It was after midnight before the closing features of the performance was ended, but even at that late hour the button-holing process was renewed, and not a few of the members repaired to the lobby to talk brick, frequently interlarding a complimentary remark for the local committee, who had made such a pronounced success of the fourteenth annual powwow.

LIST OF MEMBERS N. B. M. A., 1900.

W. D. Palmer .....Atlanta, Ga
Chattahoochee Brick Co.....Atlanta, Ga
The Atlanta Terra Cotta Co....Atlanta, Ga
W. E. McCoy.....Augusta, Ga
Alton Paving, Building and Fire Brick Co..... .....Alton, Ill
Anderson Foundry and Machine Works .....Anderson, Ind
Woolley Foundry and Machine Works .....Anderson, Ind
George M. Stedman.....Aurora, Ind
J. H. Barry.....Atchison, Kan
J. F. Lewis.....Addison, Mich
E. L. Luther.....Adrian, Mich
D. S. Hildebrand.....Asheville, N. C
McCausland Bros.....Akron, O
H. B. Manton.....Akron, O
W. H. Rook.....Akron, O
R. M. Imbody.....Agosta, O
R. A. Doan .....Athens, O
A. Hoover (Fultonham Brick Co.) ....Axline, O
D. C. Cawley.....Allegheny, Pa
J. B. DeHaven..... .....Altoona, Pa
C. H. Yohe.....Alexandria, Va
W. H. Carter.....Appleton, Wis
John W. Sibley.....Birmingham, Ala
J. R. Copeland.....Birmingham, Ala
S. Robertson .....Birmingham, Ala
W. F. Tallman....Beamsville, Ont., Canada
M. E. Jacobs.....Berlin, Conn
Donnelly Brick Co..... ..Berlin, Conn
George E. Green.....Berlin, Conn
S. H. Alsip.....Belleville, Ill
Warren Wayne Ittner.....Belleville, Ill
O. W. Dunlap.....Bloomington, Ill
J. M. Elder.....Bloomington, Ill
George H. Drew.....Blue Island, Ill
Granite Brick Co, The.....Burlington, Ia
William Garig.....Baton Rouge, La
Rogers & Manson.....Boston, Mass
Parry Bros. & Co.....Boston, Mass
M. J. Hynes.....Boston, Mass
Philadelphia and Boston Face Brick Co. .....Boston, Mass
J. Parker B. Fiske.....Boston, Mass
George M. Fiske.....Boston, Mass
Edward W. Emerson.....Boston, Mass
Frank G. Evatt.....Boston, Mass
Alexander L. Porter, Jr. (Union Brick Co.) .....Boston, Mass
George L. Twitchell.....Boston, Mass
Edward P. Diggs.....Baltimore, Md
F. & A. Wehr.....Baltimore, Md
Baltimore Brick Co.....Baltimore, Md
C. H. Cromwell.....Baltimore, Md
Baltimore High Grade Brick Co. ....Baltimore, Md
Seely & McCord.....Benton Harbor, Mich
Jasper Adams .....Battle Creek, Mich
Brian J. Dunn.....Bangor, Me
William H. Brush.....Buffalo, N. Y
George W. Schmidt.....Buffalo, N. Y
F. W. Haake.....Buffalo, N. Y
S. C. Brush.....Buffalo, N. Y
C. A. Bloomfield.....Brooklyn, N. Y
John V. Van Pelt.....Brooklyn, N. Y
W. A. Stephens.....Batavia, O
L. P. Battefeld.....Bueyrus, O
W. W. Rechl.....Bucyrus, O
A. R. Batley.....Bucyrus, O
George H. Bruns.....Brecon, O
R. R. Hice.....Beaver, Pa
Reese, Hammond & Co.....Bolivar, Pa
T. M. Berkey.....Bolivar, Pa
J. A. Snell.....Barrington, R. I
George O. Berry.....Columbus, Ga
Charles Weaver .....Casey, Ill
George J. Walters.....Chatsworth, Ill
E. M. Pike.....Chenoa, Ill
D. V. Purington.....Chicago, Ill
W. D. Gates.....Chicago, Ill
Charles Bonner.....Chicago, Ill
J. E. Eastes.....Chicago, Ill
Thomas Moulding Co.....Chicago, Ill
Alsip Brick Co.....Chicago, Ill
A. F. Barron.....Chicago, Ill
H. J. Flood.....Chicago, Ill
S. S. Chisholm.....Chicago, Ill
George H. Hartwell.....Chicago, Ill
W. L. Jacoby.....Chicago, Ill
Harrington & King Perforating Co. ....Chicago, Ill
F. Lehmann .....Chicago, Ill
S. S. Kimball.....Chicago, Ill
John J. Moroney.....Chicago, Ill
P. L. Simpson.....Chicago, Ill
Tiffany Enameled Brick Co.....Chicago, Ill
Herman Thurow .....Chicago, Ill
George J. M. Ashby.....Chicago, Ill
William Simpson .....Chicago. Ill
Melvin L. Emerich.....Chicago, Ill
J. J. Gledhill.....Chicago, Ill
Fritz Wagner .....Chicago, Ill
J. H. Gray.....Chicago, Ill
W. G. Beyerly .....Chicago, Ill
D. W. Cummins.....Chicago, Ill
B. E. LaDow.....Chicago, Ill
W. H. McCarthy & Co.....Chicago, Ill
E. H. Moore .....Chicago, Ill
Francis D. Shaw.....Chicago, Ill
Windsor & Kenfield Pub. Co....Chicago, Ill
H. B. Skeele.....Chicago Heights, Ill
Otto Hensel.....Chicago Heights, Ill
L. C. Besley.....Council Bluffs, Ia
I. C. Wheeler.....Carthage, Mo
Walter Clark.....Clarksdale, Miss
Thomas Oliff.....Clio, Mich
Hervey Haigh.....Catskill, N. Y
M. E. Gregory.....Corning, N. Y
The Bonnot Co.....Canton, O
The Canton-Sparta Brick Co.....Canton, O
Carl Geissen (Royal Brick Co.)...Canton, O
J. O. Ludlam .....Canton, O
The Cleveland Brick Co.....Canton, O
G. B. Willis.....Canton, O
J. W. Hornsey.....Cleveland, O
C. W. Vaughn.....Cuyahoga Falls, O
W. A. Eudaly.....Cincinnati, O
R. A. Stoehr (Building Material Supply Co.) .....Cincinnati, O
B. W. Blair.....Cincinnati, O
Walter H. Caskey.....Cleveland, O
Spencer M. Duty.....Cleveland, O
C. B. Stowe.....Cleveland, O
Ohio Ceramic Engineering Co.Cleveland, O
F. H. Eggers.....Cleveland, O
Daniel Duty.....Cleveland, O
J. E. Ervin (Ervin Special Machine and Tool Co.).....Cleveland, O
Atlas Bolt & Screw Co.....Cleveland, O
William H. Hunt (Cleveland Hy. Press Brick Co.) .....Cleveland, O
Prof. Edward Orton, Jr.....Columbus, O
Fish Pressed Brick Co.....Columbus, O
The Ironsides Compound Co...Columbus, O
The Jeffrey Manufacturing Co..... ....Columbus, O
William Cannon .....Columbus, O
L. G. Kilbourne .....Columbus, O
A. V. Bleininger.....Columbus, O
Adam Schneider .....Columbus, O
Philip Schmidt .....Columbus, O
D. C. Meehan.....Columbus, O
The Harper-Norton Shale Brick Co. ....Conneaut, O
Ed. B. Reed.....Clearfield, Pa
G. S. Ettla.....Clearfield, Pa
G. A. Guignard.....Columbia, S. C
S. Geysbeek .....Denver, Col
J. G. Shea.....Danville, Ill
Leader Manufacturing Co.....Decatur, Ill
D. H. Heager.....Dundee, Ill
E. D. Mattes.....Decatur, Ill
American Blower Co.....Detroit, Mich
George H. Clippert & Bro.....Detroit, Mich
Walter J. Hayes.....Detroit, Mich
The F. H. Wolf Brick Co.....Detroit, Mich

Jacob Klein .....Baltimore, Md
Charles H. Classen.....Baltimore, Md
H. C. Wedeman (The Huetteman & Cramer Co.).....Detroit, Mich
L. D. Haggerty.....Detroit, Mich
F. B. Stevens.....Detroit, Mich
Thomas Bros.' Co.....Detroit, Mich
A. Wagner & Son.....Dearborn, Mich
John Hilton .....Dunkirk, N. Y
W. H. Bushell.....David City, Neb
The C. W. Raymond Co.....Dayton, O
W. C. Dennison.....Delaware, O
S. A. Williams.....Darlington, Pa
W. S. Ravenscroft.....Daguscahonda, Pa
Howard L. Dix.....Earl Park, Ill
F. W. M. Hammerschmidt....Elmhurst, Ill
George Lill .....Evanston, Ill
H. C. Kleymeyer (First-ave Brick and Tile Co.).....Evansville, Ind
George S. Cox.....East Liverpool, O
Thomas B. Anderson.....East Liverpool, O
C. G. Reese.....Elizabethtown, Pa
I. M. Justice.....Erie, Pa
H. C. Dunn.....Erie, Pa
Wallace Manufacturing Co..Frankfort, Ind
C. W. Williams.....Ft. Smith, Ark
Ft. Dodge Clay Works.....Ft. Dodge, Ia
T. C. Lundy.....Farmingdale, L. I
E. A. Poe .....Fayetteville, N. C
Edwin Brockway.Fishkill-on-Hudson, N. Y
W. H. Hoagland.....Findlay, O
D. M. Potter.....Fremont, O
R. M. Matson, Sons & Co...Falls Creek, Pa
A. O. Jones.....Ft. Worth, Tex
Frost Manufacturing Co.....Galesburg, Ill
W. S. Purington.....Galesburg, Ill
G. N. Dyer.....Gardner, Mass
Will J. King.....Grand Blanc, Mich
Gomer Jones.....Geneva, N. Y
D. P. De Long.....Glens Falls, N. Y
E. M. Freese & Co.....Galion, O
B. T. Place .....Galion, O
Arch Z. DeLong.....Glens Falls, Pa
William Finnegan.....Green Bay, Wis
George N. Dickerson (Standard Brick Co.) .....Hartford, Conn
James F. Mock.....Hartford City, Ind
Kleymeyer & Klute.....Henderson, Ky
Charles H. Bray.....Helena, Mont
R. G. Eisenhart.....Horseheads, N. Y
Preston Brick Co.....Hornellsville, N. Y
A. H. Newton.....Haverstraw, N. Y
Philip Goldrick .....Haverstraw, N. Y
J. W. Jones.....Haydenville, O
J. P. Stillwaugh.....Hamilton, O
T. A. Randall & Co.....Indianapolis, Ind
C. & A. Potts & Co.....Indianapolis, Ind
John McKay (Standard Dry Kiln Co.) .....Indianapolis, Ind
F. W. Butterworth.....Indianapolis, Ind
Robert Elliott (Standard Dry Kiln Co.) .....Indianapolis, Ind
Chandler & Taylor Co....Indianapolis, Ind
Hardin & Gray.....Indianapolis, Ind
H. Wulsching (Standard Dry Kiln Co.) .....Indianapolis, Ind
Justus C. Adams.....Indianapolis, Ind
James W. Hensley.....Indianapolis, Ind
Eureka Potterie Co.....Indianapolis, Ind
Heinrich Ries .....Ithaca, N. Y
Fred G. Adler.....Jackson, Mich
George H. Morton.....Jewettville, N. Y
Ernest S. Yates.....Johnsonburg, Pa
Alfred Yates .....Johnsonburg, Pa
Jefferson Brick & Tile Co....Jefferson, Wis
John Connelly .....Kensington, Conn
W. L. Davis.....Kensington, Conn
Horace D. Payne.....Kensington, Conn
J. M. Leach .....Kokomo, Ind
F. E. Dickinson.....Kendallville, Ind
E. W. Thoburn.....Kingston, Jamaica
J. W. Barney.....Kansas City, Mo
Walter S. Dickey.....Kansas City, Mo
Shinnick & Massman.....Kansas City, Mo
The La Salle Pressed Brick Co.La Salle, Ill
William Hammerschmidt .....Lombard, Ill
George T. Howe.....Leeds Junction, Me
L. Warstler .....Louisville, O
A. Magoon .....Logan, O
Henry Martin Brick Machine Mfg Co. .....Lancaster, Pa
James Prangley.....Lancaster, Pa
James W. Tester .....Montreal, Can
J. S. McCannell.....Milton, West, Can
O. T. Dennison (Mason City Brick and Tile Co.) .....Mason City, Ia
F. L. Martin.....Mazon, Ill
Isaac Hardy .....Momence, Ill
Christopher Roeske.....Michigan City, Ind
J. W. Carson .....Montezuma, Ind
B. W. Bennett.....Muncie, Ind
John D. Mock.....Muncie, Ind
J. W. McMillan.....Milledgeville, Ga
A. Humphreys .....Minneapolis, Minn
A. L. Martin.....Minneapolis, Minn
L. C. Moore.....Memphis, Mo
J. J. Hoffman.....Milan, Mo
C. F. Kaul .....Madison, Neb
Marion Steam Shovel Co.....Marion, O
C. H. Carpenter.....Martin's Ferry, O
John T. McIntyre.....McKeesport, Pa

David Stephens .....Madison, Wis
John Hopwood .....Menomonie, Wis
L. H. Taylor .....Milwaukee, Wis
T. B. Williams.....Morgantown, W. Va
E. S. Morse.....New Britain, Conn
R. Clifford Merwin.....New Britain, Conn
William P. Felt.....New Britain, Conn
H. P. Shares .....New Haven, Conn
H. J. Wiley.....New Haven, Conn
J. Wheaton Stone.....New Haven, Conn
Ezra D. Fogg.....New Haven, Conn
S. P. Crafts.....New Haven, Conn
Frank L. Stiles.....North Haven, Conn
F. H. Brockett.....North Haven, Conn
J. A. Blaffer.....New Orleans, La
W. A. Bailey .....Northampton, Mass
R. C. Penfield.....New York City, N. Y
Orin E. Person.....New York City, N. Y
Pfotenhauer & Nesbit.New York City, N. Y
Meeker, Carter & Booream..... .....New York City, N. Y
Robin Main .....New York City, N. Y
John B. Rose.....New York City, N. Y
Ohio Mining and Mfg Co..... .....New York City, N. Y
Charles Hansel.....New York City, N. Y
George A. Ellis.....New York City, N. Y
Charles F. Harris.....New York city, N. Y
W. F. Fisher.....New Brunswick, N. J
C. H. Doan.....Nelsonville, O
J. C. Baird.....Nelsonville, O
C. J. Edwards.....Newberg, Ore
M. S. Marquis.....New Castle, Pa
T. L. Herbert.....Nashville, Tenn
A. W. E. Hellyer.....Ottawa, Can
J. Fred Smith.....Omaha, Neb
Cyrus Chambers, jr.....Overbrook, Pa
R. C. Brown.....Oshkosh, Wis
A. Brewster .....Pine Bluff, Ark
J. T. Ebert.....Palatka, Fla
F. H. Carter .....Peoria, Ill
A. W. Walton.....Princeton, Ill
Robert Nesch .....Pittsburg, Kan
F. H. Gwynn.....Pittsburg, Kan
The Horton Manufacturing Co..... .....Painesville, O
J. D. Fate .....Plymouth, O
A. C. Giveler.....Pine Grove Furnace, Pa
J. H. Chambers.....Philadelphia, Pa
William Conway .....Philadelphia, Pa
D. Charles Murtha.....Philadelphia, Pa
Thomas Flood.....Philadelphia, Pa
T. B. McAvoy .....Philadelphia, Pa
Frank B. McAvoy.....Philadelphia, Pa
George W. Sharer.....Philadelphia, Pa
E. Webster & Nephew.....Philadelphia, Pa
Sankey Bros. .....Pittsburg, Pa
Phillips & McLaren.....Pittsburg, Pa
Mack Manufacturing Co.....Pittsburg, Pa
W. D. Henry.....Pittsburg, Pa
A. A. Hersperger.....Pittsburg, Pa
William Flinn .....Pittsburg, Pa
W. R. Hersperger.....Pittsburg, Pa
W. R. Cuthbert.....Pittsburg, Pa
Grant Dibert .....Pittsburg, Pa
George H. Albertson.....Pittsburg, Pa
Xavier Wittmer.....Pittsburg, Pa
M. M. Bushong.....Phoenixville, Pa
W. G. Titcomb.....Providence, R. I
Samuel Gunther .....Port Washington, Wis
H. W. Gerke.....Quincy, Ill
H. H. McClure.....Rome, Ga
R. B. Morrison & Co.....Rome, Ga
Madden & Co.....Rushville, Ind
W. H. H. Rogers.....Rochester, N. Y
C. A. Shultz.....Rondout, N. Y
Jay Terry .....Rondout, N. Y
Albert Terry .....Rondout, N. Y
Montello Brick Co.....Reading, Pa
E. G. Durant.....Racine, Wis
Gladding, McBean & Co.San Francisco, Cal
W. C. Trotter.....St. Johns, P. Q., Can
J. T. Underwood.....Springfield, Ill
C. C. Barr.....Streator, Ill
Fawcett Plumb .....Streator, Ill
W. B. Lower.....Sioux City, Ia
C. J. Holman .....Sergeant Bluff, Ia
F. Salmen .....Slidell, La
J. S. Sanderson.....Springfield, Mass
T. D. Potter.....Springfield, Mass
E. L. Cook .....State Farm, Mass
A. C. Ochs.....Springfield, Minn
James A. Gray.....Saco, Me
R. L. Jones.....Saginaw, E. S., Mich
John H. Qualman.....Saginaw, Mich
M. C. Heinemann.....Saginaw, Mich
Charles H. Kepler.....Saginaw, Mich
D. M. Warner.....Sparta, Mich
Anthony Ittner.....St. Louis, Mo
L. J. Howard.....St. Louis, Mo
H. A. Wheeler.....St. Louis, Mo
M. F. Williams.....St. Louis, Mo
J. M. Williams.....St. Louis, Mo
Lemon Parker .....St. Louis, Mo
Otto C. Oehler.....St. Louis, Mo
T. P. Plumridge.....St. Louis, Mo
W. P. Grath.....St. Louis, Mo
Fernholtz Brick Machinery Co..... .....St. Louis, Mo
W. C. Mitchell.....St. Louis, Mo
J. C. Steele & Son.....Statesville, N. C

C. H. Merrick.....Syracuse, N. Y
J. Frank Plumb.....Syracuse, N. Y
James L. Breed.....Syracuse, N. Y
George E. Derry..... .....Sidney, C. B., Novia Scotia
D. E. Pidgeon.....Salem, O
A. J. Darbyshire.....Sabina, O
W. D. Richardson.....Shawnee, O
George J. Fickes.....Steubenville, O
Crescent Manufacturing Co..... .....Shousetown, Pa
J. A. Francis.....Shamokin, Pa
M. H. Dale.....Scranton, Pa
J. P. Cahoon.....Salt Lake City, Utah
H. L. Jacobs.....Suffolk, Va
J. D. Russell.....Toronto, Can
E. E. Gorton.....Terra Cotta, Ill
William Paul Gates.....Terra Cotta, Ill
A. E. Morrison.....Terre Haute, Ind
Will P. Blair .....Terre Haute, Ind
C. W. Hoff.....Terre Haute, Ind
George R. Grimes.....Terre Haute, Ind
B. C. Pierce.....Taunton, Mass
H. Brewer & Co.....Tecumseh, Mich
George F. Cotton.....Table Rock, Neb
Harvey S. McLeod.....Troy, N. Y
Trimble Brick Co.....Trimble, O
E. B. Hall.....Toledo, O
Peter McGough .....Toledo, O
James Fox .....Toledo, O
W. A. Howell.....Toledo, O
Ellis Lovejoy.....Union Furnace, O
R. D. Culver.....Veedersburg, Ind
I. G. Poston.....Veedersburg, Ind
J. E. Clapp.....Vicksburg, Mich
Kendall & Flick.....Washington, D. C
John Miller.....Washington, D. C
C. B. Pearson.....Washington, D. C
W. H. West & Bro.....Washington, D. C
Jefferson Middleton (U. S. Geol. Sur.) .....Washington, D. C
F. E. Swift.....Washington, Ia
James B. Crowell.....Wallkill, N. Y
F. S. Naugle.....Warners, N. Y
H. E. Stone.....Wickliffe, O
Robert Twells.....Wickliffe, O
Stevenson & Co.....Wellsville, O
C. McDermott.....Wellington, O
Andrew Branstetter.....Wooster, O
J. W. Everal.....Westerville, O
A. D. Sharples.....West Chester, Pa
George B. Waite.....Wilkesbarre, Pa
A. R. Root.....Wilkesbarre, Pa
George T. Dickover.....Wilkesbarre, Pa
Henry Hasbrouck.....Williamsport, Pa
D. P. Guise.....Williamsport, Pa
T. W. Carmichael.....Wellsburg, W. Va
J. P. Norton.....York Village, Me
Zeeland Brick Co.....Zeeland, Mich
O. N. Townsend.....Zanesville, O
Ross C. Purdy.....Zanesville, O

EXECUTIVE COMMITTEE.

1900-1901.

President—WM. D. GATES, Chicago, Ill.
First Vice President—GEORGE CLIPPERT, Detroit, Mich.
Second Vice President—C. A. SCHULTZ, Rondout, N. Y.
Third Vice President—XAVIER WITTMER, Pittsburg, Pa.
Secretary—T. A. RANDALL, Indianapolis, Ind.
Treasurer—J. W. SIBLEY, Birmingham, Ala.

EX-PRESIDENTS.

W. A. EUDALY (1886), Cincinnati, O.
D. V. PURINGTON (1887), Chicago, Ill.
T. B. McAVOY (1888-89), Philadelphia, Pa.
J. C. ADAMS (1890-91), Indianapolis, Ind.
C. B. PEARSON (1892), Washington, D. C.
ANTHONY ITTNER (1893), St. Louis, Mo.
W. H. ALSIP (1894), Chicago, Ill.
F. H. EGGERS (1895), Cleveland, O.
W. H. BRUSH (1897), Buffalo, N. Y.
WM. FLINN (1898), Pittsburg, Pa.
W. D. RICHARDSON (1899), Shawnee, O.
*R. B. MORRISON (1896), Rome, Ga.
*C. P. MERWIN (1888-95), Berlin, Conn.

COMMITTEE ON TECHNICAL INVESTIGATION.

Prof. Ed. Orton, Jr., Columbus, O., Secretary.
W. D. Richardson, Shawnee, O.
Anthony Ittner, St. Louis, Mo.
D. V. Purington, Chicago, Ill.
C. A. Bloomfield, Brooklyn, N. Y.

IN MEMORIAM.

James Taylor.....Port Monmouth, N. J
R. B. Morrison.....Rome, Ga
William Broadbent.....Oakdale, Ga

THE SATURDAY OUTING.

An Enjoyable Day with the Detroit Brtckmakers—A Trolley Ride to Mt. Clemens—Winter Sports on Lake St. Clair—A Big Dinner at McSweeney's.

Those who had to hurry home, and so could not remain in Detroit over Saturday and participate in the pleasure trip arranged for that day, missed a most enjoyable affair. At 9 o'clock Walter J. Hayes, Charles F. and George Clippert, the indefatigable members of the Entertainment Committee, came up smiling and announced that all was in readiness for the trolley ride to Mt. Clemens, a great health resort or water cure, some twenty miles from the city. A party of nearly one hundred, including some twenty ladies, made up the party, and a jolly crowd it was. The cars were large and comfortable, making the ride a pleasant one. The ride along the shore line presented many picturesque scenes. The local committee, ever mindful of the comfort of their guests, passed cigars to the gentlemen and candy to the ladies. The day was a delightful one. Even the weather man deserves credit for giving us the best that climate affords—a bracing, sunshiny, wintry day.

Arriving at McSweeney's, a famous resort, warm beverages

GEO. H. CLIPPERT, 1st Vice-President, Detroit, Mich.

were offered those who, coming from Southern climes, needed a little gentle stimulant to prevent catching cold. Wraps were readjusted, and, under the leadership of experienced yachtmen, the visitors were initiated in the sport of ice yachting, a most exhilarating pastime. Those who have never participated in such sport cannot appreciate the delight of skimming over the ice at the rate of a mile a minute. While it seemed a little "skeery" at first, and for that reason some of the ladies were disinclined to take an active part, they finally overcame their timidity and joined in the sport with a zest. Our one regret is that we did not have our camera that we might have photographed Jesse Adams, Chris. McDermott and "Father" Pike as they appeared in the semi-recumbent positions necessary for this sort of navigation. The former proved too "wide out" for comfort, the steersman of the yacht declaring that he interfered with the boom, because he was as tall lying down as he was sitting up. After an hour of such sport the party returned to the hotel, with the color of youth in their cheeks and with appetites that enabled them to do full justice to a splendid fish and game dinner most generously served.

After such a feast all were really "too full for utterance,' but, repairing to the parlors, speeches were called for. Our "Brickmaker-to-the-President" Adams was the first to respond, and, notwithstanding his plethoric condition, did himself proud, as he always does on such occasions. He was followed by Mr. Plumridge, Mr. Brush, Mr. McDermott, Mr. Tiffany, Mrs. Shaw and Mr. Ittner, each and all of whom sung the praises of the Entertainment Committee, and a vote of thanks was tendered the local people for the splendid entertainment afforded the visitors. Again wraps were donned, and another hour was spent on the ice. Then "all aboard" was sounded, and the party made the trip to Mt. Clemens, where a few tarried to sample the water, and the balance were trollied back to the Cadillac, more than pleased with the day's sport, declaring that they would not have missed it for anything.

CONVENTION ECHOES.

The Last the Best.

My Dear Randall:

I am home again in working harness, after a week spent profitably and pleasantly attending the sessions of the Ceramic and N. M. B. A., and the latter reminds me very much of an old friend of mine, somewhat my senior, who is in the habit of coming to New York to see me, and we invariably adjourn to a hostelry, noted for its fine wines and cooking, to enjoy its hospitality. We generally imbibe some of their white burgundy, and my old friend, after the first glass, puts it down with these words: "This is a little bit better than any we have had before," and so I think of our last Convention was. In point of interest and average attendance I think it excelled all others.

Wishing you all success and trusting you and yours arrived home safe and sound, I remain, yours truly,

Brooklyn, Feb. 14. C. A. BLOOMFIELD.

A Five-Year-Old's Impressions.

Dear Editor:

In former Convention numbers of The Clay-Worker I have read with interest letters from members of the Association giving their opinions of the Convention. Now, if it is allowable for a "five-year-old," who has attended every Convention since it was his privilege to become a member five years ago, to express his opinion, here's mine:

The Conventions have all been good, but I think the one just closed at Detroit is entitled to the banner. And now to our brother brickmakers of the Convention City, for all their hospitality, and particularly for the opportunity of a ride on what Brother Adams calls a three-legged stool, do I wish to extend my most grateful thanks. Sincerely yours,

ELLIOTT S. MORSE.

New Britain, Conn., Feb. 20.

The N. B. M. A. a Great Educator.

Editor CLAY-WORKER:

We returned from the meeting of the N. B. M. A. at Detroit very much pleased with the success of the Convention and instructed by the exchange of experiences with the members. We were struck with the rapid advancement made by the Association in technical knowledge, as well as the tout ensemble of the body. This was made more manifest after an absence from the meetings for several years. The new members who have come to the front and entered into the discussions before the body maintain the high reputation of the craft and contribute to our education in clayworking.

Mr. Blair, of Terre Haute, was particularly interesting in his remarks, and much information was gained from his able presentation of the paving brick interests. We were proud of the name, but could not trace a relationship.

The old members—Adams, Ittner, Eudaly, Purington and others—maintained their leadership in debate. D. V. Purington, whom we style the king of the brick men, for we believe he is the largest in the world, in his desire for knowledge and to further the interests of the Association exhibited all the enthusiasm of a beginner. His motto must be, "Sincerity is the genius of enthusiasm, and truth accomplishes no victories without it."

W. D. Richardson, W. D. Gates, Ellis Lovejoy and Prof. Edward Orton furnish us the scientific properties of clay and add much to our technical knowledge. The three former have

done much for ornamental brick in this country and artistic beauty in brick, for where their brick are used "the houses are formed of oak and kneaded clay, such as artists fashion." The report of the Committee on Technical Information was very valuable, and no doubt the committee will continue its great work. The suggestion of D. V. Purington that the literature of the craft and technical information in its journals be collected and indexed for ready reference is a good suggestion, and should be acted upon at once. The Clay-Worker has added much to this mass of information, and its able editor, T. A. Randall, and our worthy secretary of the N. B. M. A., should have charge of this work. As the laws of the country are from time to time codified and arranged in convenient form, so should the laws of the science of clayworking be so arranged.

The selection of W. D. Gates as President gave universal and unanimous satisfaction. Genial, witty and practical, he is the right man in the right place. The Convention was a great success, from the annual address, a statesman-like document, to the close.

The entertainment by Detroit was refined and hospitable; full of eloquence and clean fun was the powwow. There were many missed who were with us in former years, some of whom have joined the silent majority, and occupy mansions not built with human hands, eternal in the heavens. To my mind the greatest benefit of the Association is the interchange of ideas with the many practical men you meet in attendance, and the object lessons afforded by machinery on exhibition, and illustrations afforded by the machine men and the kiln men present. Truly the N. B. M. A. is a great educator, and long may school keep. Very respectfully,

B. W. BLAIR, a Charter Member.

Cincinnati, Feb. 14, 1900.

The Convention an Agreeable Surprise.

Dear Mr. Secretary:

You will remember asking me what I thought of the Detroit Convention. I must tell you that I am not capable of describing to you my impressions of that gathering. This was my first year at the Brick Manufacturers' Convention, and I must candidly tell you that I had no idea of meeting such a large and unusually intelligent body of men. One thing that struck me most pleasantly was the fact that competitors met each other there and mingled most congenially, as much so as if they were brothers, and that feeling of brotherhood seemed to pervade the whole Convention atmosphere. I am persuaded that a man cannot go to that gathering without receiving many benefits, to say nothing of the pleasure that he derives. Personally, I enjoyed every minute of my stay, and I hope that it will be my good fortune to meet with the Association next year and for many years to come, and, as Rip Van Winkle says, "May she live long and prosper." Yours very truly,

WM. F. SCOTT,

Secretary and Treasurer Fernholtz Brick Machinery Co.

St. Louis, Mo., Feb. 17, 1900.

"Excelsior" Says One Who Has Attended Every National Convention.

My Dear Randall:

I presume that your February number has been published before this, and that the letter of review of the Fourteen Annual Convention that I promised to send will never be written. If I had written it, all could have been condensed into a few words to the effect that at Detroit, as in every other place but Cincinnati, in which the conventions of the N. B. M. A. have been held, "Excelsior" had been the motto. I have no desire to reflect upon the misfortunes of at least one of our ex-Presidents (who, by the way, happens to be sitting in my chair at this present moment), but I can not but think it to the credit of the Association that it has for two successive years elected a college graduate as its presiding officer. It is also to the credit of the N. B. M. A. that there is such a goodly sprinkling of young men of education in attendance. A little or a good deal of practical experience will make better leaders of these young men than their elders ever dreamed of.

It certainly was good to have been there, and I do not need to tell you or any one else who saw me there that I thoroughly enjoyed every moment of it. My better half and I have spent the time since the Convention in New York and here, have our trunks here, and I am not forgetting more than one-half of what I should remember. Mr. and Mrs. Barr journeyed as far as New York with us, and Brother Bloomfield joined us at Buffalo. I am sorry I could not find time earlier to tell you that the Fourteenth Annual Convention, in my judgment, "takes the cake." Always yours,

D. V. PURINGTON.

Hotel Raleigh, Washington, D. C., Feb. 24.

The Enthusiasm of a New Convert.

Friend Randall:

In reply to your favor of the 14th, I wish to thank you for the trouble you have taken in getting the rebate for me for excess charges for the railroad tickets.

We most thoroughly enjoyed our trip to Detroit, and deem it the most enjoyable business gathering we have ever attended. I certainly feel repaid for the trouble and expense I had, and deem it a good investment. If possible I will attend every Convention to come, whether it be held on the shores of the Atlantic, Pacific or the Gulf of Mexico.

My preference, however, would be South or West. Why can we not gather in California or Florida? Yours very truly,

Springfield, Minn., Feb. 17, 1900. A. C. OCHS.

A Delegate Who Was "Put off at Buffalo."

My Dear Randall:

Father has forwarded your letter, and I am reminded thereby that I agreed to give you my impressions of the Convention. I hope I am not too late.

The Detroit Convention was full of interesting incidents. The programme, I think, was the best of any of the conventions I have attended. The subjects were more practical and the discussions had less irrelevant talk than heretofore. The thing that impressed me most was that the speakers all seemed to have a personal experience in the subject they discussed, and they stuck to the subject.

Our Detroit friends gave us royal treatment. Altogether, this Convention will always be a memorable one in the annals of the Association. Very truly, J. PARKER FISKE.

Buffalo, N. Y., Feb. 19, 1900.

A Convention Without a Dull Moment.

Dear Mr. Secretary:

I cannot refrain, in view of the great efforts which were made by you to insure its success, from congratulating you upon the splendid manner in which the late Convention of brickmakers was conducted. Aside from the practical benefits which have accrued to the guild from the association of makers from all sections of the country, and which are apparent on their face to every practical brickmaker, I wish here to voice my own sentiments, which are also, I am sure, the sentiments of all who were fortunate enough to attend, on the subject of the social features which characterized the Convention and distinguished it from the usual affairs of the kind.

I am certain that I do not exaggerate when I assert there was not a single dull or spiritless moment during the whole Convention, and the officials of the Association who had the entertainment features in charge, and the citizens of Detroit, who so ably assisted them in their efforts, should be commended without stint.

Assuring you that the time spent by me in Detroit was one of unalloyed pleasure and profit, and hoping that all future conventions may be as well conducted and as pleasant as the late one, I have the honor to remain, very sincerely yours,

Chicago, Feb. 21, 1900. MELVIN L. EMERICH.

From a Busy Absentee.

To the Editor of The Clay-Worker:

Find inclosed $2 for The Clay-Worker and $3 for membership in the N. B. M. A. I had intended to meet with the N. B. M. A. at Detroit, but could not on account of poor health.

We have manufactured 2,500,000 brick the past season, and they sold at $6.50 per thousand. About a year ago our city was destroyed by fire. The Wisconsin Chair Co. and quite a number of the business and private houses have been rebuilt. The Wisconsin Chair Co. is the largest of its kind in the Northwest. They have used about one million brick, and will use about the same amount next spring.

We also manufacture drain tile. About six years ago we bought the Little Wonder brick and tile machine from the Wallace Manufacturing Co., Frankfort, Ind., and we made the

first tile that was ever manufactured in our part of the country. They were entirely new to the people; in fact, they didn't know what they were used for. The first year we made 30,000, which was enough for three years. Now we make from 100,000 to 150,000, and have a good demand. They sell from $10 to $50 per thousand, and we make them from three to eight-inch. We have the greatest demand for three to four-inch.

We are shipping clay to Milwaukee, thirty miles south of us, which is used for boilers and steam pipe covering. The prospects for next season are very bright.

G. GUNTHER & SON.

Port Washington, Wis., Feb. 13, 1900.

Got His Money's Worth.

Friend Randall:

I have taken account of stock and balanced the ledger to see if I could find any profit balance for the time, trouble and outlay expended in attending the N. B. M. A. meeting in Detroit, and am ready to make my report, and here it is:

I find it was time well expended; it was no trouble to go, and the outlay brought more than 100 per cent. gain. We were admirably entertained by the Detroit people. The discussions and papers at the various meetings were all valuable and interesting. I got more valuable information and pointers in the lobby meetings than the cost of whole trip.

I desire to emphasize the value and importance of the report of the Committee on Technical Investigation, a copy of which was presented to each of the members. If possible, I shall continue my attendance at the conventions as long as I am in the brick business. Yours truly, F. PLUMB.

Streator, Ill.

A Deserved Compliment for the Local Committee.

Dear Mr. Secretary:

I am very glad, indeed, to say that I have none but pleasant recollections of the Detroit Convention, and this not only of the social character of the gathering, but of that part which essentially pertains to the business of the clayworker.

I fully agree with that celebrated "public kicker" who kindly addressed us on the night of the feast, that these conventions are capable of doing very much good, and that the men engaged in the several clay industries can always find profit as well as pleasure in coming in contact with their fellow-workers.

I believe that, although the National Brickmakers' Association is so successful at this day, its scope can be enlarged to advantage, and that other elements engaged in the building trades can be brought into it with advantage.

I hope that The Clay-Worker, in writing of this Convention, will endeavor to do full justice to the Detroit Committee of Arrangements, for certainly the gentlemen engaged in providing for the pleasure of the delegates did themselves and their city proud.

Hoping we may all live to enjoy many more N. B. M. A. conventions, I am sincerely yours, DAVID C. MEEHAN.

Columbus, O., Feb. 15, 1900.

A BUSY FIRM.

The Illinois Supply and Construction Co., St. Louis, Mo., write that they are exceedingly busy. The demand for their cooking table furnaces and improved methods of burning brick and other clay ware is increasing as the merits of the Grath system is known and understood. They recently equipped a number of large plants, and are getting satisfactory reports from them without exception. They are particularly pleased with the success of the Savage Fire Brick Co., Keystone Junction, Pa. In a recent letter Mr. Hoblitzell, the manager of that concern, says that their first burns were so satisfactory that they are going to change all of their kilns (forty or more in number) to the Grath system. The Ludowici Roofing Tile Co., Chicago Heights, Ill., have attached the Grath furnace to their Stuart kilns, and the result has been so satisfactory both in the saving of fuel and the improved quality of the ware that they will attach Grath furnaces to all their kilns.

As will be seen by referring to their ads. on pages 189 and 207, they also manufacture a desirable line of dry press machinery, etc., of which they will be pleased to give details to any of our readers who are interested.

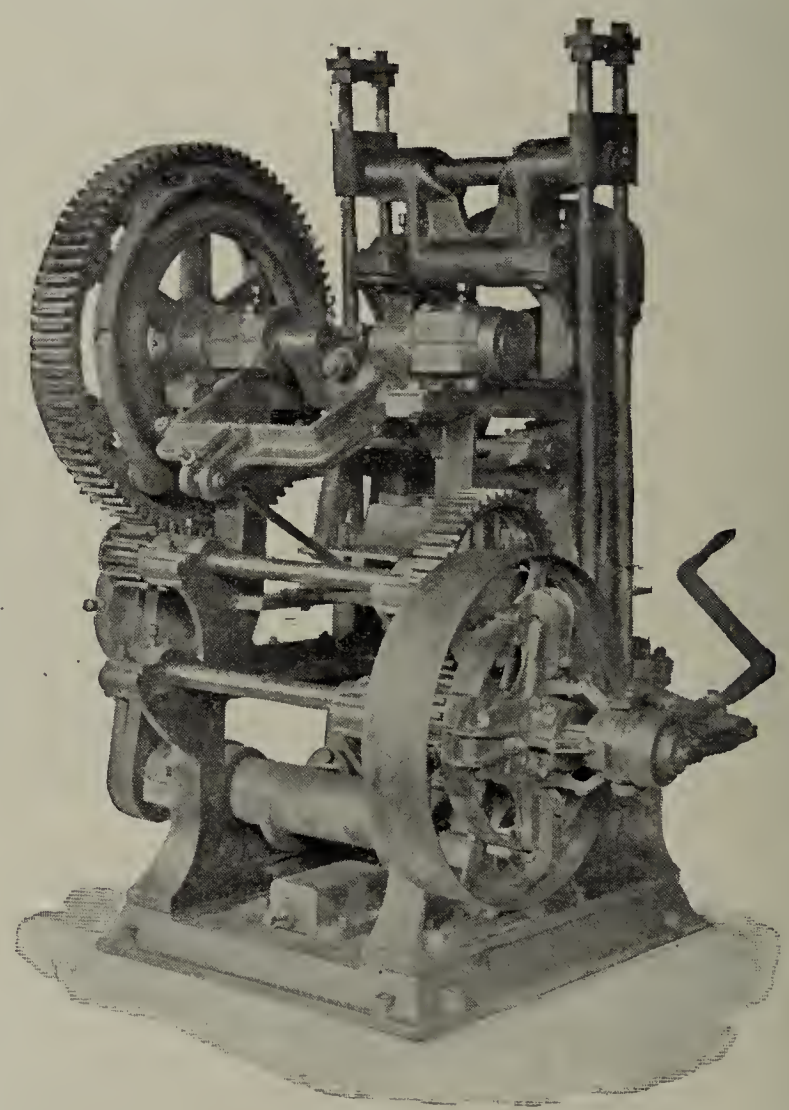
A NEW DRY PRESS.

The Ohio Ceramic Engineering Co., of Cleveland, have placed on the market a new single or double mold steam dry press that will, we believe, attract considerable attention among brickmakers.

The machine is constructed to make ornamental brick and standard and Roman brick also.

The manufacturers claim for this machine:

1. Any kind of ornamental brick can be made on face or edge.
2. Depth of mold, 8½ inches.
3. Mold frame adjustable.
4. Dies can be changed easily and quickly.
5. Brick are pressed perfectly, without seams or other blemishes.
6. Machine adjustable to wear, durable and effective.



Single or Double Mold Steam Dry Press, Made by the Ohio Ceramic Engineering Co.

7. Pressing mechanism, simple and strong.
8. Brick pressed top and bottom and "wiped" in the mold while under pressure.
9. Pressure movement long and slow.
10. Has friction clutch pulley with brake; machine can be stopped instantly in case of accident, or if it is desired to remove brick by hand.
11. Strain comes entirely on side bars.

The capacity of this machine is from ten to twelve thousand per day of ten hours.

It is fully covered by guarantees as to output and wearing qualities, and the price is unusually reasonable.

We print two illustrations, one (on back cover page) showing the front, the other (above) the rear view of the machine. The manufacturers will send full particulars.

THE EXHIBITION ROOM—HOW IT APPEARED TO AN EXHIBITOR.

IN contradistinction to the official programme, the Fourteenth Annual Convention of the N. B. M. A. was held at Detroit, Mich., the week of Feb. 5 to 10, 1900, and Detroit's reputation as a great convention city is more than established, and so say all of us.

Say, hasn't she got a Mayor! If that little address of welcome from the city, through her chief magistrate, didn't get deep under the boys' vests, then I don't want a cent.

And the Powwow! Such a Powwow! I had the gratification of sitting at one of those little tables with two new members and another old one. It was almost like "seeing yourself as others see us," with the verdict in our favor. We may have seen better days, but do not remember of ever putting in a better night. And that speech by our magnanimous and big-hearted Brother Clippert, nominating our equally big-hearted Brother Will for President, did us all proud. I am of the opinion that, had it been anybody else but Will, we wouldn't have let it go that way, and, as it was, it took that mustard-plaster story to settle it.

In the matter of exhibition room, I think there was little to be desired. It was an ideal place for the purpose, and made a "hit," being on the ground floor, of ample area, splendidly lighted, well furnished with stands, and far enough away from the Convention hall to suit both contracting parties. I can honestly assert that I did not hear one solitary complaint during the whole Convention, but rather the opposite, as I heard many expressions of gratification for the provision made.

The J. D. Fate automatic cutter held a commanding position across the end of the room, supported on the right by Cox's army of cutting wires and on the left by General Kiln Yates, the balance of the army doing guerrilla warfare. Those that seemed to do the most execution were personally led, but I noticed that there seemed an unusual demand for reading matter. The Illinois Supply and Construction Company (furnaces, kilns and dry-press machinery) Huetteman & Cramer (duplex soft-mud machines), John Moroney (Berg presses), Alsip (kiln furnaces), McDermot (ball-bearing wheelbarrow), and M. F. Williams (rock, shale and brick crusher) represented their points of superiority by beautifully made models, while others contented themselves with tasty and well-gotten-up circulars and drawings. I am so pleased with the exhibits and exhibition room this year that I would dearly like to write the whole thing up in detail, but dare not hope for sufficient space, so must content myself with a summary only, remarking, however, that the new recruits were heartily welcomed and initiated with all due pomp and ceremony. Great Scott! What a welcome Elder got, and he deserved it, too!

C. & A. Potts, Wallace Manufacturing Company, Ohio Ceramic Engineering Company, H. Brewer & Co., Freese & Co., J. D. Mock & Co., Hardin & Gary, the American Clayworking Machinery Company, J D. Fate & Co., Huetteman & Cramer, George S. Cox, the Wellington Machine Company and the Horton Manufacturing Company were the chief representatives of the plastic methods, while Chisholm, Simpson, Grath & Mitchell and Fernholtz, by W. F. Scott, handled the dry-press interests to perfection. Dryers were well to the front. The old reliable Standard, the A. B. C., the Lehman and the Hornsey and Bucyrus are all champions in their class (so announced by their backers), and ready to meet all comers. Just at this point we heard a shout of "'Ere we come," and, turning quickly, found ourselves face to face with the kiln contingent, headed by Complacent Continuous Haigh and Father New Discovery Pike, Grath and Mitchell (kiln and reputation builders), Swift (who was here first), Up-draft Reep, Down-draft Yates, Horizontal-draft Lehman, Any-old-draft Carson, Still-water Alsip, and last, but by no means least, our old friend Eudaly. By the way, how is this? On leaving Detroit, a brother brickmaker was presented with a bottle of "liquid spirits," of known quality, but forgotten age. Looking at it affectionately, with tears in his eyes and a "huck" in his voice, he brokenly cried, "Al—sip to Eudaly."

Coming back to seriousness, I must pay a tribute to the Columbus Face-brick Company, represented by Meehan, and the Garden City Brick Company, represented by T. C. Lundy, who, by the way, read a most excellent paper. The brick exhibited by these gentlemen were certainly works of art, and a credit alike to the manufacturers and our craft. There were several minor exhibits, such as pulsometers, anti-scum, Eureka and Perfection screens, cars, pallets, etc.; in fact, the ground was so well covered that any brickmaker desiring information on any point of manufacture (and their name was legion) could not but be satisfied. We were very much pleased to see so many new faces, but sorry, indeed, that so many of the old, familiar and well-loved faces were absent. Many were the inquiries, followed by sincere regrets, on hearing the various causes for nonappearance.

In conclusion, I must compliment the Detroit brethren on their tasteful badge and on their generously liberal hospitality. Their efforts to entertain never lagged from start to finish, and I know I am but a unit in these expressions.

That they may prosper in like ratio is my worst wish.

KILN-RUN.

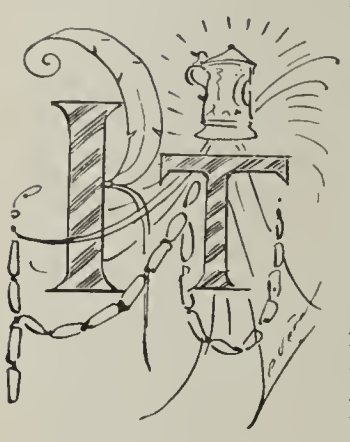
THE BADGE OF MEMBERSHIP.

The badge presented to the members of the N. B. M. A. by the Detroit brick manufacturers is one of the prettiest of the entire series, and be it known that quite a number of the members have kept the badges from year to year, and prize the collection highly. Those who were so unfortunate as to miss the Detroit meeting may have a souvenir badge for the asking, as the local committee have very generously furnished an extra lot for that purpose. Members who have not yet remitted their dues are requested to do so at once, and to state if they desire one of these souvenir badges. The accompanying illustration gives a very good impression of its appearance. The design is particularly appropriate. The medal is suspended between the stars and stripes, executed in color, and in the center is a red brick. Those who wore them at Detroit will ever associate "brick" with the name of those constituting the Entertainment Committee, for each and every one of them deserve that appellation.

AS NECESSARY AS STEAM.

To-day advertising is as necessary to the transaction of certain lines of business as steam and electricity are to machinery.—R. J. Gunning.

THE HYDRAULIC CO'S FAMILY REUNION.



IT WAS MY GOOD FORTUNE to receive an invitation to attend the annual meeting of the managers of the hydraulic press brick companies (E. C. Sterling, president, and H. W. Elliott, secretary and treasurer), held at St. Louis, Jan. 29 and 30, under the auspices of the parent company, the Hydraulic-Press Brick Company, of St. Louis. The following fifteen companies were represented, having a combined capital of over eight million dollars:

Hydraulic-Press Brick Co., St. Louis.
Chicago Hydraulic-Press Brick Co., Chicago.
cago.
Cleveland Hydraulic-Press Brick Co., Cleveland O.
Eastern Hydraulic Press-Brick Co., Philadelphia, Pa.
Findlay Hydraulic-Press Brick Co., Findlay and Toledo, O.
Illinois Hydraulic-Press Brick Co., St. Louis.
American Hydraulic-Press Brick Co., St. Louis.
Kansas City Hydraulic-Press Brick Co., Kansas City, Mo.
Kaw Brick Co., Kansas City, Mo.
Menomonie Hydraulic-Press Brick Co., Minneapolis. Minn.
New York Hydraulic-Press Brick Co., Rochester, N. Y.
Omaha Hydraulic-Press Brick Co., Omaha, Neb.
Union Press Brick Works, St. Louis, Mo.
Washington Hydraulic-Press Brick Co., Washington, D. C.
Kelley Brick and Tile Co., Wrenshaw, Minn.

In addition to the representatives of the above companies the East was represented by H. D. Lounsbury, of the firm of Fredenburg & Lounsbury, of New York city, who represent as selling agents the New England States.

Monday, Jan. 29, was devoted to an all-day session in the blue room of the Mercantile Club, with a substantial lunch served at 1 o'clock p. m. At this meeting reports were received from the various managers, covering the past season in a history of trade conditions, methods of manufacture and all the mystic terms known and appreciated only by the thorough brickmaker. Suffice to say that in regard to the year 1899 and prospects for 1900 the press brick interests bid fair to participate in the generally anticipated era of prosperity.

One important fact in relation to this meeting was that, notwithstanding the seemingly enormous interests represented, the hydraulic companies have fifty-nine competitors in the same line.

After the session at the Mercantile Club the members met at Tony Faust's at 6 o'clock, and did full justice to a dinner such as "mine host" has the reputation of furnishing, and at 8 p. m., to further lessen the cares of the general managers, the erratic legs of Jefferson De Angeles, supported by his competent operatic troupe, contributed towards a very enjoyable evening. Tuesday, the 30th, was spent in conferences at the offices of the hydraulic company, and in the afternoon Mr. W. N. Graves, superintendent of the hydraulic company, exhibited his "baby hydraulic" machine at the works. This machine is for molded brick, makes one at a time, and its value can be appreciated only by those who are in the business. The visiting members were quartered at the Southern Hotel, and there was nothing left undone that would contribute to their comfort. As I left for Chicago that Tuesday night, lazily glancing through the trestles of the Eads bridge at the lights and shadows upon the bosom of the majestic Mississippi, I could but wish for every inhabitant of St. Louis the same ecstatic condition of at peace with mankind that pervaded my entire being. By the way, referring to the Mississippi, my aforesaid peace showed slight symptoms of ruffling when I recalled the studious efforts to refrain from mentioning water, and I am afraid my statement was impugned, as upon arrival at Chicago the next day a friend asked me if I could detect Chicago sewage in the St. Louis drinking water. I had to confess that, owing to the short time I was there, only two days and one night, I had really forgotten to test it. I can attest, however, to the ability of the gentlemen connected with the Hydraulic-Press Brick Co. of St. Louis as entertainers, and should I ever have occasion to again visit the town, if only for half a day, I will take a drink of water, unmindful of the consequences. **NICODEMUS.**

Chicago, February, 1900.

A GOOD SHOWING FOR A NEW BEGINNER.

Editor THE CLAY-WORKER:

We have just closed a very successful year, considering that it is our first. We have twenty acres of land just inside of the corporate limits of this lovely little city. The clay runs from six to twelve feet deep, and is a very excellent grade, while just under the clay is a fine bed of pure sand, which we use in sanding our brick and also for building purposes. The engineer who is running a line of city sewer through our clay claims that it would make excellent sewer pipe.

We installed a new Chambers machine last April, and certainly these gentlemen make a very satisfactory machine. We take the brick from the machine and hack them under sheds. These hacks run from ten to sixteen brick high, owing to the temper of the brick when they leave the machine. Our sheds are covered with plank in such a manner that we can partially open the top at our pleasure. We expect to enlarge this system before March. At present we are burning in the up-draft kilns, and are now preparing to build a clamp with furnaces to burn either wood or coal. We can get a very good quality of coal delivered at the yard for $1.50 per ton.

We have burned and sold over two million of brick since May 1, and still have another kiln made, and will burn in a short time.

We ship quite a lot of brick to the Yazoo Delta, having sold 50,000 repressed brick to one firm at Greenville, besides many common brick.

Our clay is hard to burn, but has this peculiarity, which I am sure that some would be loath to believe: When the brick are burned they are larger than when green. We noticed this first when the heads were hot, they then being two inches larger than the center, which rises to the level of the heads when it gets hot.

We lose no brick in the eyes, which are among the best brick we have. While many lose all of the teeth brick, we save them all, and generally burn from casing to casing.

With many kind words for "The Clay-Worker," which we would not be without, and which is indispensable to any brickmaker, we beg to remain, Very truly,

Columbus, Miss., Dec. 29. COLUMBUS BRICK CO.

ECHOES OF THE CONVENTION.

Chicago, Feb. 13, 1900.

It is hardly to be expected that the delegates and visitors should talk brick, eat brick, sleep brick and have their entire being permeated with brick just because they were at a brick convention. Between sessions, it must be admitted, there were diversions, and through it all was the determination to have a good time, and, above all, keep in a stock of "good spirits"—which reminds me that the Canadian Club distillery, at Windsor, Canada, was a factor in this respect.

There is a suspicion that the "rubber stamp brigade" will find their "trademarks" turning up in the most unexpected places within the next six months. The N. A. B. stamp will advertise a strictly Detroit production. It is openly hinted that George H. Drew, J. E. Eastes and another victim paid all the pool and bowling bills of the sporty side of the delegation during their sojourn. It is also hinted that the entente cordiale existing between Charles Bonner and Thomas Moulding received a severe jounce in an unfortunate misunderstanding in regard to the home trip. But mutual explanations and a charitable interpretation of motives dispelled all traces of any differences. While some of the delegates' troubles did not commence until they reached Detroit, I have in mind the trials and tribulations of a Chicago "hustler," whose ability to reach the hearts of his friends by his wholesouled generosity is only equaled by his genius in getting mixed up in the most ludicrous situations, entirely original, and only possible under the personal direction of the "hustler" himself. On the evening of the 6th himself and his estimable wife, who was to accompany him, anticipating to the fullest extent the proposed trip, made the necessary preparations attendant upon a three days' absence from the roof tree. To forestall the plumber the water must be shut off, and at the last minute our member rushes to the basement and finds that what has been heretofore but a simple joint, with a valve or two, has suddenly developed into a complex system of valves, elbows, joints and an endless maze of pipes. After wrestling with the proposition for ten minutes, ruining

his "shine," soaking his cuffs and otherwise damaging his outward appearance, he rushes upstairs (leaving the water running full force), and finds the partner of his joys patiently awaiting him in the carriage ordered to take them to the depot. Out he goes with a rush, slams the door, and, calmly informing the driver that he has nine minutes to make the train in, feels that he has at least earned that nine minutes for a rest. Arriving at the depot, he must, of course, drop my lady's bag in a puddle concealed at the edge of the curb. But a little thing like this does not count. A rush to the ticket window for some information, and then a run for the train—leaving the umbrella on a shelf by the ticket window. At last, comfortably ensconced in their section of the sleeper, it would seem that the fates should decree that all should be well. But the madame, with that prudence so—hardly tantalizing, but, to all benedicts, apt to make one feel about a foot high, remarked that, notwithstanding the experiences of the evening, they were now well on their journey, and in the morning, in their comfortable quarters, in the luxury of divesting themselves of traveling garments for their gala attire, all would be forgotten—but "you, of course, have the trunk checks all right." To prove it, our hero proudly draws from his pocket the brass talisman, without which it availeth not with the baggage smasher. Handing them to his wife with an expression of a conquering hero, he was amazed to note the expression of her face. She could only point to the inscription on the checks, "No. 3567485, Parmelee Transfer Company, Dearborn Station. Claim your baggage." Ye gods! Nothing but claim checks! The faithful wife accepting the situation and enjoying the escapade as only an angel could, they both accepted the inevitable. A long telegram to the Chicago station, their baggage arriving six hours later, and their troubles were at an end. At their Chicago home, the next morning, our hero's business associate found the front door unlocked and gas burning. But all's well that ends well, and may the next Convention have less of the worry and a proportionate amount of happiness for both the "hustler" and his wife. VERITAS.

WHAT WE HAVE DONE AND HOW WE HAVE DONE IT

Editor THE CLAY-WORKER:

I have noticed during the last two or three months some very favorable accounts of the brick trade throughout the country, and I am happy to inform you that here in Canada we have been no less fortunate than the majority; in fact, here in Laprairie we have experienced a very good season. It was the middle of July before we got started, but it was reasonably fair weather. We managed to keep on making until the middle of December. We made over seven million, of which three and a half million were burned in continuous kilns, the rest of them being burned in the three Peerless and two Eudaly kilns, all of which done very good work. Of course, the Eudaly is well known, but the Peerless, having been on the market but a short time, is not so well known, but, nevertheless, it is a good kiln as an up-draft. I do not think it can be beat, providing the operator knows his business, and I don't think the patentee would tell a purchaser that it did not need any one with experience to run it. I do not think the kiln yet built that does not need skill to operate it. And what is more, a man may be a good burner on one kind and still have a whole lot to learn on another.

Here in Laprairie we make dry press, repress pavers and soft mud, side cut building brick, and they are acknowledged to be the best brick made in the vicinity of Montreal. We shipped all we made and several million we had on hand. The continuous kiln we have here, when first built, was a Johnson kiln, and, on account of a flue which run full length of the kiln on both sides, just below floor line, weakened the outside walls so that it was continuously spreading and letting arches down, but now the arches are turned the other way; that is, from a cross wall for every chamber through which flues are left, 9 by 24, but I do not think that is sufficient space for the fire to advantageously get from one chamber to another. Now I know from what I have read in regard to operating a continuous kiln that our system is a little different from any I have ever read about. The wall which divides one side of the kiln from another gets so hot that it causes the fire to travel much faster than on the outside, so, in order to keep both sides even, I start a fire in the wicket just as soon as it commences to show red, and continue fire until both sides are even, then put up a four-inch wall, leaving a cavity, making it what we call a double wicket; then in firing from top we commence just as soon as the bottom gets to a good red and allow the coal to go to the bottom, except what little catches on projections set in feed holes for that purpose; then as soon as the shrinkage commences, we stop up second and fourth row by dropping in lump coal, taking care not to let a lump stay part of the way down. I find lump coal better than brick bats for that purpose, because it is easier to open if you think it necessary. We have six rows of feed holes to a chamber; we fire to the bottom of four. I find that from as good a system as we have we get good hard brick from bottom to top. Now I have one objection to such small spaces through the cross walls, for the reason that the air which follows the fire circulates directly along the bottom, necessitating heavy back firing to keep cold air back. But coal so used is not wasted at the back, and serves the purpose of a gas generator, so you see if coal is put in back and burned up clean there is no waste of fuel.

GEO. E. DERRY.

GREETINGS FROM PHILADELPHIA.

OF COURSE, I have to open this with a few figures; can't get away from it. Women, buildings and New Year letters must have figures, or they "cut no ice."

The common reports say the past year has been pretty good. Brickmakers and terra cotta and tile men speak favorably except, perhaps, the latter. Tiles of the beaver kind sell better just now than those from Akron, O. However, that's not what I started out to write. You all know that the more buildings erected the more bricks are wanted generally. Yes, very generally.

I'm sorry to have to report an awful slump in the number of building operations the past year and the cost, to wit, that were erected in and around the suburbs of this city:

New buildings.....10,250.....cost $31,276,739.....year 1898
New buildings..... 3,877.....cost 15,973,846.....year 1899

These figures, showing a decrease of nearly sixteen million dollars in the past year, must necessarily affect the brick trade. Yet, notwithstanding, nearly 230,000,000 were made last year, and sales and orders placed leaves less than 25,000,000 standing in the yards, and our brick men are far from despondent.

In spite of the efforts made by the local agents, the sale of tiling has not increased. The people have yet to be taught the wholesome advantage of the tile, and the conservative man and city cling tenaciously to slate.

Face brick, which, according to Mr. Mack, of the Eastern Hydraulic Brick Co., should represent pro rata about 10 per cent. of the common sales, have been but fairly supported during the past year. Buffs, grays and Pompeiian still reign, however, as favorites.

Genial Mr. Mack, seated beneath the shadow of his Clay-Worker calendar, said: "The big decrease in the building trade is due to the more stringent lines enforced by the building bureau and the banks upon the operative builder. This is essentially a city of homes, and this accounts for so few apartment houses being erected, when compared with New York and other cities. However, the outlook for 1900 seems bright, and I trust it will continue, but I can better tell you on the 31st of December next." Kindly inquiries and greetings for all along the line, and reciprocating the good wishes for The Clay-Worker, we shook hands and parted.

The Equitable Brick Co., at Sixtieth and Pines, report a fairly good year, and, says Mr. Kimball, "we're still hustling, so there's very little of the summer dust clinging to our clothes."

Murrell Dobbins, the well-known brick manufacturer of this city, has purchased the extensive Lyons Pottery Co.'s works, located in South Camden, N. J. This is one of the best equipped and most widely known plants of its kind in this section of the country expressly adapted for the manufacture of sanitary ware and vitreous China. The buildings cover an area of over two acres of ground, and were built by the late James H. Lyons, who, for several years, was extensively engaged in that line at Trenton, N. J. The works are to be started right away, and several hundred men will be given employment. Walter Lyons, who was associated with his father in the business, will remain in connection with the new works. Mr. Dobbins intends to erect additional kilns for the manufacture of buff, Pompeiian and other ornamental brick. I left with a load of the season's greetings to The Clay-Worker and an invitation to inspect the new plant at my early convenience. The harder the frost upon that silken moustache of Mr. Dobbins, the softer and kindlier are the sentiments expressed toward him by everybody around. So here's to the success of his new and old standby. MITSCHKA.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place. T. A. RANDALL & CO., Indianapolis.

XXXIII. FEBRUARY, 1900. No. 2.

CURRENT COMMENT.

The trite saying that you cannot hope to please everybody is confuted by the Detroit Convention, where everybody seemed to be more than pleased. We did not hear a solitary complaint or criticism.

* * *

We congratulate the members of the N. B. M. A., as well as Mr. Gates, on his election to the presidency. No member of the Association more earnestly endeavors to advance every branch of clayworking, and no individual is more beloved by his fellows than our Button-Hole Gates.

* * *

The technical feature of the Convention, Prof. Orton's report of the work of the Committee on Paving Brick Tests, an abstract of which is given in the Convention proceedings, is a very valuable contribution. The report in full, with engravings of all the charts, will be published in book form later on.

* * *

The visiting ladies were cared for in a very satisfactory manner by the wives and daughters of the local members. At no former Convention was this feature more successfully carried out. There was not a dull hour for the visiting ladies —there were about thirty of them—from the time of their arrival until their departure.

* * *

President Richardson's address was scholarly and comprehensive, and was an index of the spirit of the proceedings which were to follow. We may speak of this address in the same spirit as we have considered the progressive qualities of the Association. Each meeting has its own standards, which are a little higher than those that have preceded. The President's address was fully in keeping with the character of the Convention itself.

* * *

It was a common remark that the accommodations of the Convention in Detroit were the best we have ever had. This is said without in the least disparaging anything which has been done before. The Association was in a position to demand more than ever before, and its demands were met fully. The hotel accommodations, the rooms for the meetings and for the banquet, were ideal in every respect. The surroundings were beautiful and adequate.

THE SILENT MEMBER SPEAKS.

There has always been a feeling in previous Conventions that there was a silent force which, if expressed, would add very largely to the interest and value of the meetings. At Detroit a number who have sat in silence through former Conventions, content to receive but unprepared to give, threw aside this spirit, and entered into the discussions in a manner that led many of the older members to wonder why they had remained silent so long. Several of the erstwhile silent members became "star performers," and we trust their example will be emulated by others in the future.

DETROIT HOSPITALITY.

One of the chief secrets of the success of the Detroit Convention was the cordial manner in which the people of that city devoted themselves to the pleasure of their guests. Mayor Maybury's address of welcome was not of the perfunctory sort, but was so earnest and kindly in tone, and evinced such marked ability, that it made a deep impression. But it was the brickmakers of Detroit, who, by their constant attendance and manifest interest in the welfare of the Association and its members which made the social side of the Convention so pleasing, that not one of those who participated but will be glad of an opportunity to again visit Michigan's metropolis.

THE POWWOW.

One of the distinguishing and inseparable features of the National Convention has always been the powwow. It is the climax of the social side of the organization, and it has always been a question how to make each succeeding powwow a little different from preceding ones. The ingenuity and resources of the local committee were fully equal to the occasion, and resulted in one of the most enjoyable functions in the history of the Association. It was neither a banquet nor a smoker, but a happy combination of each. There was an abandon or freedom from restraint which delighted the unconventional, and yet there was enough of formality to please those who stickle for dignity and decorum. There were but few formal speeches, but they were all good. Toastmaster Stevens, Governor Pingree, President Gates and Col. Purington were each in turn listened to attentively. They would each of them do honor to any state occasion. What followed after is related in another column. Suffice it to say that the Detroit powwow was a hilarious success.

THE LAST CONVENTION THE "BEST OF ALL."

In point of attendance, in the interest shown and the results accomplished, the Detroit Convention was one of the best ever held. We have been able to say as much of almost every Convention, but it has never been said in a hackneyed spirit. All N. B. M. A. meetings have been equal to the demands of the time. The earlier Conventions could not, in the nature of things, rise to the point of excellence which is shown in the proceedings of this year's meetings. Each

epoch has its needs, and when we are able to say that through the spirit of the meetings, as shown by the printed records, these means have been met, we are justified each time in saying that "this Convention is the best of all." The spirit of progress has been dominant in all of our annual gatherings. The meeting at Detroit demonstrates this. When every one goes away satisfied, when those most interested have analyzed the proceedings and find no weakness, nothing slurred over, nothing done which would have been better undone, there is good cause for congratulation. There is no one to be congratulated as the moving spirit—we speak of the spirit as the body. Each individual member has done his work. Each went there with a certain ideal, and no one departed in a fault-finding humor. It may be in the future that higher and larger requirements will be a part of the demands of the National Brick Manufacturers' Association. The fact that one meeting has been a great success, and has left every one satisfied, does not mean that it should form a pattern for subsequent gatherings. Each Convention has its own problems. That at Detroit was a satisfactory one in bringing up to date all the work and experience of clay-workers which may be spread upon the public records.

YOUNG MEMBERS TO THE FRONT.

Never before in the history of the N. B. M. A. have the younger members come to the front as they did at Detroit. The acquisition of "new blood" was one of the most gratifying features of the Convention. No body of men can afford to rest content with past achievements. New thought and new life must be brought into any organization to prevent decline. No matter what the strength of the old members may be, no matter how much interest they may take or how much energy they may display, recruits are always necessary. That there was such a goodly number at Detroit is very encouraging indeed. The younger men who stepped to the front showed they were equal in knowledge as well as enthusiasm to the ideal which had been set by the moving spirits of the past. The older members were there, and made their presence felt at every stage of the proceedings. This is as it should be, but it is very reassuring to see so many bright and forceful recruits added to the membership roster.

THE PAVING PROBLEMS.

One of the most important sessions of the Convention was that devoted to the paving brick interests. There was a time in the history of paving brick when certain excuses and apologies had to be made in connection with the use of this material. Those who have been foremost in introducing this product have always realized its possibilities, but they have had many difficulties to overcome, not the least of which was the establishment of a standard quality of product. This has been accomplished. The manufacture of paving brick is no longer an experiment. Formulas have been deduced and methods have been accommodated thereto in a manner which makes it an established industry in which there is no question as to the proper methods to be pursued in developing that which is satisfactory and reliable. The manufacturers of paving brick now know definitely the character of product required, and, thanks largely to the N. B. M. A., are prepared to furnish it and to prove that it is just what it is claimed to be—the equal, if not the superior, of any paving material on earth.

OTHER CONVENTIONS.

The American Ceramic Society had a series of very successful meetings at Detroit. The membership is small, but they make up in earnestness and enthusiasm what they lack in numbers. Nearly every member of the society either presented a formal paper or discussed informally the papers that were submitted, and the proceedings when compiled will be found to contain a vast amount of very valuable information. The following is a list of the officers elected for the ensuing year: President, Carl Langenbeck, Zanesville, O.; vice president, Charles F. Binns, Trenton, N. J.; secretary, Prof. Edward Orton, Jr., Columbus, O.; treasurer, S. G. Burt, Cincinnati, O.; senior manager, W. H. Zimmer, Wheeling, W. Va.; second manager, Samuel Geysbeek, Denver, Col.; junior manager, Prof. H. A. Wheeler, St. Louis, Mo.

It was agreed to hold a midsummer meeting early in July, but the exact time and place was left to be determined later on. The next regular annual meeting will probably be held in conjunction with the N. B. M. A. Convention, as heretofore.

—The Ohio Brick, Tile and Drainage Association.—

The twenty-first annual meeting of the Ohio Brick, Tile and Drainage Association was held at Columbus, O., Feb. 13 and 14. The attendance was quite satisfactory, the membership roster showing an enrollment of some 41 members. The usual quota of interesting papers was read, all of which are promised us for publication in a subsequent issue. The members reported a fairly satisfactory trade condition throughout the State, the demand for both brick and tile being nearly equal to the capacity of the plants now in operation.

The following are the officers elected for the ensuing year: President, J. W. Everal, Westerville, O.; vice president, W. C. Wilson, Brice, O.; treasurer, E. A. Bigelow, New London, O.; secretary, Ed F. Darnell, Grove City, O.

—The Iowa Convention.—

The brick and tile manufacturers of Iowa met in annual convention at Mason City, Ia., Jan. 17 and 18, and carried out the programme published in full in previous issues of The Clay-Worker. The attendance was large, and a thoroughly good time was enjoyed by all the visitors, thanks to the untiring efforts of the local committee, under the direction of O. T. Dennison. A very interesting report of the convention has been prepared for our columns by Mr. D. W. Stookey, and will appear in our next issue. The members reported a prosperous season, with prospects of still busier times the coming year. The next meeting will probably be held at Ames, Ia., where the State Agricultural College is located.

The officers elected for the ensuing year are as follows: J. B. McHose, Boone, Ia., president; D. W. Stookey, Cedar Rapids, Ia., vice president; Robert Goodwin, Jr., Redfield, Ia., secretary; F. A. Stevens, Mason City, Ia., treasurer.

TREMENDOUS BRICK TRAFFIC.

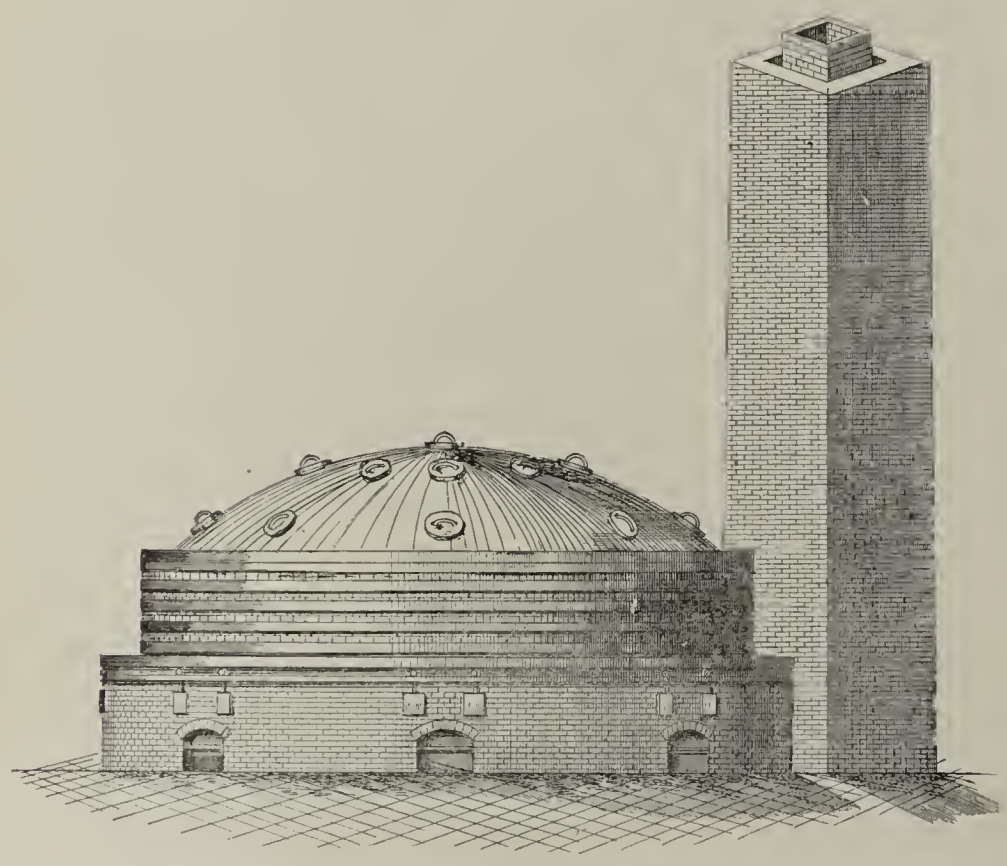
The greatest train of brick in the world, according to the Pittsburg (Pa.) Post, could be formed in the Pittsburg district out of loaded cars now standing in the various yards. It is estimated that there are at present 2,000 carloads of brick in sight, and at least 600 of these are in the vicinity of Homestead. Such a tremendous brick traffic as has been handled here during the past ten months, and is still being moved, was never equaled in the world before. Brick mean building and the enormous shipments are an indication of the great boom which

has struck the manufacturing industries of the Monongahela valley. The building boom does not end at Homestead or Oliver, as the Pittsburg & Lake Erie people reported an unprecedented activity at Monessen and other points along the Monongahela division, and Vice President and General Manager Col. J. M. Schoomaker has such great faith in the towns and industries along that part of the road that he has decided to make the Monongahela branch the main line and the Youghiogheny branch, formerly the main line of the P., McK. & Y., is to be a subsidiary branch in the future.

If all the loaded cars of brick in the Pittsburg district were placed in one train they would reach from the Union Station at Pittsburg to Bessemer, a distance of eleven miles.

SPLENDID RESULTS OBTAINED WITH THE GRATH GAS AND COKING FURNACE.

The Grath furnaces are making a record for themselves at the works of the Savage Fire Brick Co., at Hyndman, Pa. This company has adopted these furnaces at all three of their plants for burning high-grade fire brick and silica brick. The latter brick require a very great heat, of 4,000 degrees Fahr., which temperature is easily produced and obtained by the



An ordinary Kiln with the Grath Coking Furnace Attached.

Grath furnaces. The company reports that they produce better results with the use of slack coal in the Grath furnaces than with lump coal in the ordinary furnaces. They use the same amount of fuel, ton for ton, but burn 7,000 more brick in each kiln than formerly, and in addition the ware is sounder and has a better ring to it. They claim that it is the greatest invention ever made for burning either brick, lime or cement. This furnace has proven a success where another style of coking furnace proved a failure at the same work. The Savage Fire Brick Co. will cheerfully give any further information required in regard to these furnaces.

A DISASTROUS FIRE.

Friday night, Feb. 9, fire broke out about 9 o'clock in the southwest wing of the Brooklyn Fire Brick Works, bounded by Van Dyke, Richards, Beard and Van Bruret streets, Brooklyn, N. Y., and by 12 o'clock that wing was completely destroyed, occasioning a loss of about $40,000, only partly covered by insurance. The retort, stove lining stock and office building were saved, as were also the engine and boilers, and although it will take months to rebuild, yet with their old-time energy and ability temporary construction will at once be made that will enable them to fill all orders with only the loss of a few days.

These are the works originally constructed by J. K. Brick & Co., and upon the death of Mr. Brick, many years since, the name was changed to E. D. White & Co., and so remained until about five years ago, when it was incorporated under its present name, and it is at these works that the first retorts were made from clay for the manufacture of gas, iron retorts having been used previously, and they have enjoyed up to the present time a reputation second to none for the manufacture of high-grade fire clay goods.

AN OLD TIMER.

We met an "old itmer" a few days ago. He said: "I was a clayworker once. I don't subscribe for THE CLAY-WORKER, but I see one once in a while—a friend of mine takes it. I see a great deal in it relating to the chemistry of brickmaking and a great deal of stuff that I do not know anything about—then I took a look at the brick you produce. Now these brick are not any better than the brick I have made by hand. I have been making brick forty years—I have put them in buildings, and the buildings are standing to-day. They are substantial, strong, and look well. I think there is a great deal of nonsense about what has been going on. These fellows hold conventions and wear silk hats, long tailed coats and patent leather shoes—and they are not the fellows who make brick. I don't care anything for them—they are the people who have been making cheap brick—they have broken the market. I used to sell brick for $10 to $12 per thousand—and I paid my men good wages—did not have to make many brick to take care of the folks, pay the grocery bills and do well, but when these fellows come in with their talk of the chemistry and a whole lot of other stuff I don't understand, they began to make cheap brick. I am dead tired about these things. They think brickmaking is a sort of factory business and any fellow who has a little money can hire a chemist or some sort of scientist and go ahead and make brick, and when they get a lot on hand they have to sell them, and to sell them all they have to sell them cheap. That means the fellows who have to work to make their brick have got to compete with people who have money to lose."

This is one view of the case. We have no doubt that the old brickmaker who spoke on this question felt himself badly abused, and on the other hand we are sure the situation has justified what has been done. Brick are, of course, made on scientific principles. We happen to know that this particular brickmaker used to burn a kiln of brick in the fall and that he sold the same the next spring, and it would be June of the following year before he would have a new kiln to turn out. Now, of course, brick have to be made the year through. Brick are in demand in winter as well as summer, and the demand has to be kept up with. Of course, there are not as many brick sold in the winter as in the spring and warm months, but there is a demand for brick the year round, and it has ceased to be a roadside industry—it is now a question of factory methods. Brick have to be made when people want them. The chemistry of brickmaking and all the scientific and technical methods which have been applied to it, while they have reduced the cost of brickmaking, and while they have reduced the cost per thousand, have changed the brickmaking business from an industry in which many might engage in a small way. It is also true that the methods which existed a few years back could not begin to supply the demands of the present time.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

Written for The Clay-Worker.

WHEN I MADE BRICK FOR PURINTON.

When I made brick for Purinton 'way back in '88,
I had more sand in my brogan and hair upon my pate.
I knew more things that wasn't so than any man you know,
To corns and brains on either end I'd just begun to grow.
I knew that men and mules were made for dirty work and rough,
And when they lammed the mules and slighted me I thought it tough.
I used to cry for harder work, and when the boss forgot
And failed to jaw me twice a day I mourned my woeful lot.
I used to lie awake till morn to think of work to do,
And wept a sight at eight at night to think that I was through.
But when the boss he kicked me hard, how quick it did elate,
When I made brick for Purinton 'way back in '88.

When I made brick for Purinton 'way back in '88,
He drove us out at break of day and let us in quite late.
I knew it was quite wrong for us to waste six hours in sleep,
And asked for light to work all night. The boss was moved to weep.
And when I said it was a crime to waste one hour each day
In stuffing three square meals in men I thought I heard him pray.
"Why not," said I, "this system try (since sleep we must and will),
Make appetite till late at night and then to eat our fill,
And then, again, 'tis waste of men, these long walks to the bed.
Why not just lie here 'neath the sky and build a sleeping shed."
The blithesome kick he gave me quick (I smile as I relate)
When I made brick for Purinton 'way back in '88.

When I made brick for Purinton 'way back in '88,
The princely price he paid to us it did my feelings grate.
When once a month he came along and gave us fourteen bones,
A mile from there it jarred the air the sadness of our tones.
"Take back your gold and give us mud," we yelled with all our might,
But sweetly, softly Silas smiled and vanished out of sight.
Ah, good old days of simple ways, we sigh for you alack,
'Tis sad our plight, but honor bright, we would not have you back.
These times are given o'er to wiles of wicked men and shrewd,
Of shorter days and factory ways and others quite as rude.
The man and mule no longer rule as then as I relate,
When I made brick for Purinton 'way back in '88.

Since I made brick for Purinton 'way back in '88
I've corn crops on my fertile feet and town lots on my pate.
And thoughts uneasy stir me as I think upon the mule,
His patience and his kindly sense, he never killed a fool.
If intellect and honest toil e'er raised a creature high,
I'd see him rule a syndicate of brickyards e'er I die.
But woe is me, it cannot be, the mule and I stand pat,
A big steam donkey has his job, while I have gone to fat.
And should those days come back again, how hugely I'd delight
To bribe the mule to recklessness and kick me out of sight.
That was my surest way to rise (I see it now too late),
When I made brick for Purinton 'way back in '88.

BRIAN J. DUNN.

Written for The Clay-Worker.

THE PASSING OF THE ESQUIRE.

Aaron Jenkins, Esq., manufacturer of brick,
Never would descend, he said, to any low-down trick.
If Smith and Jones and Blinkins, his opponents, wish to, why,
He'd let them eat their livers out and then he'd watch 'em die.
For Aaron Jenkins, Esq., used to say it oft and long,
"If I made brick like Jones I'd sell 'em for a song."
And as for brick that Blinkers made—he swore it with a swear
He'd never dare to offer them "in market, sir, by gum."
And Smith. The very thought of Smith made Aaron snort, haw, haw,
Those brick of Smith were simply a defiance of all law.
And Aaron Jenkins, Esq., being an active man of trade,
He talked with every contractor in sunshine and in shade;
And gave them confidential tips on how they ought to shun
His neighbors Blinkins, Jones and Smith; and then he'd just begin,
"Now here," said he, "you want your brick, you want them square and nice,
I've got the only first-class brick, we won't kick on the price.
Go round among the others, get their figgers, and, I guess,
To save you from their frauds I'll sell you mine a quarter less.

Horatio Nelson Smith, Esq., another man of brick,
Despised his three opponents for their mean, dishonest tricks.
And he, too, saw the contractors, and much the same he said
As that which Aaron Jenkins had first put in their heads.
And Stephen Decatur Blinkins, Esq., no less than all the rest,
In quiet warned the buyers that his brick alone were best.
And both made plain, it was their hopes, to part with their's at cost,
That sinfulness might be rebuked nor honest trade be lost.
But simple Smith, he held his tongue, likewise his price he held,
And kept his strikers busy and his brick stacks on the build.
His eyes upon his own he kept, and made brick sound and square,
With that firm hope that purchasers await all honest ware.
And soon a strange thing soon was plain to each of this quartet,
Three esquires are in bankruptcy, but Smith is thriving yet.

TABLE OF CONTENTS.

OFFICIAL REPORT.

The Opening Prayer..... 103
President's Annual Address.. 103
Treasurer's Report..... 106
The Election of Officers..... 106
The Installation of Officers... 109
Progress and Prosperity 109
Cincinnati Wants the Convention..... 110

SECOND SESSION.

Business Methods in Clayworking..... 113
The Clay Age 114
The Man Behind The Pug Mill 117
Tempering Clay an Hundred Years 119
Do We Make the Best Use of Our Clay Banks?..... 119
What Causes Stiff-Mud Brick to Blister? How May It Be Avoided?..... 120
Is There any Advantage Gained by Using Warm Water for Tempering or Pugging Clay? 121
Do Not Brick Sell at a Lower Value Than Any Other Building Material?..... 121

THIRD SESSION.

Discipline and Courtesy in the Brickyard..... 121
Setting Brick in Kiln or Kiln Drafts 123
Drying Brick with Heat From Cooling Kiln..... 124
Report of Committee on Trade Relations 127
Is There Any Economy in Using Exhaust Steam For Drying? 129
The Committee on Resolutions..... 132

FOURTH SESSION.

Brickyard Pilgrimages..... 132
The Market Side of The Paving Brick Industry..... 132
Construction of Brick Pavements 134
Report of Committee on Prof. Orton's Investigations of Standard Methods of Testing Paving Brick..... 141

FIFTH SESSION.

Report of the Committee on Technical Investigation..... 142
Kiln Experiences..... 142
Down-Draft vs Up-Draft Kilns For Burning Common Brick 144
The Continuous System of Burning..... 146
Report of Committee on Resolutions..... 151
Letters From Absent Members 153
The Powwow..... 153
List of Members N. B. M. A. 1900 154
Executive Committee..... 155
Ex-Presidents 155
Committee on Technical Investigation..... 155
In Memoriam 155
The Saturday Outing..... 172
Convention Echoes..... 172
A Five-Year-Old's Impressions..... 172
The N. B. M. A. a Great Educator..... 172
The Convention an Agreeable Surprise 173
Excelsior Says One Who Has Attended Every Convention 173
The Enthusiasm of a New Convert..... 173
A Delegate Who Was Put Off at Buffalo..... 173
A Convention Without a Dull Moment..... 173
From a Busy Absentee 173
Got His Money's Worth..... 174
A Deserved Compliment for the Local Committee..... 174
A Busy Firm..... 174
A New Dry Press..... 174
The Exhibition Room..... 175
The Badge of Membership..... 175
The Hydraulic Co's Family Reunion..... 176
A Good Showing for a New Beginner 176
Echoes of the Convention..... 176
What we Have Done and how we Have Done it..... 177
Greetings from Philadelphia... 177
Pacific Coast News..... 184
Obituary 184

EDITORIAL:

Current Comment..... 178
The Silent Member Speaks..... 178
Detroit Hospitality 178
The Powwow..... 178
The Last Convention the "Best of All"..... 178
Young Members to the Front .. 179
The Paving Problems..... 179
Other Conventions..... 179
Tremendous Brick Traffic..... 179
Editorial Notes and Clippings 186

MISCELLANY:

Splendid Results Obtained with the Grath Gas and Coking Furnace 180
A Disastrous Fire 180
An Old Timer..... 180
When I Made Brick for Purinton..... 181
The Passing of the Esquire..... 181
American Oil Filters Appreciated Abroad 184
A Peculiar Accident..... 184
At the Paris Exposition..... 188
The Berg Not An Infringement..... 188

Index to Advertisements on Front Inside Cover Page.

SAVE THE DROPS

"We are able to use our waste oil over and over and it is entirely free from cement, grit, etc., after passing through our

CROSS OIL FILTER.

It is a remarkable oil saver."

BONNEVILLE CEMENT CO., Siegfried, Pa.

Used by the largest Brick and Cement plants in the world. SENT ON APPROVAL.

Write for Catalogue 43.

Burt Manufacturing Co., AKRON, O. U. S. A.

Largest manufacturers of Oil Filters in the World.

Clay Workers MANGANESE.

CRUDE, GRAIN AND GROUND.

BOOKLET ON THE MATERIAL, ITS USE AND COST, FREE.

KENDALL & FLICK,

618 Penn. Ave. N. W., WASHINGTON, D. C.

RAYMOND

BRICK MACHINERY

Where it is Used.

In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

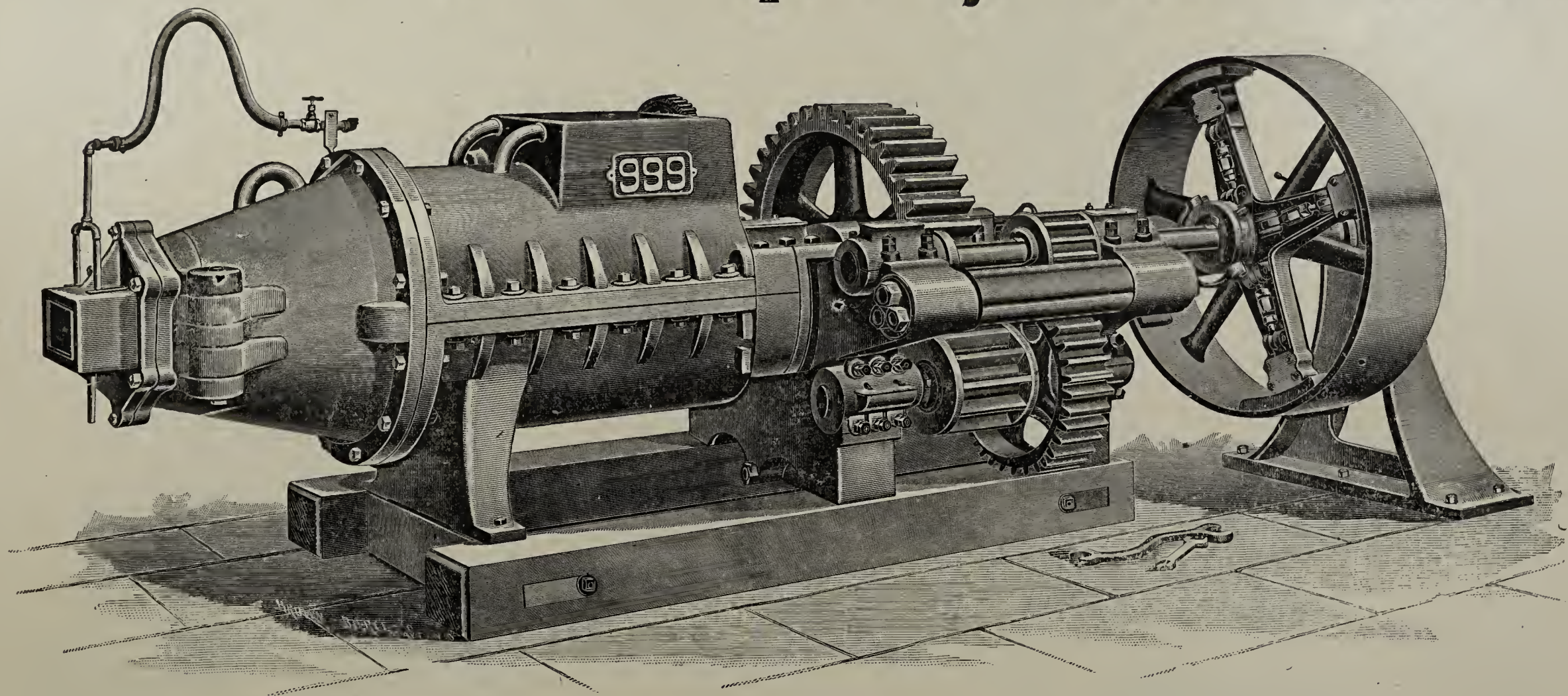
RAYMOND BRICK MACHINERY is now used and in daily operation the world over. Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine.

Our great success has not been obtained without merit. Buy Raymond's and you get the best.

The C. W. RAYMOND CO.

DAYTON, OHIO, U. S. A.

Raymonds Large Capacity Brick Machine.



"Looks are nothing, behavior is all," is just as true of brick machines as of mortal clay. The above cut shows that our 999 machine is a good looker, and in operation it is even better than it looks. The very embodiment of strength, it is the machine for those who want to increase the capacity of their plant, while for the making of paving brick from tough shales it is par excellence. Its great power makes it possible to make good pavers from shales that can not be worked successfully in ordinary auger machines. This machine has many good points which we will gladly enumerate in detail to every brick maker who is interested.

Address,

We also make a variety of superior Represses, Cutting Tables, Clay Grushers, Pug-Mills, Tempering Wheels and all kinds of Brick Yard Supplies.

Write for new Catalogue.

The C. W. Raymond Co.,

Dayton, Ohio, U. S. A.

PACIFIC COAST NEWS.

THE BRICK AND TERRA COTTA people report a very quiet season, with no contracts of note, the principal work being of a small character, which, of course, aggregates enough to keep the business moving. There are several large pieces of work in prospect, but it is too early yet to say anything about them, because there is not enough definite information on hand to give out. The general trade conditions of California and the Pacific coast are very good, and it can truthfully be stated that the year 1900 has opened up under more favorable circumstances than any of its several predecessors.

S. F. McKenzie, of McKenzie Bros., Vancouver, B. C., states that it is probable that works will be established in Vancouver at an early date for the manufacture of white pressed bricks. The details are not ready for publication yet, but will be in a few days, when Mr. McKenzie returns from a trip to Victoria.

The brickyards of the Denny Clay Co., at Seattle, Wash., are to be moved from First avenue and Jackson street to the Maynard addition. The company has secured a permit from the city engineer to drive piling and build a wharf, at a cost of $3,000, on the new site.

F. Singleton, of Walla Walla, Wash., contemplates an increase in the capacity of his brickyard during the coming season.

The administrator of C. J. Hutcheson & Bro., formerly brick manufacturers at Tacoma, Wash., has been discharged.

H. M. Abbott, of Salt Lake City, Utah, is in Boise, Idaho, looking over the field, with a view of establishing a plant for the manufacture of pressed brick. He is interested in the Salt Lake Pressed Brick Co., and purposes bringing to Boise a superfluous plant owned by that concern. The plan is to organize a company to establish and operate the works. Mr. Abbott has investigated the market, and finds that there will be a market for 2,000,000 brick this year to fill the demand created by building plans already formed, while the total may be considerably increased as the season advances. Mr. Abbott has secured subscriptions to two-thirds of the stock of the proposed company. The company will be known as the Boise Pressed Brick Co., and the plant will be located at the head of Harrison boulevard. Mr. Abbott states that he has found a bank of fine fire clay that is within reach, and from which all the fire brick needed in that section can be manufactured.

The question of paving the avenues of Spokane, Wash., with brick rather than asphalt is being seriously considered by the officials of that city.

L. D. Boyd will start his brickyard at Hood River, Ore., in the spring, just as soon as the weather will permit. He has purchased the brickmaking machinery of Robert Rand, and has leased ground three-quarters of a mile east of Hood River. He will burn a kiln of 400,000 bricks.

The Chicago-Seattle Brick Co. has been formed at Seattle, Wash., and has leased a tract of land in South Seattle, near the yard of the Seattle Brick and Tile Co. J. Gourley is at present managing the company.

Hill & Brown are burning a kiln of 200,000 pressed brick at Las Vegas, N. M.

An important result of the long season of open weather with which the winter has opened is the progress that has been made in building operations in Spokane. There is more brick work being done on Spokane buildings now than at the same season in any previous year in its history, and were it not for the scarcity of material the amount would be largely increased, as many buildings are already planned, and are only waiting for brick for the commencement of their erection. The demand for brick in that section has advanced the price recently from $7 to $10 and $11 per thousand, and no weakening is expected until spring brings new shipments.

A brick trust was recently formed in Los Angles, Cal., which controls four out of the seven brickyards in and near the city. It is claimed that bricks have been selling in some cases at prices that leave little or no profit. The members of the trust deny that there will be any material advance in prices. In any case, the fact that a firm owning three yards is outside of the trust should insure competition. The members of the new company are said to be W. F. Botsford, M. H. Newmark, Samuel W. Newmark, Phineas Newmark, J. F. Sartori, M. S. Heilman, Henderson Hayward, A. H. Conger, T. E. Newlin and George W. Peck. The combine has purchased the plants of the City Brick Co., owned by Thomas Goss and A. A. Hubbard, located in the Chavez ravine, near Buena Vista street, and also on Mission road and Magnolia avenue. They have also secured the yard of Ed Simons, in the Chavez ravine, and the yard of R. G. Simons, on East Seventh street. It is stated that they will also acquire in a few days another yard in the Chavez ravine. The Pacific Brick Co., which has yards at Boyle Heights, Inglewood and Pasadena, Cal., has not gone into the combine, and declares that it will not do so. There also remains on the outside the yards of C. V. Paye and H. Jensen and several small yards. The company has a capital stock of $500,000. The officers of the new company are: W. F. Botsford, president; M. H. Newmark, vice president, and T. E. Newlin, secretary and manager.

The Washington Brick and Lime Co., at Clayton, Wash., will soon erect a manufactory at that place for the making of culvert pipes. It will also have a press for making sewer pipes of all sizes. The company will also have a new brick press near Mica, Wash., which will be the largest in that section. Both plants will be ready for operation in the early spring. SUNSET.

San Francisco, Cal.

OBITUARY.

ON SATURDAY, Feb. 10, there departed from this world, at his home, in Reading, Pa., George J. Eckert.

Mr. Eckert had passed his three score and ten years, and until less than a year ago was in vigorous health. Then liver trouble set in, and, although about his business as usual, cannot be said to have had his old-time vigor. Mr. Eckert was by profession a lawyer, but having invested some money, with others, in the manufacture of fire brick, not intending at the time to abandon his profession, he finally drifted into the ownership and sole control of the works, and for many years that has been his sole occupation. He was a man of sterling integrity, and respected by all who knew him. He leaves a widow, two sons and two daughters.

AMERICAN OIL FILTERS APPRECIATED ABROAD.

The Metropolitan Electric Supply Co., of London, England, one of the very largest electrical concerns in the British empire, has recently placed an order for four ninety-gallon Cross oil filters, manufactured by the Burt Manufacturing Co., of Akron, O. These are for use in their stations.

The British government has also been a large buyer of these goods during the past year, notwithstanding the fact that the English makes are both plentiful and cheap.

A Peculiar Accident.

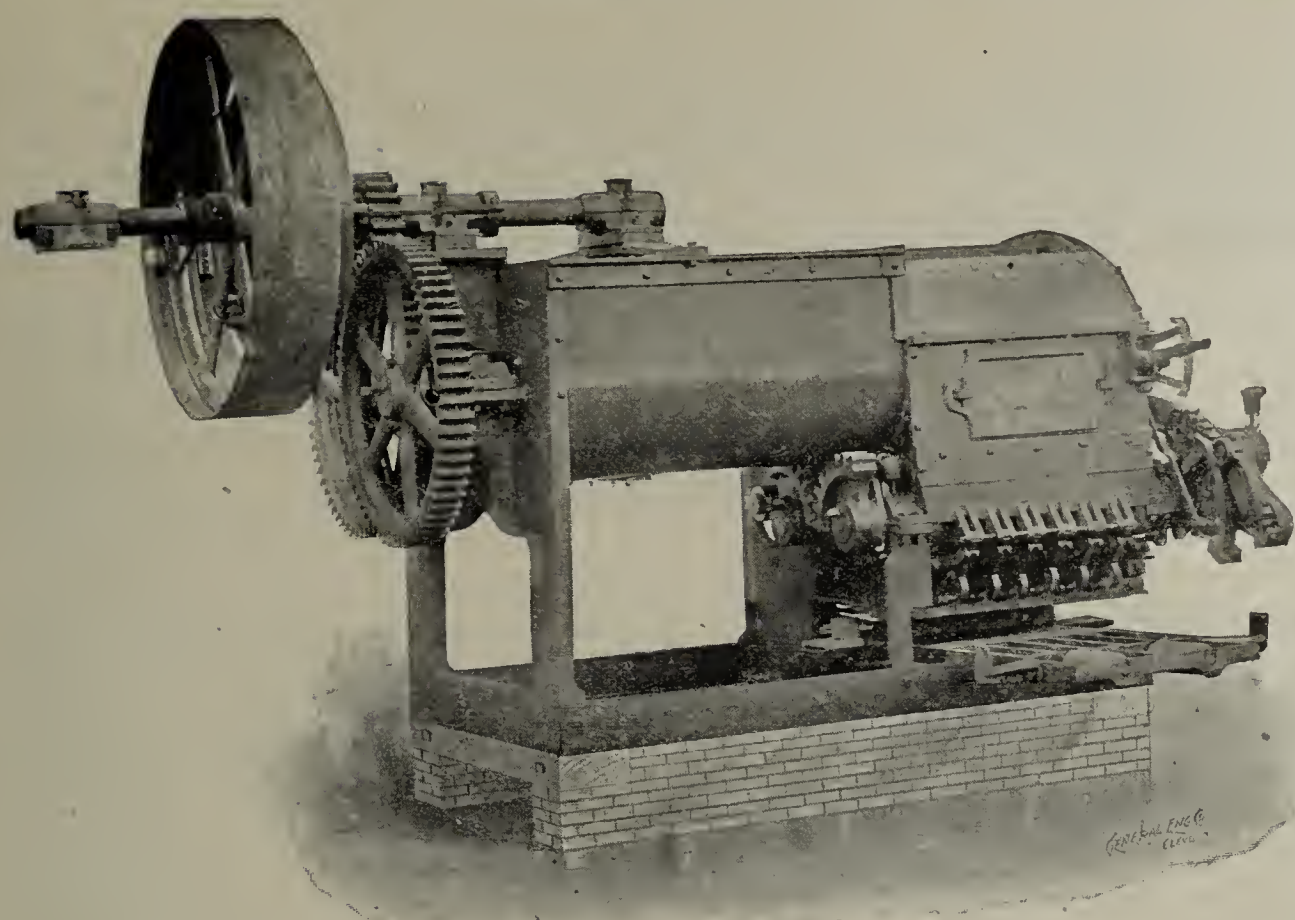
John F. Fulcher, an expert brick machinist, of Nashville, Tenn., who is engaged in putting up the machinery of the new Huntsville (Ala.) Brick Co., was the victim of a peculiar accident recently. Adjoining the boiler room is a well thirty feet deep, which is at present covered by a temporary door. Mr. Fulcher attempted to get a drink of water and knocked a prop from under the door. The heavy door fell against him and knocked him head foremost into the well, which had fifteen feet of water in it. Mr. Fulcher was severely stunned, but held himself above water until help arrived. He was badly bruised.

THE VAN DUZEN STEAM JET PUMPS.

These little giants will pump any kind of liquid except oil or grease. With them water can be forced fifty feet high and delivered 1,200 to 1,500 feet distant. Greater elevations and further distances require additional pumps. They can be worked in many places where no other steam pump can be placed. These pumps have no valves or moving parts to get out of order, are always reliable, durable, cheap, portable and useful in a thousand ways. They are made in ten sizes, ranging in prices from $7 to $75. Write the E. W. Van Duzen Co., Cincinnati, O., for catalogue number.

TOURISTS' TICKETS TO FLORIDA AND WINTER RESORTS IN THE SOUTH.

Ticket agents of the Pennsylvania lines will answer inquiries about low fares to Florida and winter resorts in the South. Full information concerning tourists' tickets, timetables, etc., will be furnished free. Persons contemplating a Southern trip may secure valuable information on the subject by merely inquiring of the nearest representative of the Pennsylvania lines or by addressing W. W. Richardson, district passenger agent, Indianapolis. Say when and where you wish to go, how many will be in the party, starting point, etc., and you will be promptly posted. The inquiry will not cost much effort—it will save considerable bother in arranging details, as they will be looked after gratis.



Over 75 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

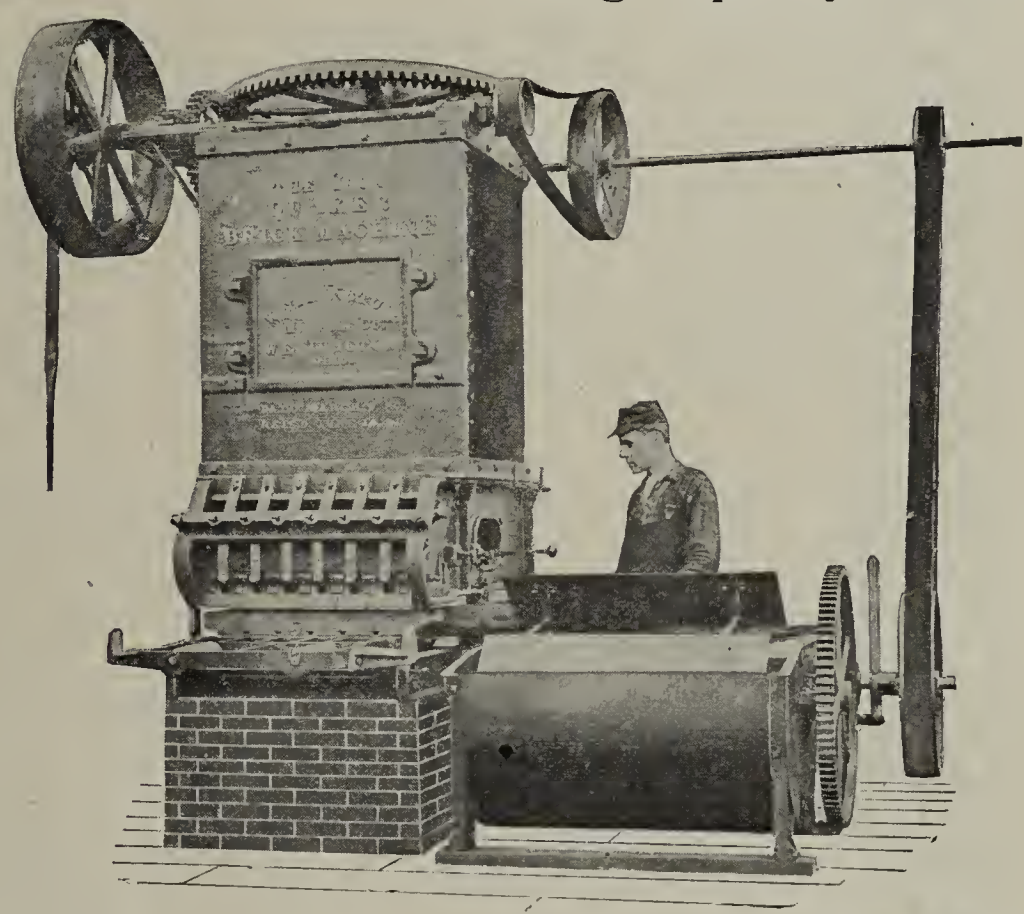
Long acknowledged the best for small and average sized yards.

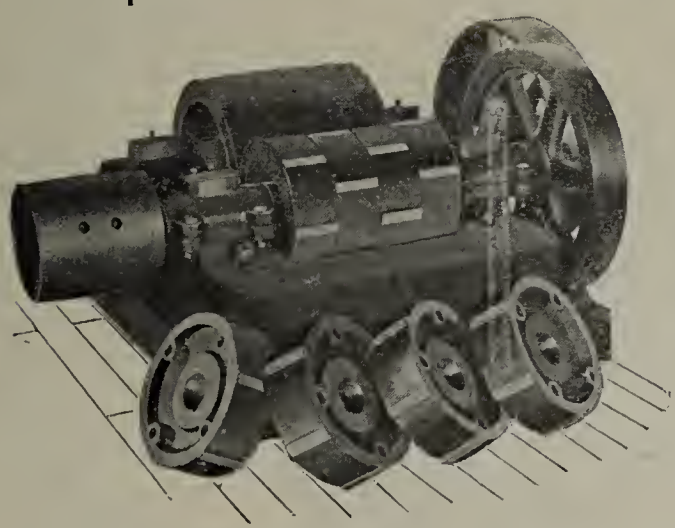
FOR 1900

We have added several new machines to our line.

Send for our 1900 Circulars.

Our mould-sander is the best, simplest and cheapest.

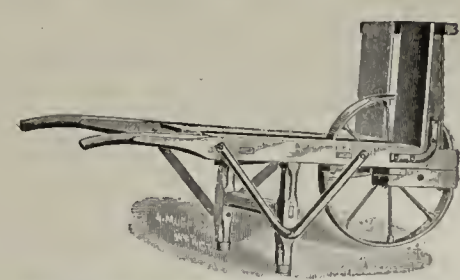


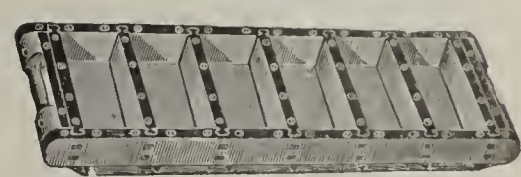


TWO Styles of Disintegrators, Solid rolls with inserted cutting bars and cutting roll made of hard sections.

MOULDS, TRUCKS, BARROWS,

and all other Supplies.

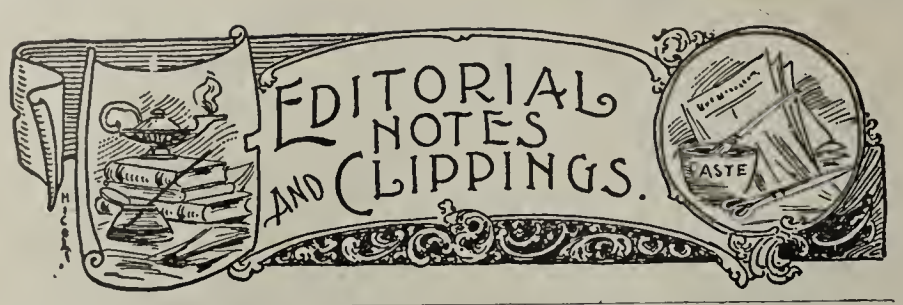




Nothing runs easier than our BALL-BEARING BARROWS AND TRUCKS.

The WELLINGTON MACHINE CO.,

WELLINGTON, OHIO.



Barr & Mitchell are establishing a brick plant at Leesville, Md.

J. S. Rolfe contemplates establishing a brick plant at Oak Ridge, Md.

J. C. Pass, Roxboro, N. C., is in the market for brickmaking machinery.

French & Co., of New Orleans, will start a brickyard at Harriman, Tenn.

Contractors at Bemidji, Minn., are complaining of a scarcity of brick.

The C. P. Merwin Brick Co., Berlin, Conn., has purchased the Yale Brick Co.

The Curwenville (Pa.) Fire Brick Co. has been chartered. Capital stock, $100,000.

The Park Fire Brick Works, near Beaver, Pa., were totally destroyed by fire recently.

J. A. Wilson, Paw Paw, Ill., will make extensive improvements at his brick and tile plant.

J. Y. Aderton, Bessemer, Ala., desires catalogues of clay grinding machinery for use in a pottery.

The Chanute (Kan.) Vitrified Brick and Clay Co. has been incorporated, with a capital stock of $30,000.

Abbot & Jones, of Kinston, N. C., have their new brick plant at Clark's Station, that State, almost ready to operate.

The Ohio Ceramic Engineering Co., Cleveland, O., report a very busy season, and say their orders are far ahead of those of last year.

Frank James, Mayor Harbit and Lewis Heffner purchased the Elwood (Ind.) Brick Works, which were sold recently at receiver's sale.

Ernest Renhold, proprietor of the brickyards at Sebewaing and Unionville, Mich., contemplates making extensive improvements in both plants.

Lewis Miner, an employe at the Warren (O.) Brick and Tile Co.'s works, was caught on a bank of falling clay recently and instantly killed.

C. C. Welborn, of Argentine, Kan., will establish a large brick plant at that place. He expects to have the plant in operation within sixty days.

W. S. and A. M. Page have purchased a tract of clay land from J. M. Eakes, Lebanon, Tenn., on which they will erect a brick plant at an early date.

G. W. Burlingame has purchased a brick plant at Oldfield, Va., and has equipped it with new machinery, and will turn out a fine grade of building brick.

The Hillsboro (Ill.) Brick and Tile Co. are making preparations for enlarging their plant, as they expect to turn out several million brick this coming season.

The Moorhead Brick Manufacturing Co., of Moorhead, Minn., is putting in a plant for the manufacture of brick. They expect to be in operation by the time spring opens.

J. W. Parker, of Meridian, Miss., will establish a steam brick works at Laurel, Miss. The plant will have a capacity of 30,000 daily, and will be in operation by the 1st of March.

The Iowa Brick Co., Des Moines, Ia., contemplate spending at least $10,000 in improving their works. J. M. Wood, general manager, says they will put in two or three new machines, and so improve and increase their capacity. He says the prospects were never better, and that they expect to increase their business 100 per cent.

A fire brick plant is wanted down in Georgia. Any one sufficiently interested can obtain information by addressing L. T. Lee, of Zenith, Ga., where it is said there is a fine deposit of clay.

In a recent letter W. H. U. Jenkins, C. E., of Portsmouth, O., says he has found The Clay-Worker far beyond his expectations in point of excellence, beauty and fund of useful information.

L. C. Chatham, of Montgomery, Pa., writes that he expects to start a brick plant at McElhattan, Pa., in the spring, where there is a fine deposit of clay suitable for the manufacture of stiff mud brick.

C. A. Smith, who has purchased the Knowles, Taylor & Anderson plant at East Liverpool, O., will make extensive changes and improvements in the plant in both the sewer pipe and brick departments.

The Verdigris Valley Vitrified Brick Co. has been organized at Neodesha, Kan., with a capital of $20,000. The plant will have a daily capacity of close to 100,000 brick, and work on the plant will begin at once.

Ashael Knapp, a pioneer of Dubuque, Ia., died at his home there Feb. 9. Mr. Knapp was the first to make brick in Dubuque, and had only recently retired from the business owing to his advanced age, eighty-three years.

S. G. Reynolds writes that there is a splendid opening at Billings, Mont., for a brick plant. He says building operations were very active there last season, and indications are for still greater activity the coming season.

The Arthur B. Nitsch Brick Co. has been incorporated at Baltimore, Md. Arthur B. Nitsch, Charles F. Nitsch, Roman C. Nitsch, John H. Dumler and Harry E. Karr. The capital stock is placed at $100,000, divided into 1,000 shares.

The Shirley Brick Co. is the name of a new firm that will start a new soft mud brick plant at Shirley, Ind. They are in the market for a complete outfit for making 25,000 brick a day. James Lawson will be manager of the new plant.

John W. Maxcy, of Houston, Tex., writes that he is at the head of an enterprise that will establish a large drain tile manufactory at that point, and is desirous of corresponding with parties having second-hand drain tile machinery for sale.

Clifton Hope, St. Michaels, Md., in renewing his subscription to The Clay-Worker, states that he would like to have some one send him a plan for putting an arch over a kiln, as none of the brick masons in his section seem to be able to build one for him.

L. M. Patterson, of Patton, Pa., has leased the terra cotta works at Lock Haven, Pa., and will put the same in shape for operation at once. He will manufacture sewer pipe of all sizes. The works will have a capacity of four or five carloads of pipe a day. The company will be known as L. M. Patterson & Co.

J. H. Barry, president and manager of the Atchison (Kan.) Paving Brick Co., writes that they have purchased the plant of the Drury Brick and Tile Co., and are moving the machinery, etc., over to their plant. This will enable them to double their present capacity. They are very busy making necessary changes.

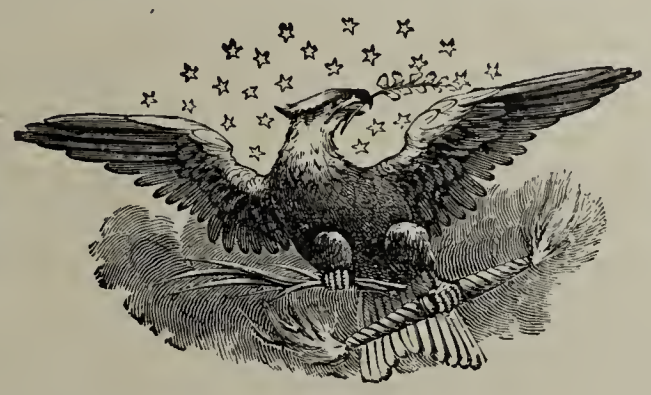
Horace Purinton will enlarge his brickyards at Waterville, Me., in order to meet the increasing demand for brick which he anticipates the coming season. The demand for brick in that section last year was larger than ever before, and the brick manufacturers have every reason to believe it will be still larger next season.

In a recent letter J. C. Steele & Son, Statesville, N. C., say: "We are glad to report that business for the new year is most

(CONTINUED ON PAGE 188.)

THE UNITED STATES OF AMERICA.

STATE OF OHIO,
CITY OF CLEVELAND.

$  No.

OFFICIAL BOND OFFER

Know all Clay Workers by these Presents, *That in order to demonstrate what our machines are and what they will do, we will place, freight prepaid, any one or more of them in your plant, and you will be under no obligations to purchase until our claims are fulfilled in every particular.*

OUR LINE INCLUDES:

- Double Mold Steam Represses
- Double Mold Hand Represses
- Single Mold Hand Represses
- Double Mold Dry Represses
- Single Mold Dry Represses
- Screw Represses
- Power Screens
- Automatic Feeders
- Pug Mills
- Auger Machines
- Combined Brick Machines
- Sword Brick Machines
- Automatic Cut-offs
- Semi Automatic and Hand Cut-offs

This offer is made on any of these machines.

In Testimony Whereof, *The Ohio Ceramic Engineering Co., has affixed its official signature and seal.*

THE OHIO CERAMIC ENGINEERING CO.
CLEVELAND, O.

EDITORIAL NOTES AND CLIPPINGS—Continued.

promising. The forests of the country are fast disappearing, and we think that the building material of the future is brick. We have booked orders for six large outfits within the past few days. Our repress is moving off lively. It is our opinion that the year 1900 will be a banner year for brick manufacturers."

The stockholders of the Wooster (O.) Shale Brick and Clay Co. held a meeting recently and elected a board of directors, who in turn elected the following officers: President, A. Branstetter; vice president, W. C. Yost; treasurer, J. R. Naftzger, and secretary, Charles Curry. They also voted to increase the wages of all employes April 1.

The tile works at Lisbon, O., which was sold to R. W. Allison several months ago, was sold Feb. 7 by Mr. Allison to the United States Clay Manufacturing Co. Mr. Allison acted as trustee, and when the plant was sold to him it was understood it would become the property of the United States Clay Manufacturing Co. The consideration was $230,000.

I. C. Wheeler, an old-time brick manufacturer, of Carthage, Mo., is going to make a number of changes and improvements in his plant, and will put in dry pressed machinery for the purpose of making press brick, in addition to common builders. Last year Mr. Wheeler turned out 1,700,000 brick, and he expects to increase this number the coming season.

John and Thomas Lynch and William Bennett, Sr., of Haverstraw, N. Y., have purchased a large tract of land on the Hudson river at Greenbush, a small town between Saugerties and Kingston, on which they will erect an immense brickyard the coming season. It is said the property contains enough clay to run a large brick plant for one hundred years.

Richard Knowlson, one of the oldest brick manufacturers engaged in the business at Pittsburg, Pa., died there Feb. 14. His father was one of the first brickmakers of Pittsburg, and Mr. Richard Knowlson took charge of the business when his father died. Mr. Knowlson was seventy-two years old, and had been a resident of Pittsburg for sixty years. The brick works which he operated had been located on Boyd's Hill for forty-five years.

The Diamond Fire Brick Co. has been incorporated at Canon City, Col., by E. I. Hiatt, James Horney and E. F. Jewett. The latter gentleman is president and superintendent. Mr. Jewett writes that they have over 200 acres of very superior fire and pottery clay, and will manufacture a general line of assayer's fire clay goods, crucibles and scorifiers, etc. Mr. Jewett says the only fault they have to find with The Clay-Worker is that it does not come often enough.

The National Fireproofing Co.'s factory "A.," at Pittsburg, Pa., was damaged to the extent of $75,000 by fire, which started in the engine room, the last day of January. The loss is fully covered by insurance. This factory is but one of five operated by this company, and, being the oldest, had never been remodeled. The others are all fireproof buildings. W. D. Henry, secretary of the company, states that they are behind with orders now, and the factory will be rebuilt as soon as possible, and this time the building will be all fireproof.

T. Franklin Frederick, a prominent resident and well-known brick manufacturer of Kingston, N. Y., was instantly killed by driving over a ten-foot embankment near Terry's brickyard some time in the evening of Jan. 22. There were no witnesses to the accident, but the necks of both Mr. Frederick and that of his horse were broken when found. It is supposed that death was instantaneous. Mr. Frederick was very fond of fine horses, and as the animal he was driving was a very spirited one, it is supposed it became unmanageable and dashed down the embankment, taking his master with him. A local paper, commenting on the accident of Mr. Frederick, says: "T. Franklin Frederick was born in Haverstraw, Rockland county, on Oct. 18, 1853, and has been a resident of East Kingston since 1885. He was a self-made man, and was justly proud of his success, which was due solely to his industry, perseverance and correct business methods. He was unmarried. He had many friends among all classes of people, and his sudden death is regretted by everyone who knew him."

Alfred Yates, manager of the Johnsonburg Vitrified Brick Co., Johnsonburg, Pa., writes that they are going to double their capacity from 6,000,000 to 12,000,000 pavers, and will begin the work of building kilns as soon as the weather will permit. They will build ten kilns and put in a Williams pulverizer. In closing his letter Mr. Yates says: "I enjoyed the Convention, and think we owe a debt of gratitude to the pioneers of the N. B. M. A. that we can never pay. I hope the members will not think I am a fighter because I spoke my honest convictions."

The Williams Patent Crusher and Pulverizer Co., of St. Louis, Mo., report an exceedingly bright outlook, as they now have on their books ten to fifteen orders for clay and shale mills alone. They say they have recently purchased heavily of raw material and installed a number of improved tools, and are therefore better prepared to supply hinged hammer crushers and pulverizers at short notice than ever before, and in addition can give the trade the advantage of their many years of experience. They sold last year 125 crushers and pulverizers, a large percentage of which were shale and clay machines.

At the Paris Exposition.

The Burt Manufacturing Company, of Akron, O., have just completed a shipment of the Cross oil filter, manufactured by them, for the Paris Exposition. These goods are finished especially for their own exhibit and for use in the power house of the United States machinery exhibit there.

The Burt Manufacturing Co., of Akron, O., manufacturers of the Cross oil filter, increased their business last year over 50 per cent., which they consider remarkable, as their record for 1898 was an increase over any previous year in the history of the company. One of the good things which came to the Burt Co. in 1899 was the adoption of the Cross oil filter by the British government. This was not an empty glory by any means, as large orders followed for various branches of the government service.

The Berg Not an Infringement.

The Anderson Foundry and Machine Works wish us to state that before taking up the manufacture of the Berg press they went carefully into the matter of patents, and were assured by the best patent authorities in the United States that the Berg press patents were valid in every respect, and that the Berg press was in no way an infringement on the Boyd or any other dry press.

The Anderson Foundry and Machine Works wish us to assure all readers of this journal that they will protect all purchasers of the Berg machine to the fullest extent, and are prepared to give bonds in any responsible surety company whenever desired to protect all customers against expense, loss or damage, by reason of any patent litigation arising from the use of the Berg press. Their answers have been filed with the clerk of the Federal Court, and an early hearing prayed for. THE ANDERSON FOUNDRY & MACHINE WORKS.

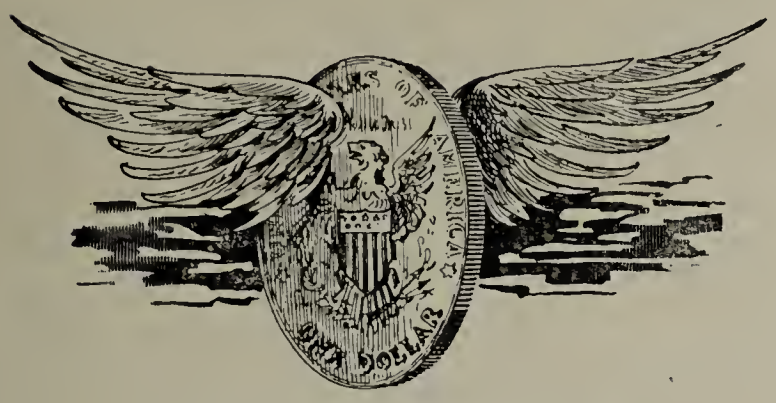
RARE OPPORTUNITY—An interest in well located and well equipped Brick Yard in Northern Michigan is offered on very desirable terms to a reliable manager with capital. Good market, inexhaustible material, cheap fuel and two railroads
GEO. KANE,
2-tf dm. Care Clay-Worker.

FOR SALE CHEAP—5,000 to 6,000 Mershon C Pallets with risers on ends; Two 6-Mould Brick Machine (Soft Mud); One Winding Drum; Two 1½ yard Bottom Dump Clay Cars. Machinery practically new.
Address,
H. MULBERGER, Executor.
3-3 em. Watertown, Wis.

FOR SALE—Two 4-Mold Boyd Press; 2 Clay Elevators; 2 Clay Screens; 8 Spring Trucks; Atlas Engine, Cylinders 14x20; Boiler 60-Horse Power; Two 6-inch Dry Pans. All in good condition, having been used very little.
Address,
C. P. MERWIN BRICK CO.,
21 d Berlin, Conn.

WANTED—Brick or Tile Machine, Pug-Mill, Belt-driven Drum or Hoist, Dump and Flat Cars, Rails. Send full particulars.
MIDDLESEX,
3-1 em. Care The Clay-Worker.

A Saving in Fuel



"A Dollas Saved is a Dollar Earned."

Means a much larger balance on the right side of the ledger at the close of the season. Where this saving is accompanied by an improved quality of ware, a smaller percent of soft brick and a shortening of the time required to burn, the advantages are multiplied. This is just what is accomplished by the **Grath System** of burning with slack. This is no idle boast but an actual fact as many brickmakers, who are using the **Grath System** will testify.

For instance, we refer to the Savage Fire Brick Co., Keystone Junction, Pa., who have a yearly capacity at their several plants of 18,000,000 brick. They have over forty kilns, all of which they will change to the **Grath System**, because they have demonstrated to their satisfaction that it is a money saver. They know now that there is a good profit on the actual saving of fuel bills compared with old methods of burning. We will be pleased to give the names of other manufacturers who have demonstrated the economy of the **Grath System**, and are now profiting by it.

We are saving them money, can do the same for you, whether you are going to build new kilns or alter old ones. Our furnaces can be used to advantage in connection with any permanent kiln, whether up-draft or down-draft. Full particulars furnished cheerfully.

See Ad on page 207. **The Illinois Supply & Construction Co.,** St. Louis, Mo.

The PROGRESS BRICK PRESS.

THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick. Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE ON APPLICATION.

ORNAMENTAL BRICK.

We carry a full line of shapes in red color, and will be pleased to forward our Brick Catalogue on application. Liberal discount to dealers.

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. *ST. LOUIS, MO.*

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — One good pressed brick setter and sorter, and one good sorter and brick handler. Address
1 2 dm L., Box 23, Lehigh, Ia.

WANTED — A party with about $8,000 to take a half interest in a soft-mud yard. Address O. V. PAYE,
12 4 c Station "C," Los Angeles, Cal.

FOR SALE —A good, well-equipped tile factory, in central Ohio. Worth the money. A bargain. Address
2 3 cm J., care Clay-Worker.

WANTED - Two seven-foot (second-hand) dry pans.
MONMOUTH POTTERY CO.,
2 3 d Monmouth, Ill.

WANTED — 100 Iron Brick Cars, for steam dryer. Address, with price and description ROANOKE BRICK COMPANY,
2 1 dm Lynchburg, Va.

A SUPERINTENDENT WANTED — Must be thoroughly competent to take full charge of paver plant, 20,000 capacity. Address
2 1 cm IA., care Clay-Worker.

WANTED — Situation as superintendent of either dry-pressed or plastic brick plant by a thoroughly practical brickmaker. No. 1 references given. Address CHICAGO,
2 1 dm Care Clay-Worker.

WANTED — Position as kiln setter. Can set terra cotta, building or ornamental brick. Handy man around kiln, up or down-draft. No. 1 reference. Address RAY,
2 1 cm Care Clay-Worker.

WANTED — Position as superintendent of paving or press brick plant, by a thorough, practical and experienced man. A No. 1 reference. "HUSTLER."
2 3 d Care Clay-Worker.

FOR SALE — One 36-inch Stedman Mill, latest make, almost new. Can give good reason for selling. Apply to
ERIE CHEMICAL WORKS, Erie, Pa.
2 3 d

FOR SALE — First-class Sewer Pipe Plant. Unlimited amount first-class clay and a good market for all ware made. Good reason for selling. Address J. W. & T.,
2 3 dm Care Clay-Worker.

WANTED — Position as manager or superintendent of Brick Plant, either common, fire, building or paving bricks. Thoroughly practical and experienced. Address "SUPERINTENDENT,"
2 1 cm Care Clay-Worker.

WANTED — Partner to furnish machinery for pressed brick plant. We will furnish clay bank and buildings. Fine shale, natural gas, oil or wood for fuel. Demand unlimited. CARROLL & COBB,
2 1 cm Corsicana, Tex.

FOR SALE — Anderson brick machine, '99 model. Complete, with horse power and steam attachments and about 50 molds. Machine has been used but 3 months. Will sell at a bargain.
ALBUQUERQUE BRICK CO.,
2 1 cm Albuquerque, N. M.

FOR SALE — One Raymond brick machine and cutting table, Raymond iron pug mill, both good as new; two Raymond power represses, two hand represses, wood pallets, two Penfield No. 2 power represses, two Frey-Sheckler clay cars, six spring brick trucks, one Monarch soft-mud brick machine and sander, one Webster heater, two Marsh pumps, 100 horse-power each, one 9-foot Means dry pan, one Freese board-delivering cutting table.
SUBURBAN BRICK CO.,
2 1 d Wheeling, W. Va.

A COMPLETE BRICK PLANT FOR SALE AT A BARGAIN

EVERYTHING NEW.

Only brick plant located in Warren, O., a town of ten thousand inhabitants. Having bought same at assignee's sale, must be disposed of at once.
THE HORTON MFG. COMPANY,
Painesville, O.

WANTED — Brick and tilemaker with some capital. Have the finest inexhaustible body of clay in Michigan. Near railroad. Good home market and no competition.
A. H. ABRAMS, Lawrence, Mich.
2 1 cm

FOR SALE — A steam power brick plant. Pallets and hacking shed. Located two miles from South Bend, Ind. Good gravel road, fine market, cheap rent. Reason for selling, poor health. Address
JOHN H. SHANK,
2 1 c Lock Box 107, South Bend, Ind.

FOR SALE — One good 16 horse-power engine and 20 horse-power tubular boiler. Also brick and tile machine (H. Brewer & Co. No. 6), with dies from 3 to 10 inches, inclusive. Will be sold at a bargain. Address THOMAS A. CLARKE,
2 1 cm Danvers, McLean Co., Ill.

FOR SALE — A large tract of land, comprehending what is unquestionably the finest vitrifying shale deposit in the country for paving brick, sewer pipe and stoneware. Labor, fuel, transportation the best.
R. L. LITTLE,
Room 414 Fullerton Building,
2 2 dm St. Louis, Mo.

POSITION WANTED — By experienced man as manager and superintendent of fire or common brick and tile plant. Would take entire charge of works. Fire brick, Loco furnace and other blocks, cupolas, slabs, etc., common brick and other clay products. Kilns of all kinds. Address
2 1 cm W. H. B., care Clay-Worker.

FOR SALE — Boiler and engine in No. 1 condition, as good as new. Cylinder engine 12x12; boiler about 40 horse power. All connections ready to set up in good shape. Also 40-foot smokestack, 20 inches in diameter, one Penfield plunger brick machine, one Freese board delivery cut-off table. For prices, etc., address
2 3 cm S. SHANNON, Shellsburg, Ia.

FOR SALE — Press Brick Plant, cost over $85,000, for $18,000—$6,000 down—50 acres clay 40 feet deep, 4 kilns and necessary machinery, good order. Located on canal and railroad in locality of city of 150,000 population and in close touch to 35 villages and cities from 5,000 to 150,000 population. Must be sold at once to close an estate. Address LOCK BOX No. 403,
2 1 cm Syracuse, N. Y.

FOR SALE — One Adrian No. 3 brick machine, new, one end-cut Leader automatic cutting table, four large iron pulleys, four-inch line shafting, doors and grates, two friction clay-hoisting machines, two Raymond side-dump clay cars, five end-dump clay cars, one clay conveyor, 120 feet long, one clay tempering machine, one clay plow. Everything used only short time. Sold very cheap. Address F. G.,
2 1 d Care Clay-Worker.

FOR SALE — Thirty-five acres of very valuable land, containing three distinct grades of clay, buff, shale and red brick clay. Also some coal. Located on railroad and accessible to water transportation. Cheap coal and labor. Have nine good down-draft kilns, 100 horse-power engine and three 40 horse-power boilers. Could be put into working order with very little cost for buildings. For further particulars address
2 1 d ATHEL D. JONES, Zanesville, O.

FOR SALE — A Sagger clay mine. Clay on eighty acres land. Mines opened up, reputation established. Mines on I. C. R. R., with side track running to clay shed. Clay extends to railroad right of way. Vein known to be from 35 to 50 feet in thickness. Reason for selling, haven't enough money to run business to an advantage. Most conveniently located mines in United States. Will sell all or take part in stock in company to operate same. Address
2 1 cm M. B. COOLEY, Mayfield, Ky.

FOR SALE — Splendid plant for manufacturing brick and porous terra cotta. Situated 15 miles east of Cleveland, O., between Lake Shore and Nickle Plate Railroads, having switches from both roads. Has 25 acres excellent clay bed, boilers, 150 horse-power engine, machines, presses, steam dryers, kilns and full equipment. Reason for selling, owner nonresident and in ill health. For further information call at 701 Cuyahoga Building, Cleveland, or write to
2 4 dm W. B. OWEN, Hobart, Ind.

FOR SALE — One 9-foot Frey-Sheckler Co. dry pan; one 40-foot cup elevator and gear; two 50-foot, 10-inch Harrison conveyor chains. Also, will sell complete equipment for a large stiff mud plant cheap. Inquire L. P. BATTEFELD,
2 1 d Bucyrus, O.

WANTED — The address of the clay-working machinery manufacturers who supplied the machinery for the Weinerberger, Liegelfabiks & Bangesellschaft, of Lathringerstrasse, Germany. They are requested to address VALENTINE,
2 1 d Care Clay-Worker.

LARGE BRICK YARD TO RENT.

The property known as the Mehrhof Brick Yards, at Little Ferry, Bergen county, N. J. having a capacity of over 25,000,000 yearly. This is a very desirable plant, with clay and sand in abundance, and local trade which has always taken over half of the brick made on this property at an advance over the New York market price. For further particulars inquire of
2 1 d D. A. PELL, Hackensack, N. J.

SECOND-HAND MACHINERY FOR SALE.

One four-mold Boyd press.
One 42-inch Stedman pulverizer.
One Fernholtz clay mixer.
One 20 horse-power Loco boiler.
One 20 horse-power Atlas engine, with two 40-inch band wheels.
40 feet of 12-inch stack, also connections for boiler and engine. Address
FERNHOLTZ BRICK MACHINERY CO.,
2 1 d St. Louis, Mo.

FOR SALE.

Tile and brick plant; 15 acres of ground; main shed, 170x24; two side sheds, 170x14; H. Brewer tile mill No. 9 and clay crusher; 3 20-foot down-draft kilns; large engine and boiler; Pratt steam trap and over 5,000 feet of drying pipe. Located in best agricultural section of Illinois, crossing of T., St. L. & K. C. and I. D. & W. R. R.; excellent shipping facilities; sidetrack into yard; demand for all can make; can make tile from 4 to 18 inches; cheap fuel; prices good; located in Edgar county, Illinois. Good reasons for selling. Address
2 1 dm M. J. LEE, Crawfordsville, Ind.

FOR SALE.

Sites for brick plants on fine tract of land, on James river, in Virginia. The land fronts the river 1½ miles, where vessels can lie within 30 feet of kiln. Banks are 50 feet high, 35 to 40 feet composed of this clay and the lower 10 or 15 feet contains excellent molding sand. Wood sells for $2 per cord. Newport News, Norfolk and Portsmouth, near by, are terminals for three extensive railroads, and, together, use 100,000,000 brick a year. The demand is increasing each year. An abattoir is being built, which will require millions and millions of brick. Will employ five to six thousand workmen, which means the extensive building of homes. Sites will be leased at low figures and long time. If you are interested it will pay you to investigate. Address W. L. J., care Clay-Worker.
2 2 cm

FOR SALE.

One Martin horse-power brick machine.
One Standard wood-frame steam power brick machine.
Two extra heavy Quaker machines.
One Fletcher and Thomas pug mill.
One Anderson brick machine, with 12-foot pug mill.
Three reliable hand brick machines.
One Potts mold sander.
One new Brewer crusher.
One second-hand Brewer crusher.
One Carnell repress.
Two Penfield roll crushers.
One Penfield No. 7 brick and tile machine.
One Penfield soft-mud machine.
One Penfield double plunger brick machine.
One Freese board delivery cut-off table.
One Fate-Gunsaules rotary table.
One 40 horse-power boiler and engine.
One Andress dry press machine, has two screens and two sets of special molds, for octagon, cornish and circle brick; good as new.
One Monarch brick machine, used two summers; in excellent repair.
HORTON MFG. CO.,
2 tf d Painesville, O.

FOR SALE — One of the best paying brick and tile factories in Iowa.
12 tf d **Lock Box 36, Lohrville, Ia.**

FOR SALE — One 2-mold Boyd press; good as new, with five shaped molds; cheap. Address L., Box 23, Lehigh, Ia.
1 2 dm

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
6 tf d Wellsburg, W. Va.

WANTED — For a large clayworking establishment, located near New York city, an experienced superintendent or manager, who thoroughly understands the manufacture of fireproofing as well as common brick; applicants please state past experience, amount of salary expected, references, etc. Address
H. F. JAMES,
11 tf d 156 Fifth Ave, New York.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address
OLD BRICKMAKER,
1 tf d Care Clay-Worker.

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

FOR SALE—A GOOD PROPERTY.

Brick and tileyards, consisting of 12 acres land, 7-room dwelling house, engine and machinery, with necessary sheds and buildings. Superior clay, easily worked, good territory, near large city, rapidly growing suburbs. Time allowed on part if wanted. Reasons for sale given. Correspondence solicited. Address, "E.,"
12 3 cm Care Clay-Worker.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

NOMINAL RENT — Small brick plant, center mining region northern New Jersey; near three competing railroads; unlimited sale. O. H. BABBITT,
1 3 cm Morristown, N. J.

FOR SALE — Brick and tile works, in good condition; large capacity; plenty of market; would consider other property for part pay; now in operation. Address
D. W. TOWNSEND,
9 6 d Cherokee, Ia.

FOR SALE — One four-mold Eureka dry pressed brick machine, but little used, at a great bargain; one No. 2 Worrell dryer; one 48-inch Ross disintegrator.
C. SIEDLER,
11 tf d 156 Fifth Ave., New York, N. Y.

ENAMELER of bricks and terra cotta will be open for an engagement on April 1; will give proof of ability to firms of undoubted standing; no others need apply.
ROCKAWAY,
1 2 c Care Clay-Worker.

FOR SALE — A Ross-Keller triple pressure, six-mold, dry-press brick machine, capacity 35,000 brick per day; good as new; used only 90 days, and it is in first-class condition. GEO. MATHERS,
12 3 dm 960 Nassau St., Cincinnati, O.

FOR SALE — CHEAP—One second-hand No. 1 Giant side-cut brick machine, built at Bucyrus, O.; in good order; used to make less than one kiln of brick. Address
CHAMBERS BROS. CO.,
Fifty-second and Media Sts., Philadelphia, Pa. 2 1 d

WANTED — Situation as superintendent or foreman of brick and tile works; 17 years' experience; thoroughly familiar with every detail of the business; no bad habits, and can give the best of references as to ability, industry, etc. Address
I. G. ERVIN,
310 N. Delaware St., Indianapolis, Ind.
1 2 cm

FOR SALE — 8,000 brick pallets, half-inch poplar, 33x10, three strips; in good condition; will sell cheap. Address
J. R. CRAVEN,
1 2 cm Walton, Boone Co., Ky.

FOR SALE — First-class tile works, equipped for making drain tile, brick and flower pots; four acres of good clay and shale. Address
GOODING & STOOKEY,
1 3 c Belleville, Ill.

FOR SALE CHEAP — One 4-mold Simpson dry press; used one year; cost $4,000; will sell for $1,100 f. o. b. cars Washington, D. C.; also two 100 H. P. Westinghouse engines $400 a piece. Inquire of
TOM COLLINS,
Phoenix Building, Washington, D. C.
1 3 d

FOR SALE — A large lot of good second-hand St. Louis fire brick and 12-inch floor fire brick, but little used and in first-class condition.
SIOUX PAVING BRICK CO.,
12 3 d Sioux City, Ia.

FOR SALE—New Brick and Tile Works. Built by citizens because must have the brick and tile. Extra good location, junction railroad.
2 1-d J. P. FARMER,
Sioux Rapids, Iowa.

FOR SALE CHEAP—One large size Iron Pug Mill, has been used very little, good as new, made by E. M. Freese & Co., of Galion, Ohio. One Crusher in good running order, made by H. Brewer & Co., of Tecumseh, Mich.
Address
WARREN BRICK & TILE WORKS,
1 3 c Warren, Mich.

FOR SALE—200 acres coal land, six foot vein two mines open and operating, equipped with half mile switch to main track, surface under cultivation, situated in Eastern Illinois. This land has also a strata of fine clay suitable for paving brick manufacture; some of the finest paving brick in the country having been made from it. Will sell coal and clay interests together or separately. For particulars apply to DR. JOSEPH FAIRHALL,
1 3 c m Danville, Ill.

FOR SALE — At Stotesbury, Mo., a brick plant, consisting of a horizontal Anderson brick machine, 25 horse-power Atlas stationary engine, 30 horse-power boiler, on skids, belting, trucks, 20,000 drying pallets, etc. Everything as good as new and in first-class condition. Ready to be set in working order without repairs. Address
2 1 dm M. E. J., care Clay-Worker.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.

PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.

SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH,
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 1 2 cm

LARGE PLANT FOR SALE,

A large brick plant, making soft mud and dry press brick, situated in a growing city of 45,000, within one mile of courthouse. The plant is equipped with the latest and best machinery, including Simpson dry press machine, Potts all-iron machine, sander and disintegrator, 12-track Standard dry kiln, latest improvements, 204 steel rack cars, etc., 75 H. P. engine, 2 steel boilers, 75 H. P. each, installed within a year, Eudaly down-draft and Wingard up-draft kilns, 42 acres of land; everything in first-class running order. Large established business of over 18 years' standing. Orders already booked for early spring trade. Owners desire to retire on account of old age and other business interests. Will be sold at a big bargain. Address A. K. A.,
1 1 dm Care Clay-Worker.

FOR SALE.

One Frost 9-foot dry pan.
One Frey-Sheckler pug mill No. 2, open top.
One Frey-Sheckler side-cut board delivery.
One Eureka vibrating screen.
One Potts 24-inch double roll disintegrator.
One Raymond single die power perfection repress.
One extension off-carrying belt, 12 feet long.
Reason for sale, changed plant from dry to wet process. Address
DIAMOND VITRIFIED BRICK CO.,
1 2 dm Portland, Ore.

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.

For **uniformity** in **burning, hardness of ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump**, and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

FOR SALE CHEAP.

Complete brickyard, in the centennial city of Ohio, with 12 acres land; good clay bank, 9 and 12 feet deep. Complete outfit, consisting of 2 good brick machines, one Penfield and other a Monarch; 2 engines, 100-horse-power boiler; a dryer, with large Buffalo fan, the attachments for same. and all necessary equipments for a first-class brickyard. Paved street and 2 railroads to the yard. Price for brick, $6 to $7 per M. Reasons for selling, poor health. Address, JOSEPH GATES,
12 3 cm Toledo, O.

FOR SALE.

No. 1 Michigan brick and tile machine, with upright pug mill.
Pulleys, tile dies 2½ to 12, hollow block dies, and side and end cut brick dies.
"Little Giant" re-press.
Kiln grates and bands.
30 h. p. tubular boiler with stack and grates.
No. 2 "Adrian" brick and tile machine, with tables, tile dies 2½ to 8, and side and end cut brick dies.
No. 2 crusher and elevator.
Canton Duplex boiler feed pump.
1 tf d J. F. CLARK, Morenci, Mich.

FOR SALE CHEAP.

Two 4-Mold Simpson Dry Presses, Cost $3,500 each. Only used three months. Plant having been changed to Paving Brick. Just as good as new. Will sell for $1,500 each F. O. B. cars, Cleveand, Ohio. Inquire of

FRANK B. MANY,
809 Cuyahoga Bldg. Cleveland, Ohio.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. Carbonate of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

....WHAT THE CLAY WORKER NEEDS....

Is a belt that will accomplish the heavy work required of it,

holding the bucket firmly without slipping.--This the

Leviathan Belting

does better than any other, and, what is of more interest to Clay Workers, the LEVIATHAN will

WORK FOR YEARS IN A DUST CLOUD,

or exposed to weather conditions of any kind.

THESE ARE THE REASONS WHY LEVIATHAN BELTING IS IN SUCH GENERAL USE AMONG CLAY WORKERS.

MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.

1221-41 Market St., CHICAGO. Send for Price List and Samples. 120 Pearl St., BOSTON.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

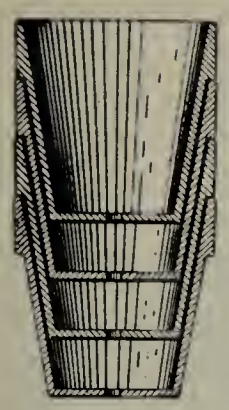
S. G. PHILLIPS, Agent and Patentee, 161 Grand Street, Rahway, N. J.

Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,
Detroit, Mich., U. S. A.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

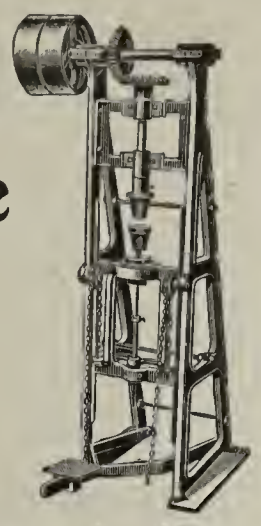
Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St., INDIANAPOLIS, IND.



Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., Western Ave. 17th-18th St. CHICAGO, ILL.

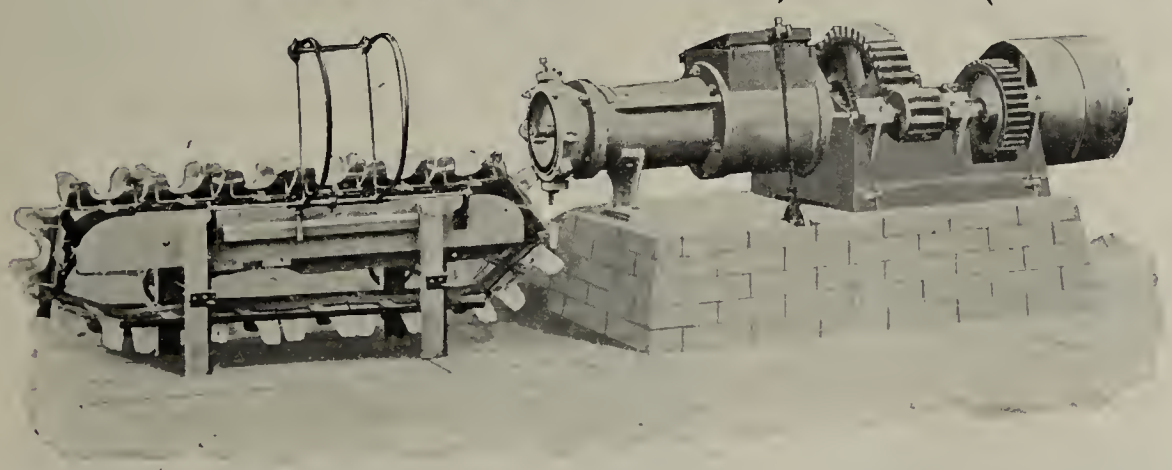
Our new Catalogue No. 25 (380 pages), will be sent upon application.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers ... of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

VanDuzen's STEAM JET Pumps.

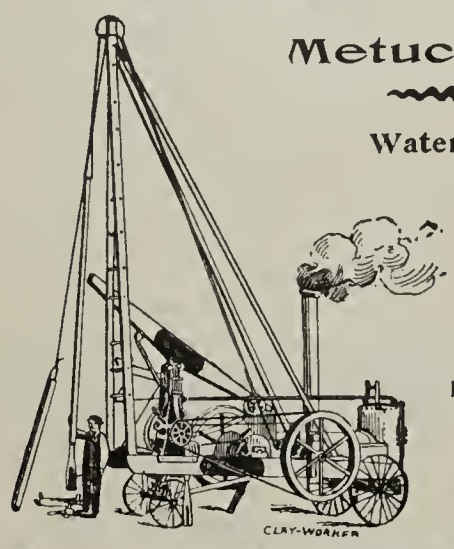
Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** etc., for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

W. R. Osborne,

Metuchen, N. J.

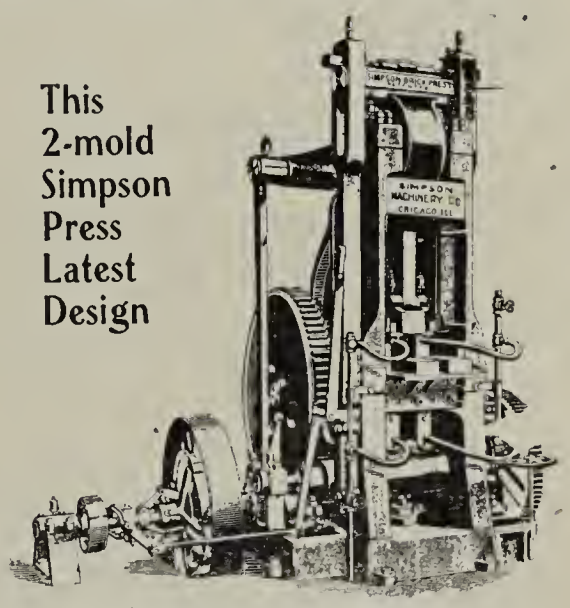
Water Wells, Tanks, Pumps, Etc.



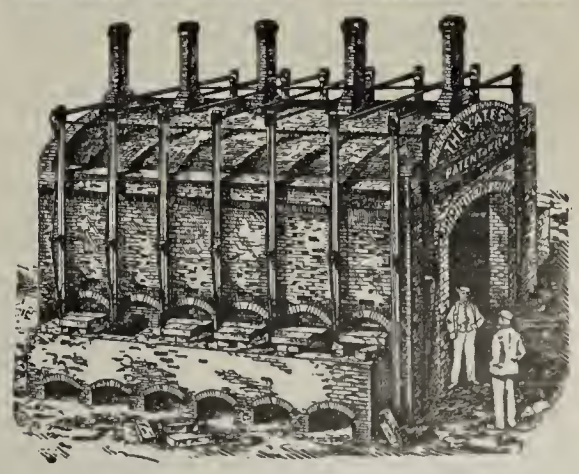
LOW PRICES

For Sale at a Bargain

This 2-mold Simpson Press Latest Design



WESTERN MACHINERY & SUPPLY CO.
163 La Salle Street, Chicago.



Economy of Fuel and Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.

Hot air dryer. Continuous and Muffle Kiln.

ALFRED YATES,
JOHNSONBURG, PENN

Davis's Brick, Tiles and Terra Cotta. Third Edition. Revised, Improved and Enlarged.

A Practical Treatise on the Manufacture of

Brick, Tiles and Terra-Cotta:

Including Stiff Clay, Dry Clay, Hand-made, Pressed or Front, and Roadway Paving Brick, Enameled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra Cotta, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics, and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace. With a Detailed Description of the different clays employed, the most Modern Machinery, Tools and Kilns used, and the processes for Handling, Disintegrating, Tempering and Molding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition. Revised and in great part rewritten. Illustrated by 261 engravings. 662 pages, 8vo. Price, **$5.00**

☞ *This volume will be sent by mail to any address in the world, or delivered by express C. O. D., freight paid, to any address in the United States for* **$5.00**

☞ *A circular of eight pages with specimens of the illustrations, showing the full Table of Contents, will be sent free to any one furnishing his address.*

☞ *Our New and Revised Catalogue of Practical and Scientific Books, 92 pages, 8vo, a New Catalogue of Books on Steam, the Steam Engine, etc., and our other Catalogues and Circulars, the whole covering every branch of Science applied to the Arts, sent free and free of postage to any one in any part of the world who will furnish us with his address.*

HENRY CAREY BAIRD & CO.,
Industrial Publishers, Booksellers and Importers,
810 Walnut St. PHILADELPHIA, PA., U. S. A.

ANGLO-AMERICAN POTTERY,

Old English China with American Views.

A Manual for Collectors, by
Dr. Edwin AtLee Barber, A. M., Ph. D.
Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

The price is $1 60 per copy, postage prepaid.

T. A. Randall & Co.,
The Clay-Worker,
INDIANAPOLIS, IND.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } **Chenoa, Ill.**

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

W. B. MERSHON & CO.,
Saginaw. East Side Mich.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc..

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

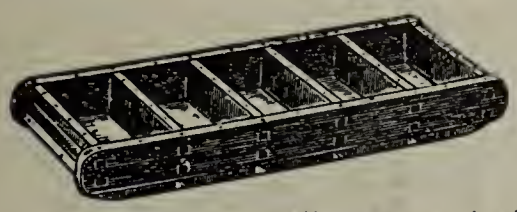
Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

G. COLDEWE & CO.,



MANUFACTURERS OF ALL KINDS AND SHAPES OF

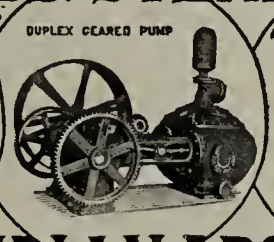
HAND and.... MACHINE **MOULDS**

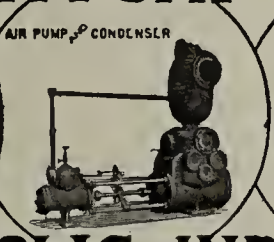
We manufacture the the most substantial Moulds known and guarantee every Mould to be first-class in material and workmanship.

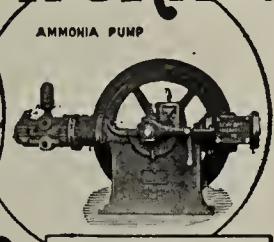
A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis

DEAN BROS' STEAM PUMP WORKS.







PUMPING MACHINERY FOR ALL PURPOSES

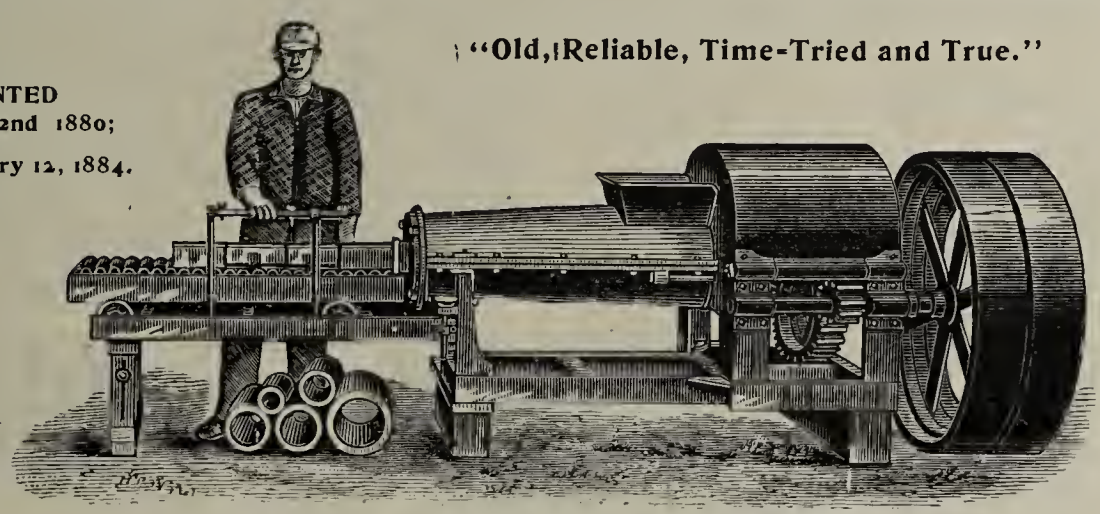
INDIANAPOLIS, IND.

SEND FOR CATALOGUE AND PRICES

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY,
Industrial Agt., St. Louis, Mo.

or

E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western RAILWAY.

Short line between **INDIANAPOLIS** and **KANSAS CITY.** The **only line running Reclining Chair and Sleeping Cars** between **CINCINNATI, INDIANAPOLIS, DECATUR** and **SPRINGFIELD, ILL.**

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	3.35 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

Solid Train Between

Sandusky and Peoria

—AND—

INDIANAPOLIS and MICHIGAN CITY,

FT. WAYNE and CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger	7:00 a. m.
*No. 22 Passenger	1:20 p. m.
No. 24 Passenger	7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger	10:20 a. m.
No. 23 Passenger	2:50 p. m.
No. 25 Passenger	6:20 p. m.

*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent, Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.,
INDIANAPOLIS, IND.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of

WESTBROOK & WELLS, Ogdensburg, N. Y.

The Philadelphia Commercial Museum,

DR. WILLIAM P. WILSON, DIRECTOR,

Supplies DETAILED, SPECIFIC INFORMATION concerning the TRADE CONDITIONS of the WORLD'S MARKETS.

It tells WHERE THE MARKETS ARE and by whom supplied.
Who the RESPONSIBLE BUYERS ARE, and HOW TO REACH THEM.

It can ascertain FOR YOU the particular REQUIREMENTS of any or all markets in THE LINE OF GOODS YOU MAKE.

It has inaugurated a most valuable method of REGISTERING AMERICAN MANUFACTURERS in Foreign Countries by means of

Card Index Files

Placed in the CHAMBERS OF COMMERCE in FORTY-FIVE of the PRINCIPAL COMMERCIAL CENTERS OF THE WORLD.

This is a movement in the Interest of American Commerce with which YOU SHOULD BE IDENTIFIED.

Write for particulars to

The Philadelphia Commercial Museum,

233 South Fourth Street, Philadelphia, Pa.

WEST and SOUTH

run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

South Dakota	Kentucky
Minnesota	Tennessee
Iowa	Arkansas
Wisconsin	Mississippi

Illinois, Indiana, Louisiana,

Presenting an unequaled territory for diversified industries, and possessing

Fine Sites for New Mills, Best of Freight Facilities--Coal Fields--Close Proximity to Distributing Centers. Intelligent Help of all Kinds. Many Kinds of Raw Material.

To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered Textile Industries in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.

FIRE BRICK

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

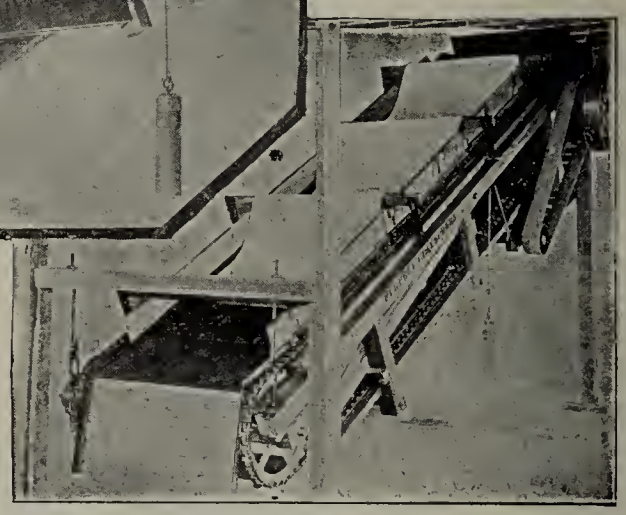
GEO. S. COX, East Liverpool, Ohio.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush

HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

The Peerless System Up-Draft, Down-Draft and Continuous Kilns

Is the Acme of Perfection in Brick Burning.

READ WHAT THEY SAY ABOUT IT:

LaPrairie Pressed Brick and Terra Cotta Co., Quebec:
"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, demonstrates our Entire Satisfaction with your PEERLESS SYSTEM.

Elmsdale Brick Co., N. S.:
"Never saw a Kiln work so even and free both in watersmoking and burning in all my life. The arches were as good as any other part of the Kiln."

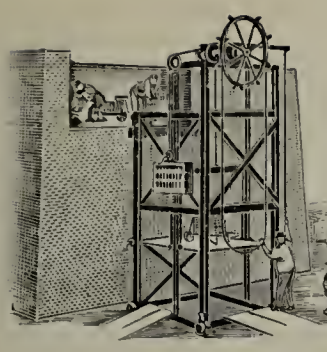
John Cubbins Sons, Memphis, Tenn.:
"After burning the first kiln that was changed, the second time, we found the improvement so great and so much Superior to the old updraft kilns, that we are now changing our entire system to your PEERLESS PATENT."

Jacob Kline, Baltimore, Md.:
"Your system of burning good hard brick is without doubt the best I have ever seen."

And there are Others.

No matter what you manufacture, or the capacity of your plant, if your make is of clay and you want it burned, write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. **Montezuma, Ind.**



What a buyer in 1890 says to-day of
The EUREKA BRICK ELEVATOR

Office of the Buffalo Brick Association,
A. C. Newton, Patentee, Cresent, N. Y.

DEAR SIR—Replying to your inquiry of the 8th inst., this Association is still successfully using the two brick elevators bought of you in 1890. They are useful and practical machines, and the long and hard use of them by us shows that they are constructed in a very serviceable manner.

Very truly yours,
The Buffalo Brick Asso.
O. W. WAGER, Mgr.

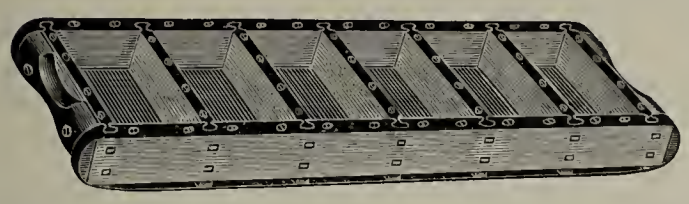
Write for particulars.

A. C. NEWTON, Manufacturer, Crescent, N. Y.

HARDIN & GRAY,

MANUFACTURERS OF

BRICK MOULDS



Of every kind and description. We make a specialty of Brick Moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.

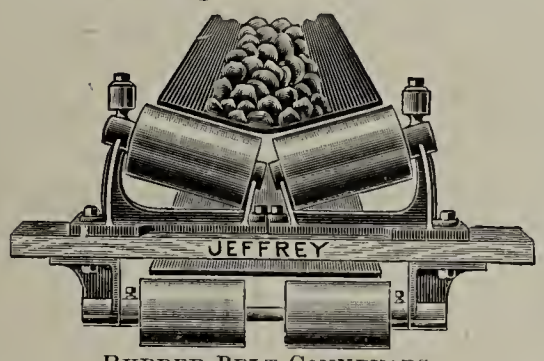
Don't fail to get our prices. (Telephone 1084.) **1510 W. Washington St., Indianapolis.**

The JEFFREY MANUFACTURING CO., Columbus, Ohio.

Elevating, Conveying and Power-Transmission Machinery,

For Handling Material of all Kinds.

Spiral Conveyors,
Clay Elevators,
Cable Conveyors,
Elevator Buckets,
Elevator Bolts,
Rubber Belting,
Cotton Belting,
Leather Belting,
Etc., etc.



RUBBER BELT CONVEYORS.

Jeffrey Detachable Chain,
Chains, (all styles).
Sprocket Wheels,
Shafting,
Pulleys,
Hangers,
Gearing,
Elevator Boots,
Etc., etc.

Special attention given to the designing of machinery for Handling Clay, Green Tile, Brick, Sewer Pipe and packages of every description. We can in many instances effect a saving of from 10 to 50% over present methods used.

SEND FOR CATALOGUE AND PRICES.

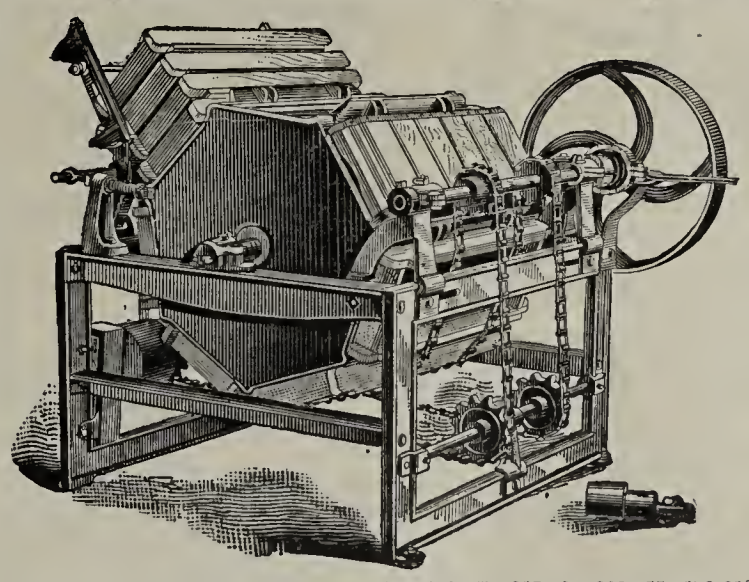
CHAMPION Brick Mould

SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been successful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent. CINCINNATI, OHIO
H. W. FULLER, Gen'l Pass. Agent, WASHINGTON, D. C.

The VANDALIA LINE

The Short Line for St Louis and the West.

	Leave Indianapolis.	Arrive at Terre Haute.	Arrive St. Louis
No. 15	7:25 am,	9:55 am	5:00 pm
No. 5	7:15 am	9:10 am	1:45 pm
No. 21	12:35 pm	2:37 pm	7:12 pm
No. 11	7:05 pm	9:05 pm	1:44 am
No. 7	11:20 pm	1:25 am	7:00 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No, 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.

All trains carry first-class coaches.

12:40 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent,
E. A. FORD, G. P. A. Indianapolis, Ind.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 2:30 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 11:55 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY.

Lv Indianapolis, 3:40 am, 7:45 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

Present capacity ten million. We are now prepared to furnish fine vitrified paving and extra hard foundation brick in any quantity. Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING.

SYRACUSE, N. Y.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO.,
Publishers,
INDIANAPOLIS, IND., U. S. A.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
TELEGRAPH OFFICE,
WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

J. L. HIGLEY & CO.,

CANTON, OHIO.

Four of the largest and best paving brick plants in the world.

Canton Paving Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.
Write for prices.

T. B. McAVOY, PRESIDENT. FRANK B. McAVOY, SEC. AND TREAS.

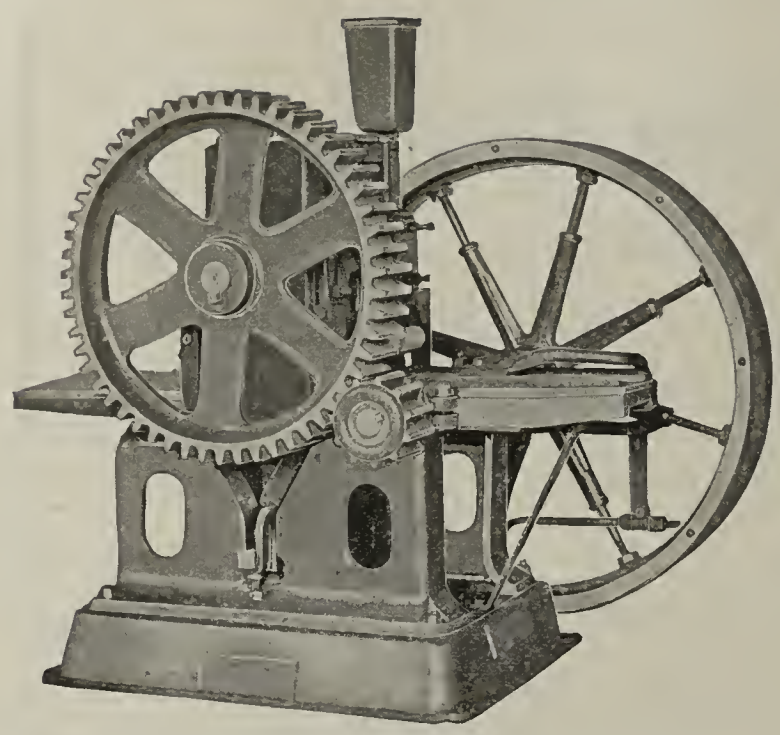
McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.



The Steele Repress,

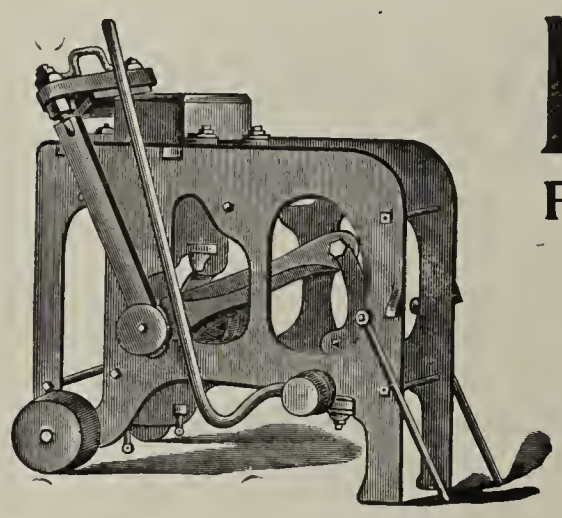
Price $185.00.

This is a very compact, strong and easily operated Press designed for the large number of yards which have more or less local demand for repressed brick which they are now filling with Hand Presses.

The compactness of this machine makes it almost impossible to break it, at the same time reducing the cost to very little more than hand press. A number of them have been in operation the past season giving perfect satisfaction.

> Fletchers, N. C., Oct. 27, 1899.
> Messrs. J. C. STEELE & SONS, Statesville, N. C.
> Relative to the Repress we are making 12 M brick per day and it works first rate with a standard paving die.
> Yours truly,
> ASHEVILLE BRICK & TILE CO.

J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**



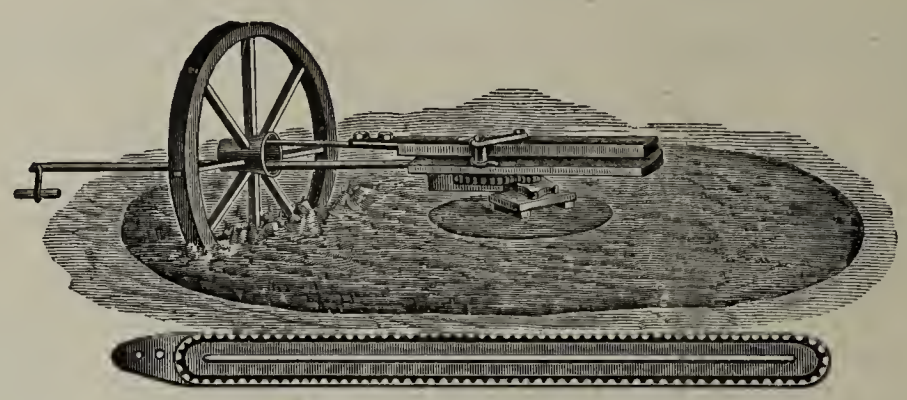
RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.

☞ Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

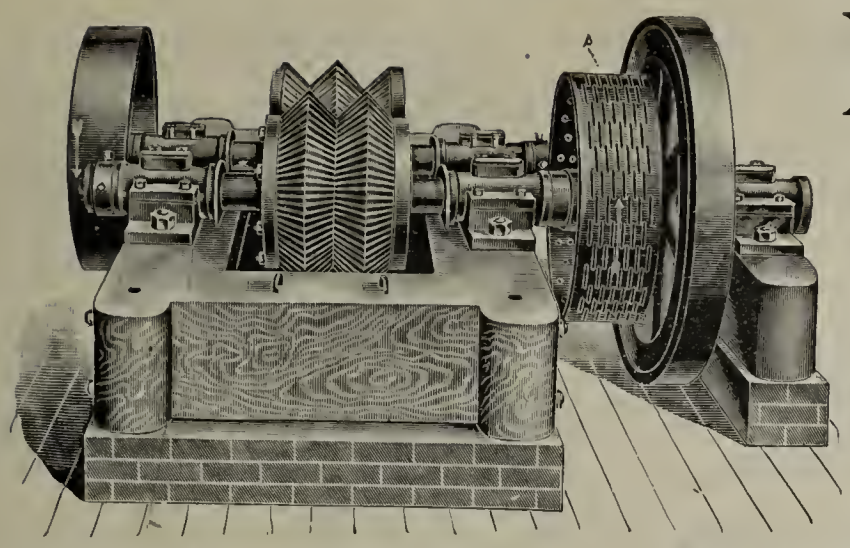
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



NEWELL CRUSHER.

Successfully crushes any and all kinds of Clays, preparing same for Brick, Tile or Terra Cotta. Fully guaranteed. Fast shaft fitted with Para Pneumatic Pulleys, increasing power of the belt, and efficiency of the crusher.

Also we equip these machines with Improved Elastic Roller Bearings when when desired. These bearings greatly reduce friction thereby saving power in operating, and insuring an always cool journal.

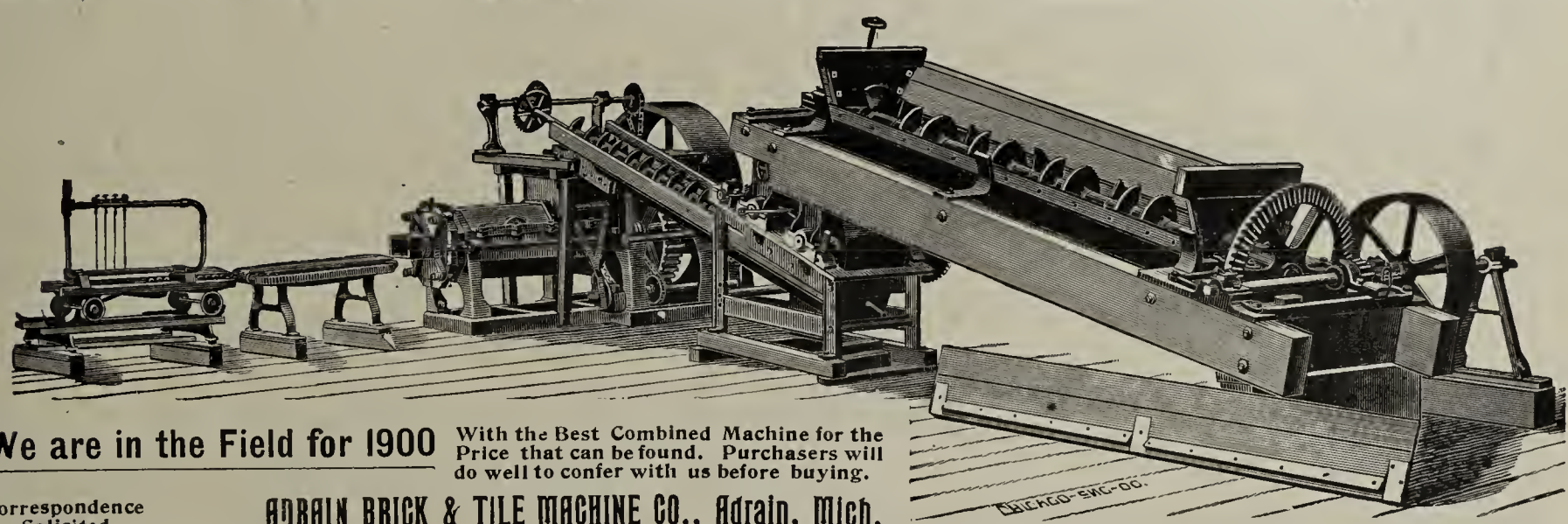
Our Crushers will do the work where others fail. Prices reduced Quality maintained.

Extract from a recent letter from the Frontier Brick Works, Niagara Falls, N. Y., "THE CRUSHER RUNS FINELY, AND IS ENTIRELY SATISFACTORY."

Write us for price and particulars, stating capacity wanted.

DUPLEX HEATING & MACHINE CO. L'td.

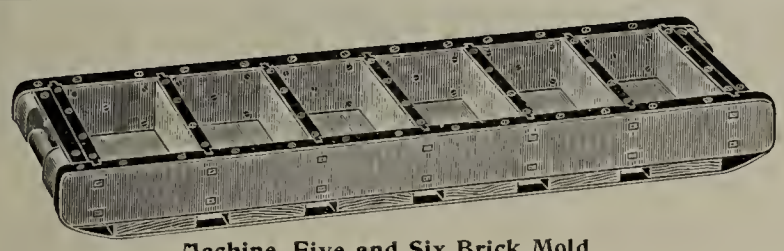
Successsors to Newell Universal Mill Co.
534 West 22d. St., NEW YORK.



We are in the Field for 1900 With the Best Combined Machine for the Price that can be found. Purchasers will do well to confer with us before buying.

Correspondence Solicited.

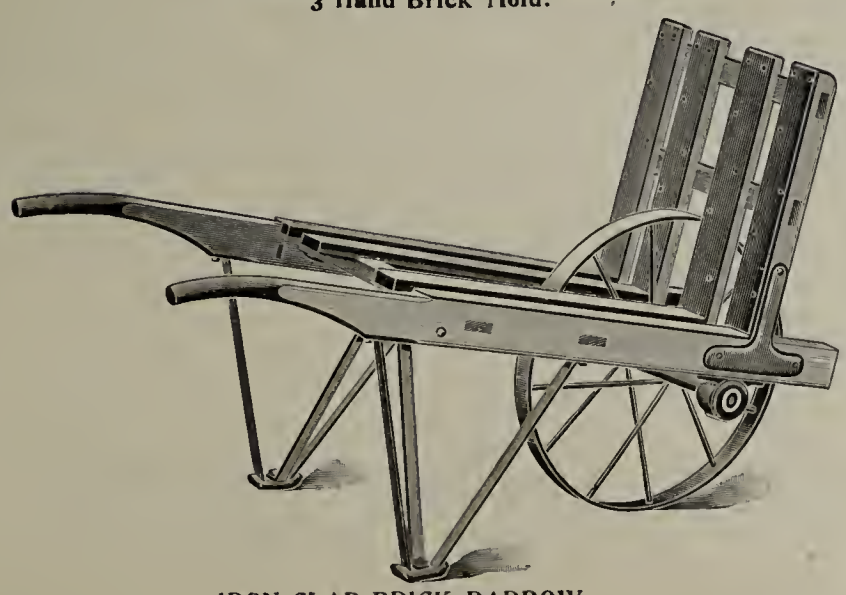
ADRAIN BRICK & TILE MACHINE CO., Adrain, Mich.



Machine, Five and Six Brick Mold.

6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

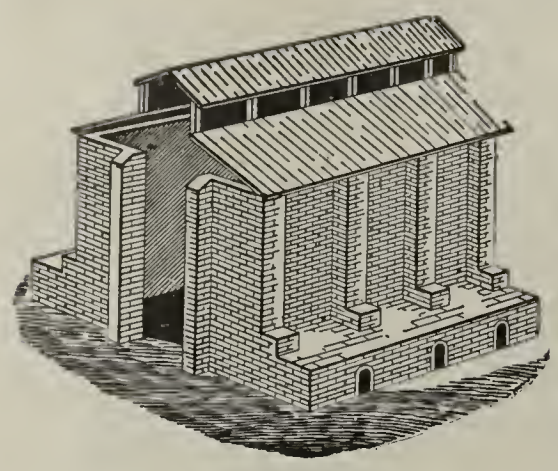
BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

D. J. C. ARNOLD,

New London, O.

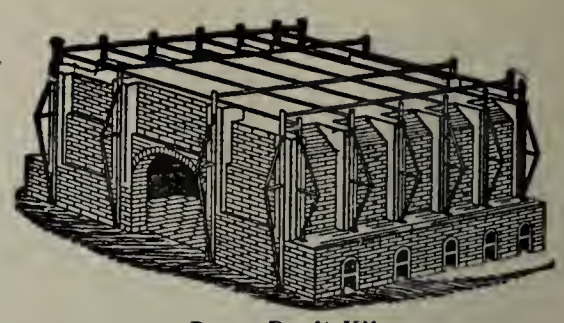


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, 2,422 Chestnut St., *Kansas City, Mo.*

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

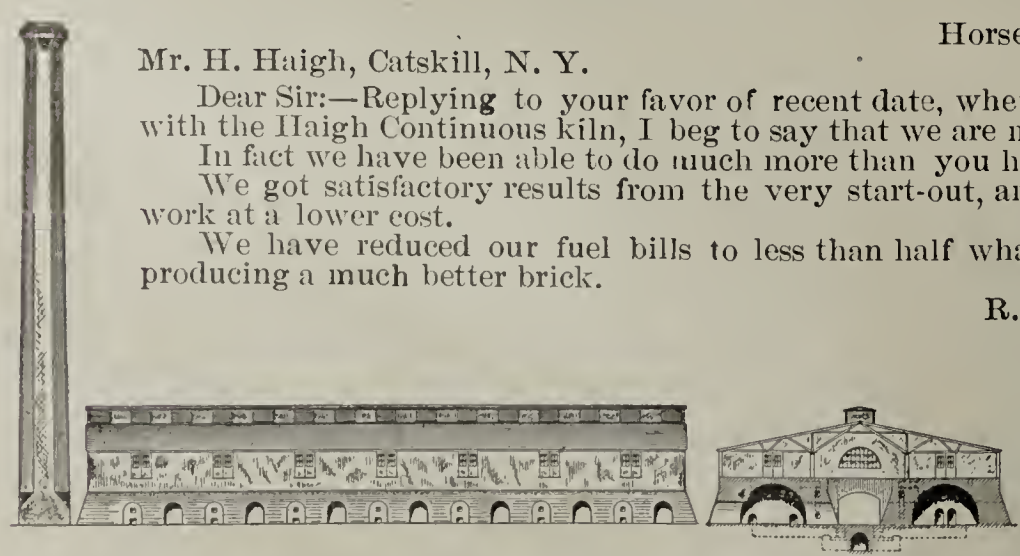
R. B. MORRISON & CO.,

P. O. Box 335. *ROME, GA., U. S. A.*

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile, Paving Brick and Common Building Brick.



Horseheads Brick Co., N. Y., August 13, 1899.

Mr. H. Haigh, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success.

In fact we have been able to do much more than you had guaranteed the kiln would do.

We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

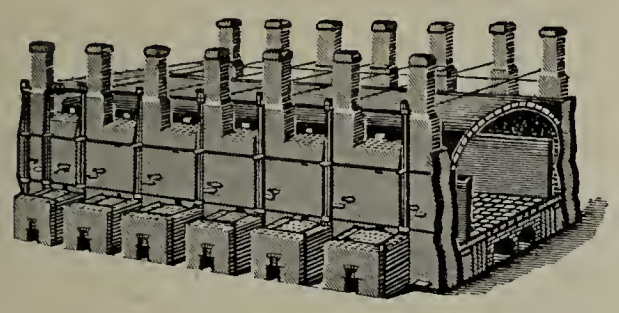
We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours,
R. G. EISENHART, Treas. and Gen. Man.

This kiln has now been in operation nearly three years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at $2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.

Address **H. HAIGH, Catskill, N. Y.**

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Oaks, Pa., January 26, 1900.
M. M. BUSHONG, Phoenixville, Pa.

Dear Sir:—Your letter of inquiry of the 25th inst, in regard to kiln received; in reply will say it gives us great pleasure to say that your kiln is doing splendid work, we have made eleven (11) burns and they were all a great success, in fact it surpassed our expectations in every particular, both to quality of paving brick produced and the amount of coal consumed and we contribute its success to the perfect system of drafts and absolute control of same. In other words if your kiln does not burn evenly from top to bottom or wall to wall it is the fault of the man in charge and not the kiln.

We have had a wide experience in the kiln line and do not hesitate to say that your kiln is the best for burning Shale Paving Brick to be found.

We can assure you that in the future should we build more kilns they will be the **Bushong Down Draft.** Wishing you success we remain,

Yours respectfully,
PERKIOMEN BRICK CO.,
Per HAGGINBOTHAM, Supt.

BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.

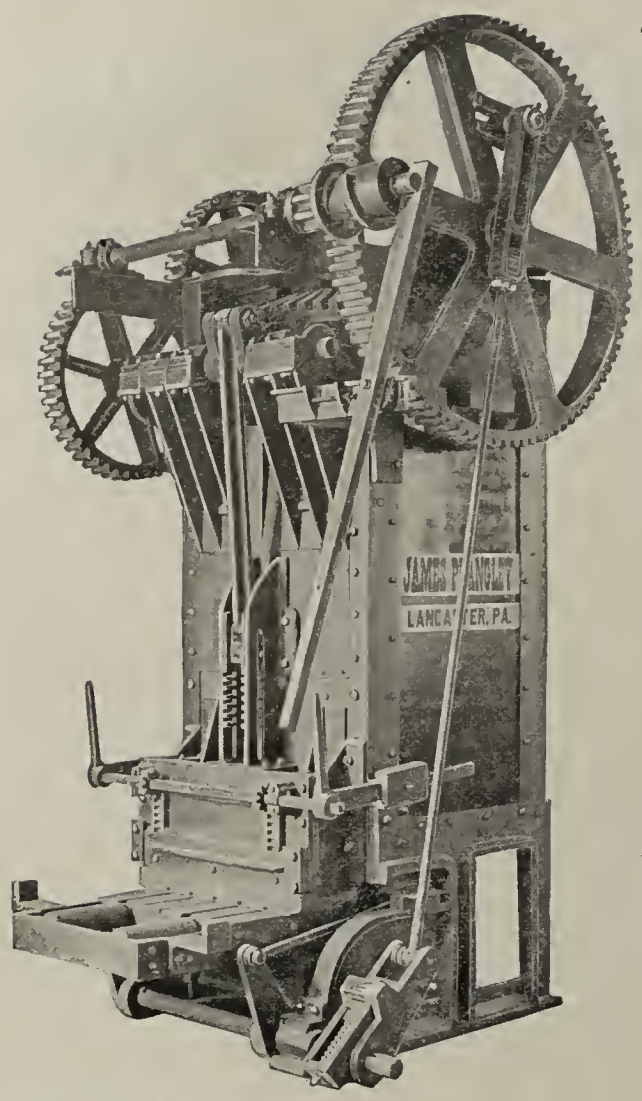
These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



The Prangley Brick Machine.

BUILT TO LAST A LIFE TIME.

Large Capacity. Molds Brick Very Stiff. Pug-Mill Not a Necessity, Will Work Clay Direct From Bank.

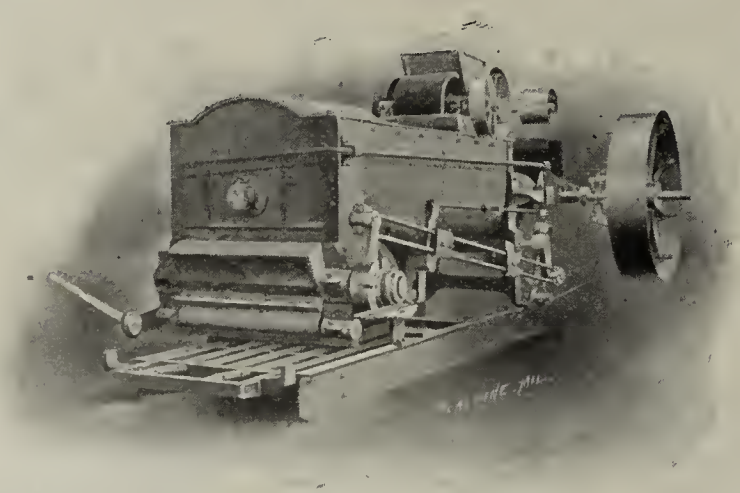
This Machine is constructed on practical lines by Mr. James Prangley, a successful brickmaker of thirty years experience. The tempering knives are of solid steel, and the press box is lined with steel, making it the most durable machine on the market. Brickmakers who buy the Prangley Machine will get their money's worth. Manufactured by

JAMES PRANGLEY,

Office 666 West Chestnut St.,

LANCASTER, PA.

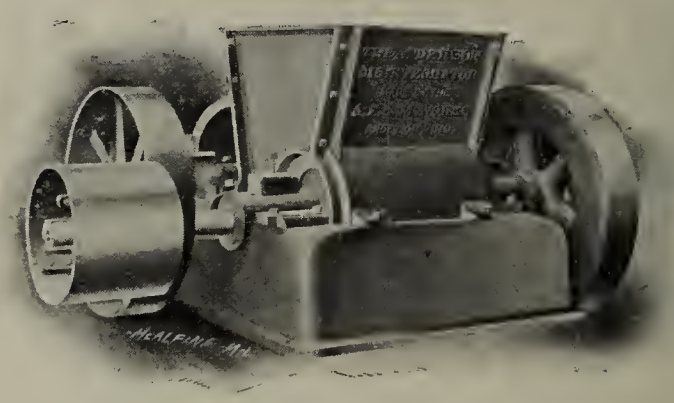
Write for Prices, etc., to
EDWARD C. HUHN,
Sole Selling Agent, 1215 Filbert St., Philadelphia.



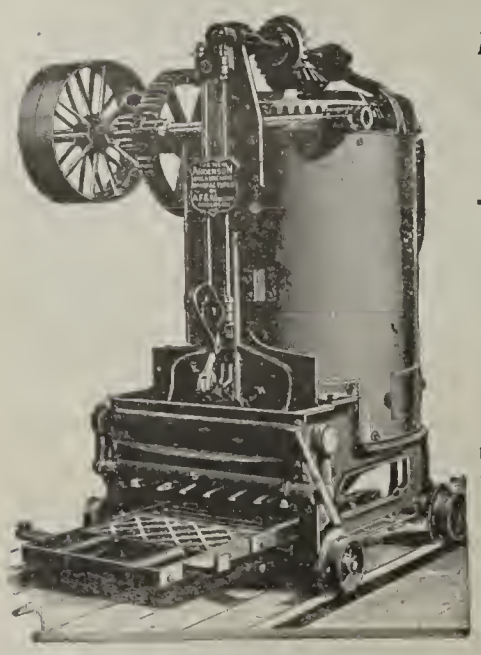
Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



Best Disintegrator on the Market.



Steel and Iron Upright Stock Brick Machine.

MANUFACTURERS OF . . . .

New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.

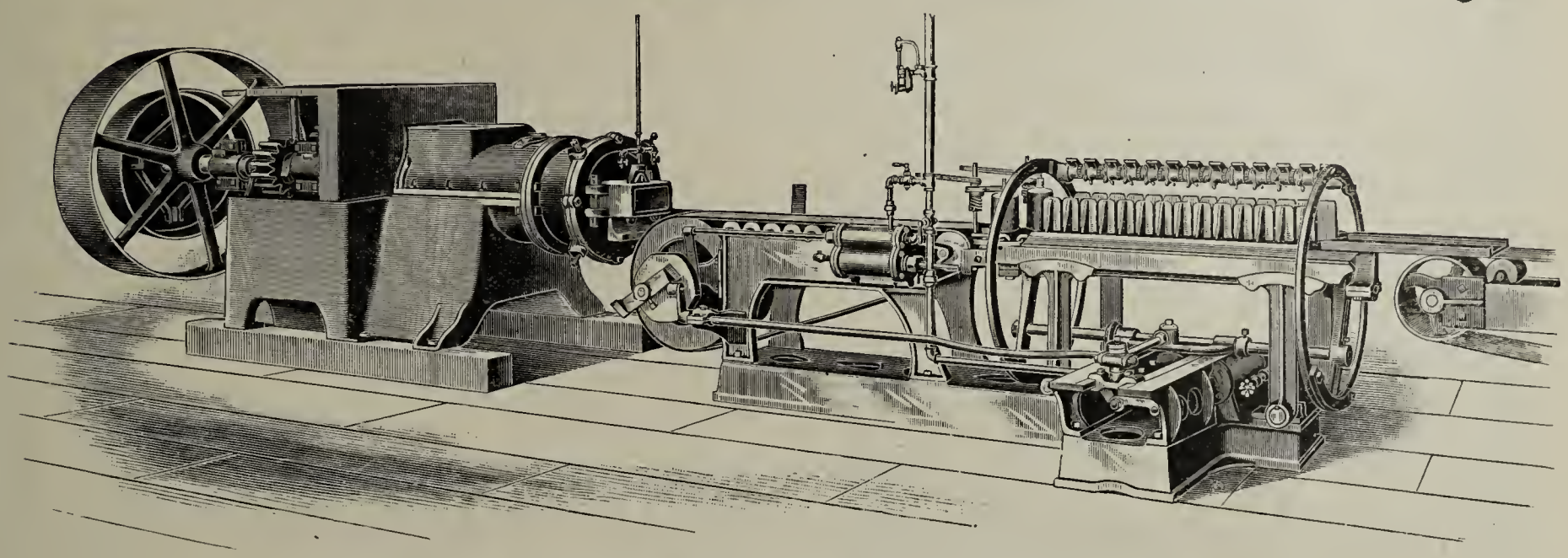
1899 Horse Power Machine.

The Anderson Foundry and Machine Works,
Anderson, Ind.

You Obtain More for Your Money

(When Purchasing)
(While Using)

Leader Machinery

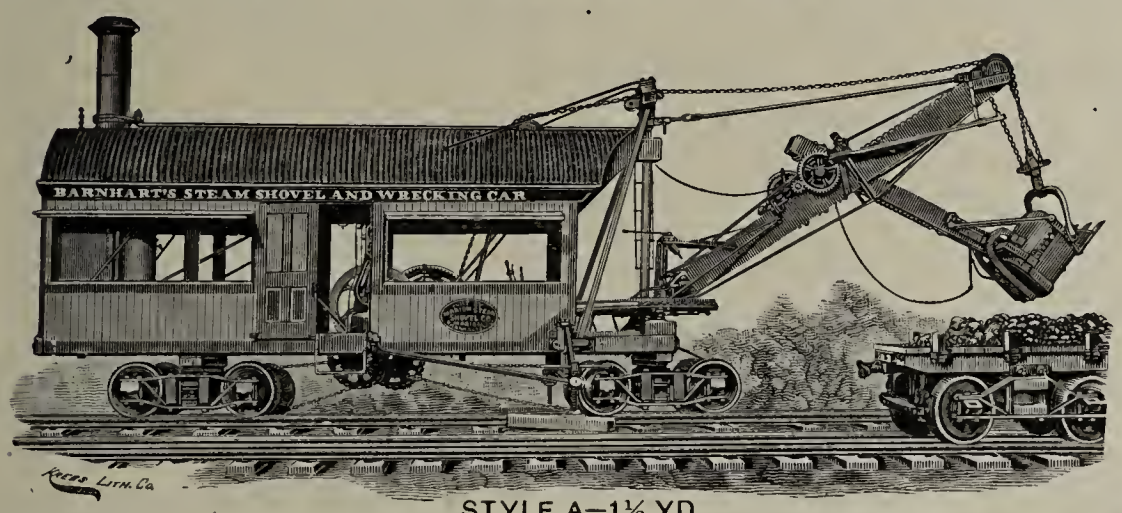


Leader No. 25 with Side Cut Die and Automatic Cutter.

LEADER MACHINES are most economical because they are properly designed and well built. They do good work with least waste. Printed matter illustrating and describing **Leader Brick Machines, Pug Mills, Crushers, Presses,** etc., free.

LEADER MANUFACTURING CO., Decatur, Ill.

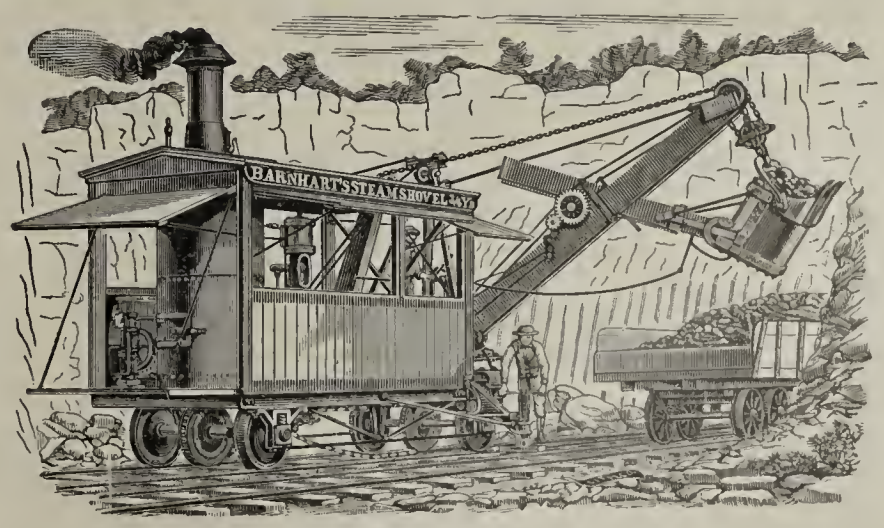
Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.



STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

"He that tooteth not his own horn
The same his horn shall not be tooted."

Therefore We Toot!!

OUR

Buckeye Kiln Brick

DRYER,

Is Drying AT ONE QUARTER the cost of

Steam Dryers.

No Gas, No Smoke,
No Repairs.

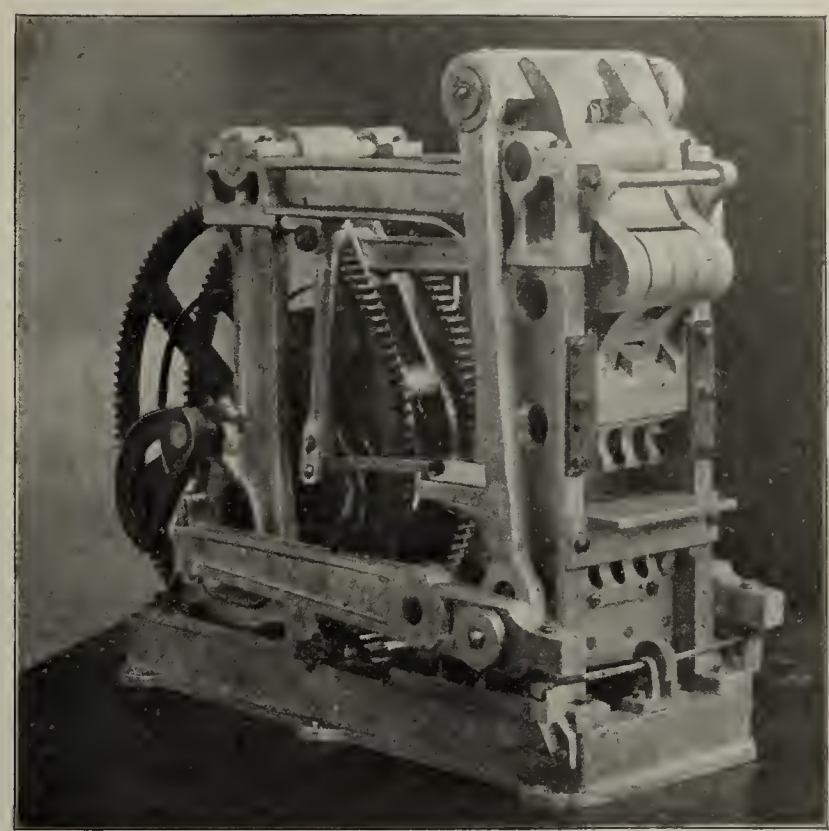
We Guarantee Results.

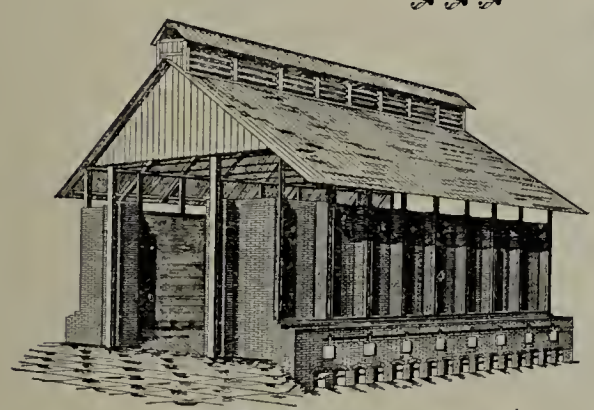
CLEVELAND CAR COMPANY,
CLEVELAND, OHIO.

The GRATH Brick Press.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

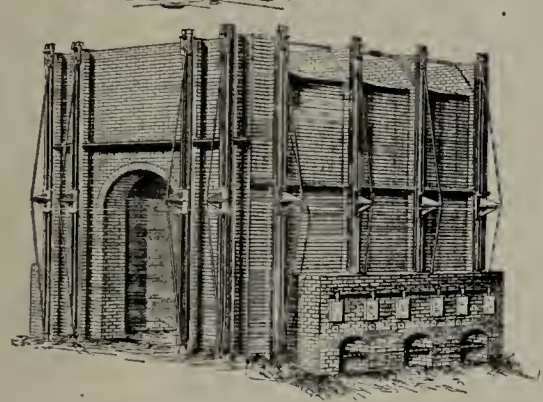
1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Operated with less Horse-power than any other Press.
5th. It makes Brick free from Granulation or Seams.
6th. It fs Adjustable.
7th. All Beamings Bushed.
8th. Master Wheels. Close to Bearings.
9th One Minute Required to Change thickness of Brick.
10th All parts easily Accessible





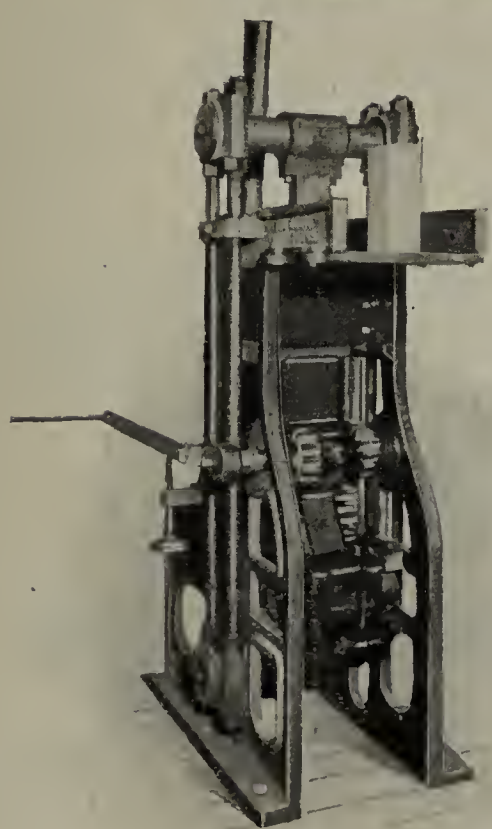
The Grath Up-Draft Kiln

WITH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with nothing but cheap slack, and with better results than by using lump coal in ordinary Furnaces.



The GRATH Solid Floor Down-Draft Kiln

With Slack Coal, Gas and Coking Furnaces Attached. This Kiln will give PERFECT Results and Burns nothing but Slack Coal for Fine Face Brick, Fire-Brick, Sewer Pipe, Pottery, Tile, Etc. ALL ware burnt uniform WITHOUT Injuring Flues under tight or Solid Floor.



The Grath Dry or Semi-Dry Clay Hand-Power Press

For PLAIN OR ORNAMENTAL PRESS BRICK AND TILE.

The only Successful Press of its kind in the Market

GUARANTEED TO GIVE SATISFACTION.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

The Grath Brick Grinding Machine

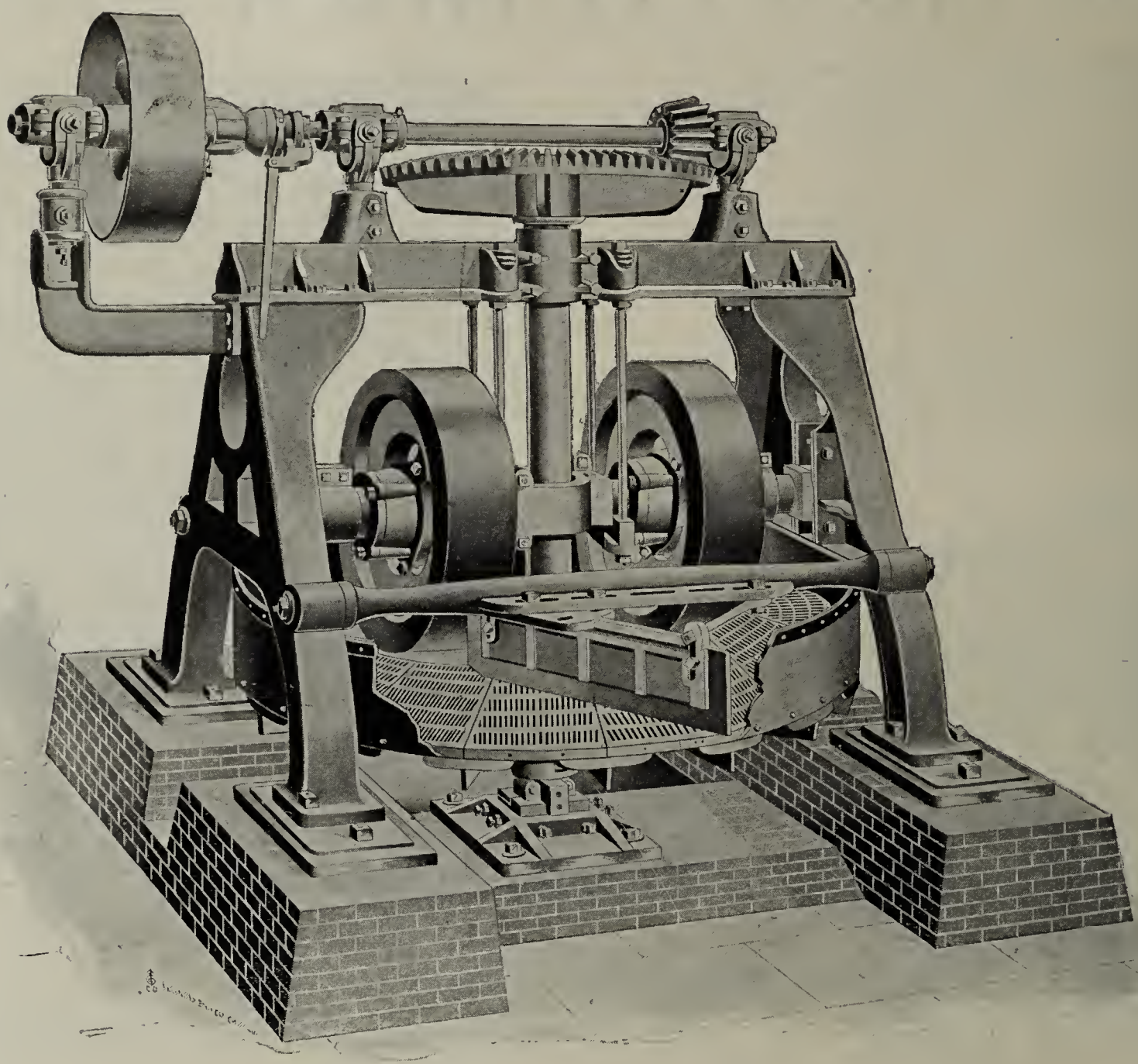
For GRINDING ARCH AND AND RADIUS BRICK OF ANY HARDNESS, EVEN TO A VITRIFIED BRICK.

Simplest, Best and Cheapest Grinding Machine in the Market. Used by the American Hydraulic Press Brick Company.

FOR FURTHER INFORMATION ON ABOVE, ADDRESS

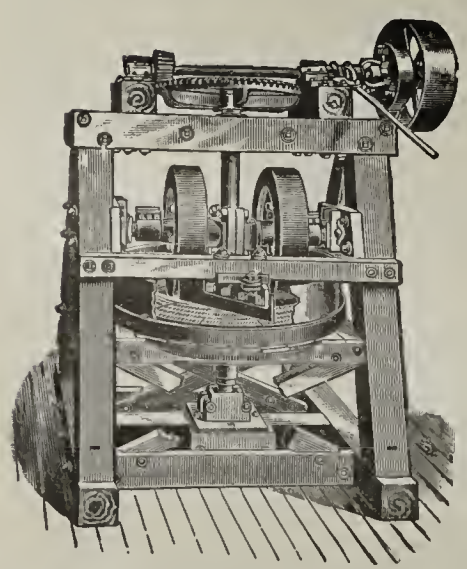
The Illinois Supply & Construction Co., St. Louis, Mo.

Mention the CLAY-WORKER.



OUR SPECIALTY IS

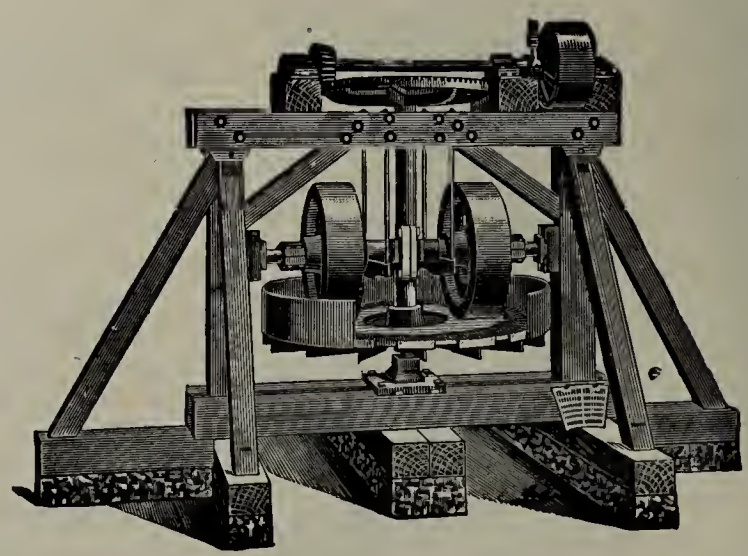
DRY PANS.



IRON FRAMES,

WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

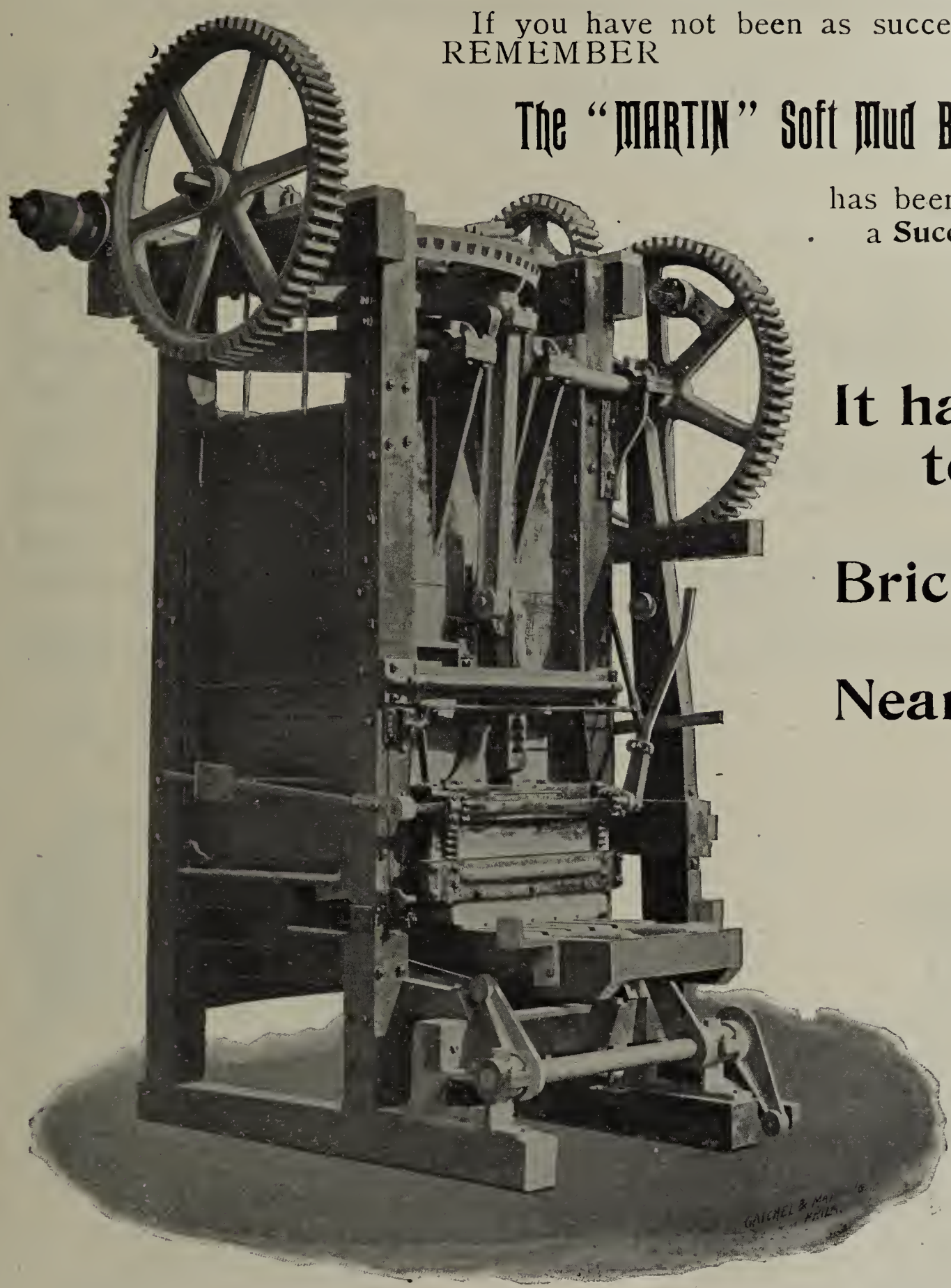
FROST ENGINE CO., Galesburg, Ill., U. S. A.

Start the New Year Right.

If you have not been as successful as many others REMEMBER

The "MARTIN" Soft Mud Brick Machinery

has been the making of many a **Successful Brickmaker.**



It has stood the test of Brickyard life for Nearly half a Century.

Up-to-Date Equipments are OUR Specialty.

We Furnish Everything a Brickmaker Needs.

Our new Catalogue contains much useful information.

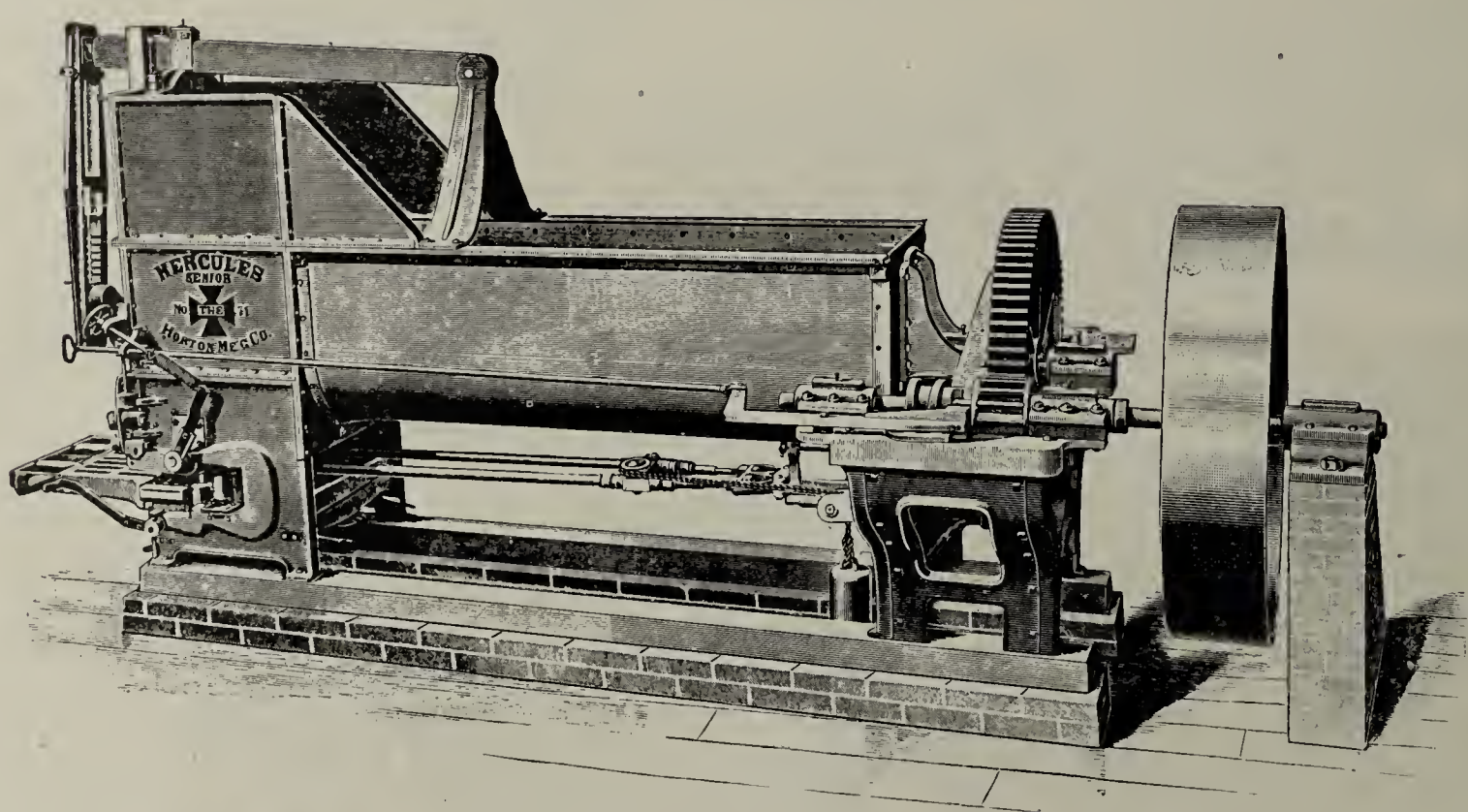
THE HENRY MARTIN BRICK MACHINE MFG. CO., INCORPORATED

Sole Manufacturers of the "Martin" Patents,

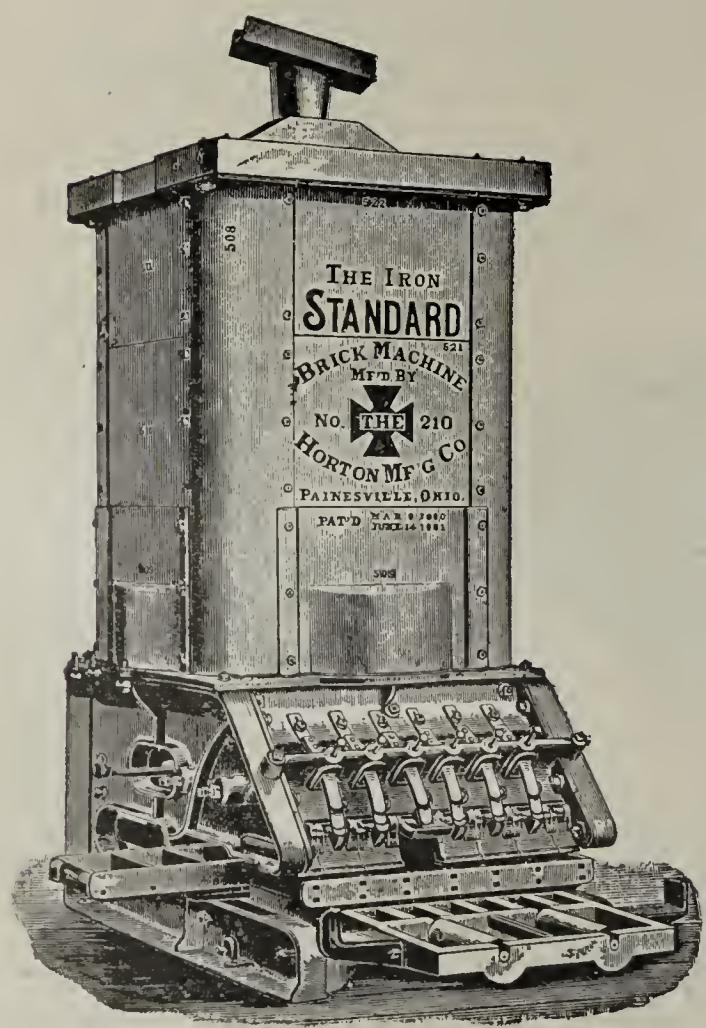
LANCASTER, PENN., U. S. A.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES



IRON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brickyard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

THE "MOCK"

Force Feed, Double Press

BRICK MACHINE

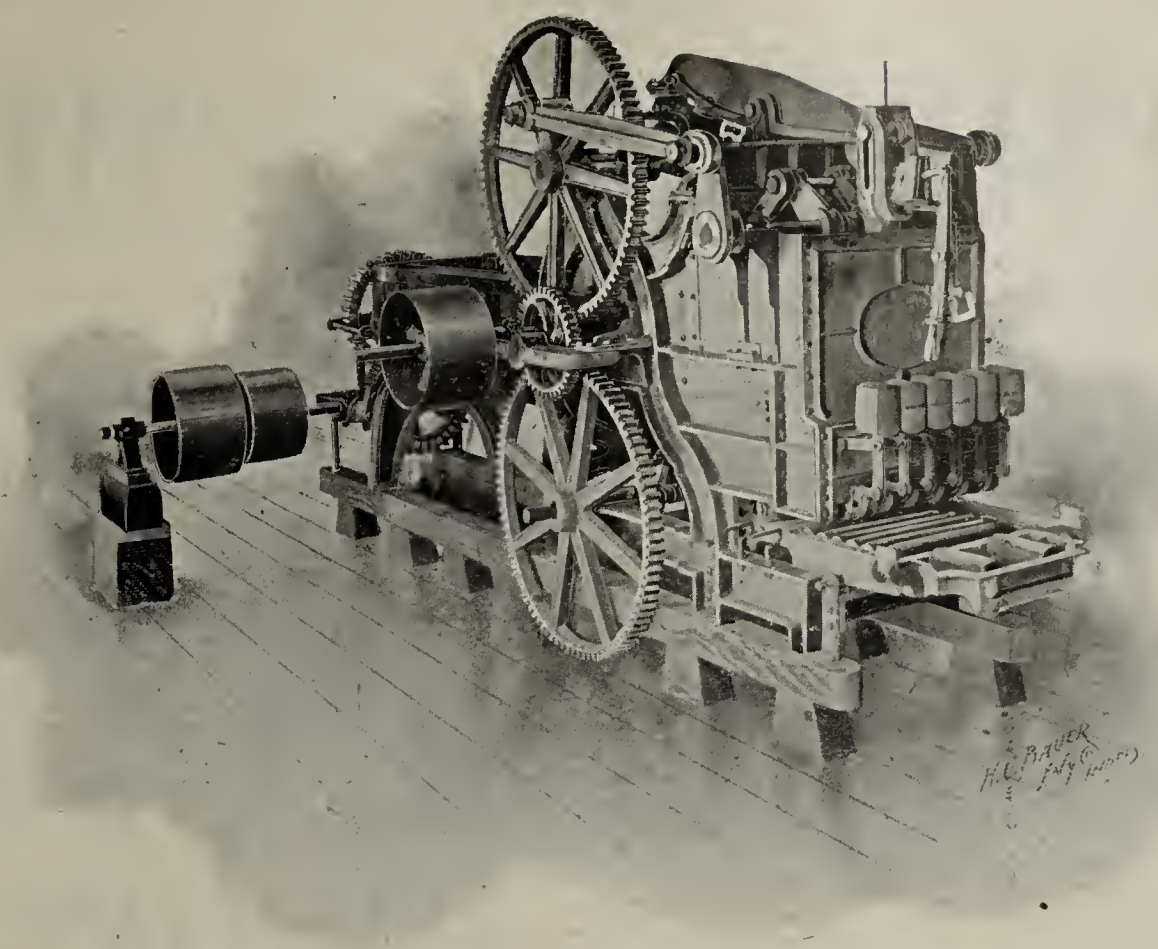
ALL IRON AND STEEL

Twenty-four revolutions of the Press Pulley to each single conjunctive appliation of the Presses.

Journals, Cog-Wheels, and Belts are shielded from wear by the ponderous Back Gear and Fulcrum advantages employed in driving the Presses.

Twelve revolutions of the Pug Pulley to one of the Pug Shaft means relief to the wearing parts.

Two or more revolutions of the Pug Shaft to each mold delivered commands PERFECT TEMPERING.



BRICK MACHINE No. 1. (Inside Press.)

The "MOCK"

Patented Portable Rack and

PALLET SYSTEM.

Simple—Satisfactory—Inexpensive. Applied to our

Sun Drier, Direct-Heat Gas Drier

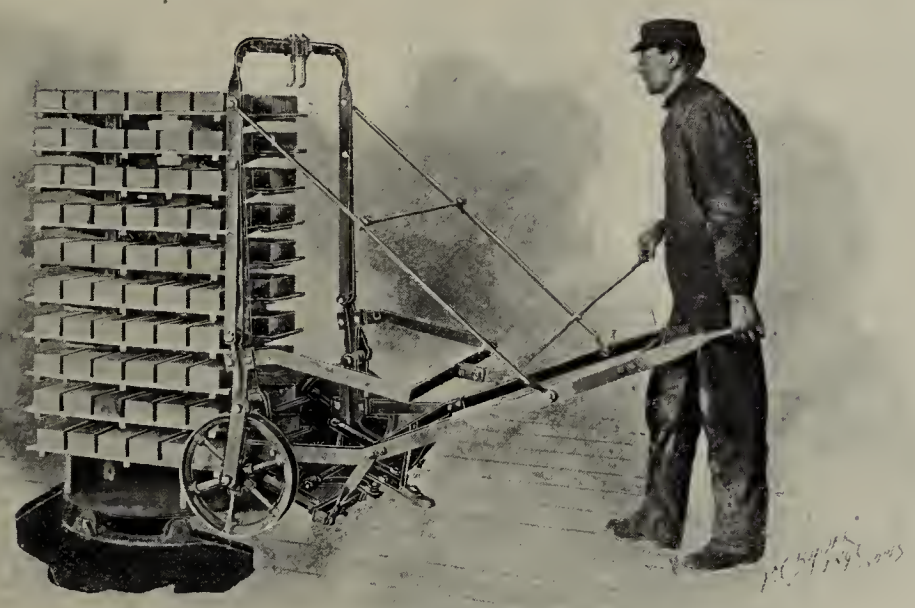
OR

TROLLEY-RACK TUNNEL DRIER

For Gas, Coal or Coke.

PLANTS OF ANY CAPACITY.

Let us Figure with YOU.



LOADED RACK WITH TRUCK.

THE LOADED RACKS are conveyed from machine to place of drying by one man, using one Truck. When the brick are dry a similar Truck conveys the Racks of brick to the kilns; thus the brick are not disturbed nor touched by hand until they are tossed to the Setters.

The Empty Racks are conveyed from the kilns back to the machine by a small boy, using the empty-rack truck.

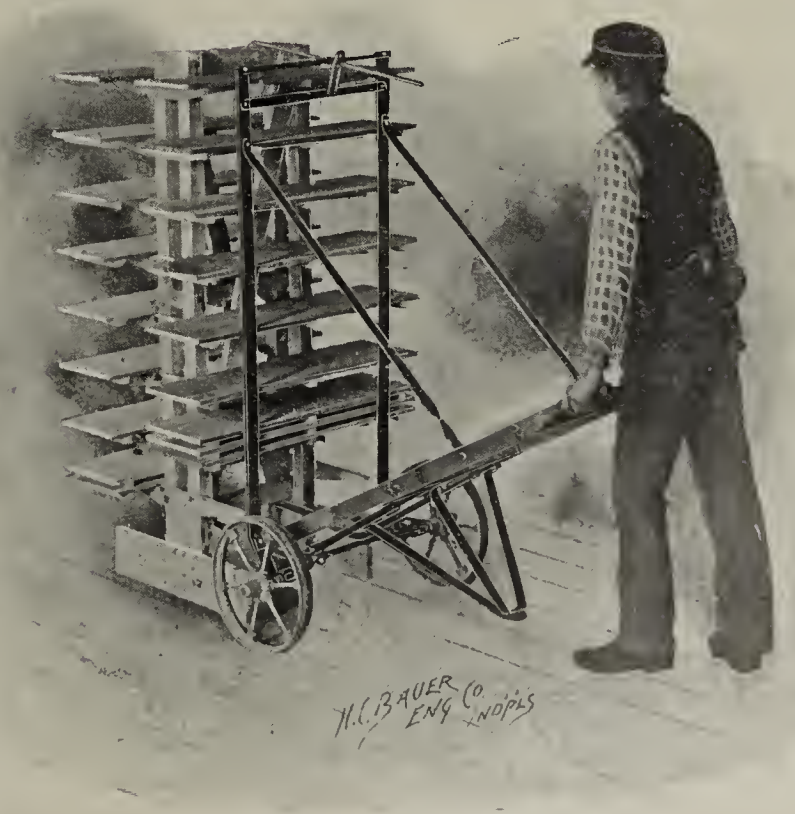
The number of Racks needed depends upon the output.

Two Turn-tables, one at each side of the dump-table, are set flush with the floor, as shown in the above illustration, for convenience in turning the Racks about while loading.

Write for No. 3 General Catalogue.

Jas. F. Mock & Co.,

Hartford City, Indiana, U. S. A.



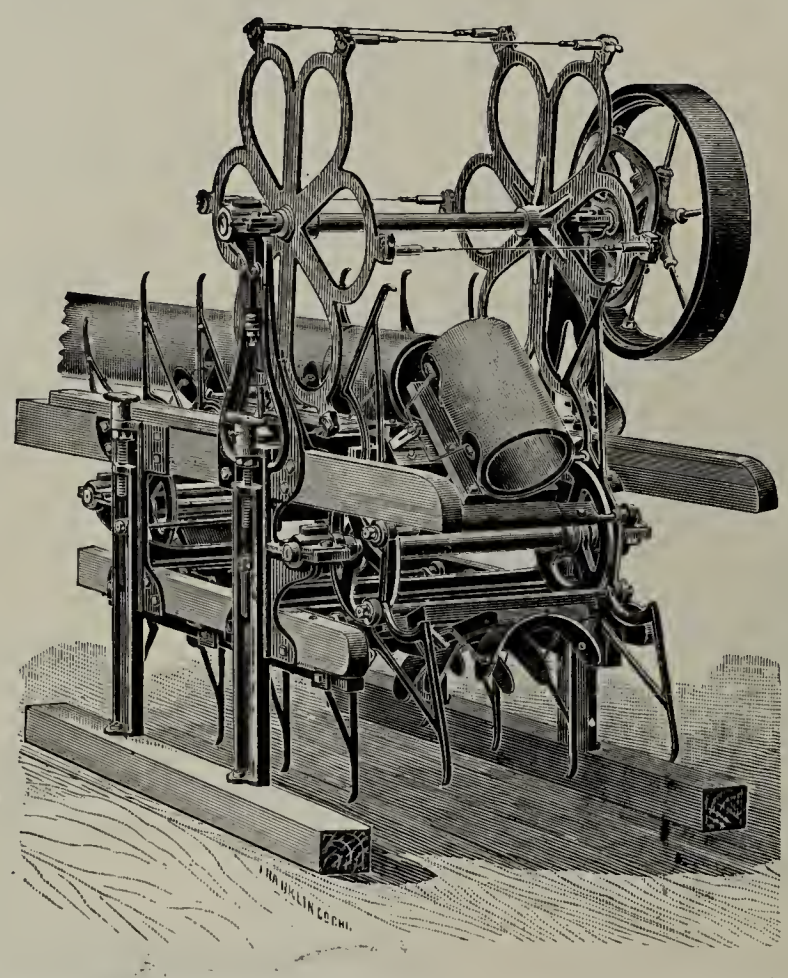
EMPTY RACK WITH TRUCK.

TRUTH IS MIGHTY.

And the Truth in regard to Our

No. 70 Automatic Tile Cutter

Is Embodied in every Claim we make for it.



We Claim

• • •

That it is a Simple, Efficient and Substantial Machine.

That it cuts Tile of equal length without upsetting or indenting.

We Claim

• • •

That it has a practically unlimited capacity.

That it is a time and Money Saver.

And we are prepared to demonstrate that **we mean what we say.** We can furnish these machines to responsible parties and guarantee

Satisfaction or no Sale.

No harm can result from a little correspondence with us.

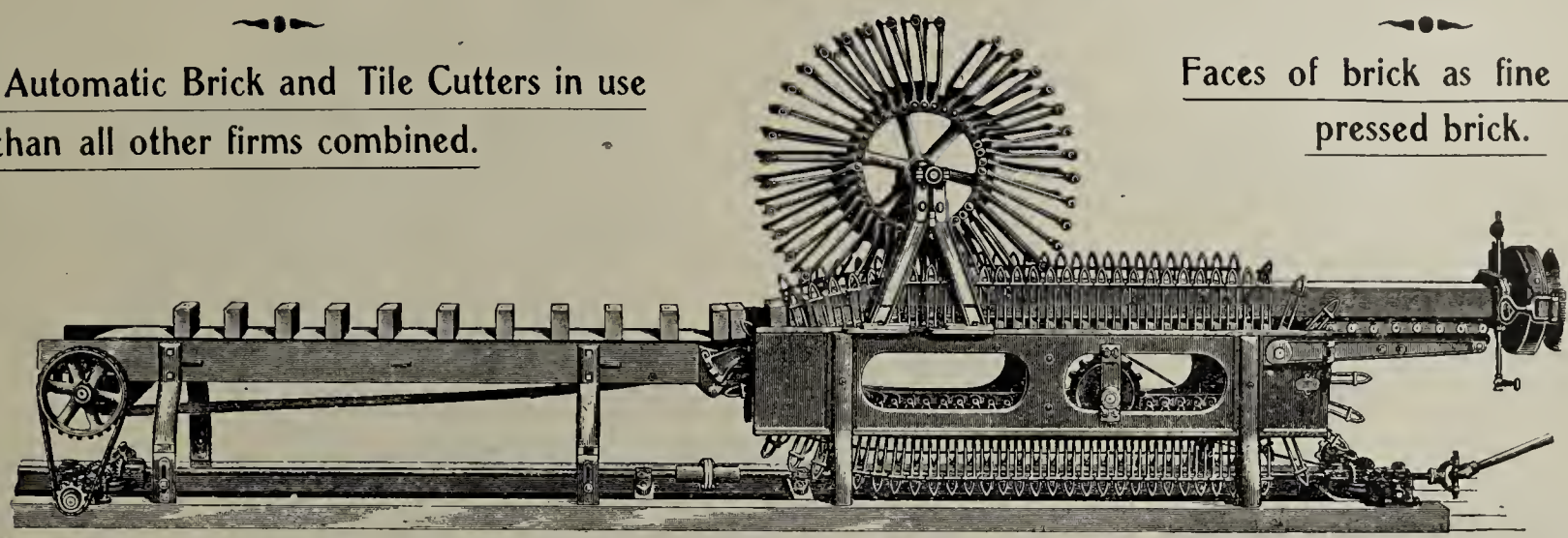
H. BREWER & CO.,

TECUMSEH, MICH., U. S. A.

The Only ABSOLUTE DOWN CUT
Cutting Table on the Market.

More Automatic Brick and Tile Cutters in use than all other firms combined.

Faces of brick as fine as re-pressed brick.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Correct in principle and mechanism.

Simplicity itself—nothing can get out of order unless broken by carelessness.

Strong and of long life—all its motions being continuously rotary.

The parts work together without jarring.

There is no halt or hesitation—every motion is prompt and positive.

Requires no expert to keep it running or in repair.

The column of clay, assisted by friction, runs the table, but all movements are regulated by clay column. When the column goes, table moves, and stops when it stops.

Breaks less than one-tenth the cutting wires that others do, and if wires are broken may be easily replaced without stopping.

The brick cut are square and true, with sharp edges and corners, and equal to the finest Press Brick.

The first brick is as good as the last, and the last as the first.

Cutting capacity practically unlimited.

READ WHAT USERS SAY:

J. D. FATE & CO., Plymouth, Ohio. Memphis, Mo., October 12, 1899.

Gentlemen:—We have been using your **Automatic Side Cut Brick Table** for two years, and are now ready to tell you what we think of it. It is beyond a doubt the superior of any other cutter now on the market for fine work, regularity in operation, self adjustment to any capacity, and last of all, **Durability.** In using other cutters, we were obliged to use either oil or water to prevent the bar of clay from sticking to parts of the table. With your Automatic table we use nothing of the kind. We simply throw the clay into the machine and the machine does the rest. The brick are all cut even and with perfect face and edges, and are delivered onto the off-bearing belt in first-class shape. Our table would cut 100,000 brick per day if we made them that rapidly, but adjusts itself to our 20,000 per day without any work on our part. Yours truly, MEMPHIS BRICK & TILE WORKS.

J. D. FATE & CO., Plymouth, Ohio. Salt Lake City, Utah, October 11, 1899.

Gentlemen:—Yours of the 3rd inst., at hand and contents noted. In regard to the **Automatic Side Cut Brick Table** purchased from you in June last, would say that we deem it **Perfection Itself.** We make from 35,000 to 60,000 brick per day, as our needs require. This by increasing or lessening the speed—the result from either speed is the same in quality. Our material is pulverized, screened and pugged, and works smooth and after the brick are cut they are delivered onto the off-bearing belt in a perfect condition, at either speed, all of one size, well defined edges and no delay from broken wires. We would not part with the system under any **Circumstances.** We cheerfully recommend it to all brickmakers. Yours truly, THE SALT LAKE PRESSED BRICK CO.

J. D. FATE & CO., Plymouth, Ohio. Des Moines, Iowa, May 11th, 1899.

Gentlemen:—We are so well pleased with the Automatic Side-cut Brick Machine that we purchased from you this Spring that we feel it our duty to send you a testimonial. We feel safe when we say it has no equal, but we are sure when we say it has no superior, because it is perfect when it comes to making a nice, square brick. We have tried it in all kinds of clay that we have here, and it makes no difference, it runs just the same. We can now make a fancy face brick, which we could not do before. We do not use power to drive the wheel—the column of clay runs it nicely. We feel that it is the best investment we ever made. If you have any prospective customer in our neighborhood, send him to our yard to see the machine, and we will venture to say he will buy your machine.

Very respectfully yours, NEWMAN BRICK & COAL CO.

"Soft Mud" Brick Machinery, both Steam and Horse Power in addition to our full line of "Stiff Mud" Machinery. Ask for Catalogue and Prices.

J. D. FATE & CO.,

Manufacturers of

BRICK AND TILE MACHINERY.

PLYOUTH, OHIO.

Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.

Agent for Virginia and North Carolina: H. L. JACOBS, Suffolk, Va.

NOTICE.

After nearly eleven years of litigation, during which time the case has been before the Supreme Court of the United States twice, our

Clay Disintegrator Patent

has been adjudged by the United States Circuit Court of Appeals for the Sixth Circuit to be valid and infringed.

We call attention to the following extracts from the opinion of the Court:

We do not find from the evidence that the operation of any of these (older) machines for the disintegration of clay was so successful as to lead to their general adoption by the trade or to work a change in the older and more laborious methods in preparing clay for brick machines, graphically described by Mr. Justice Brown in his opinion.

It is clearly established by the evidence that the Potts Machine is a success.

Nearly all the witnesses who testified to the contrary are prejudiced by their general interest in the litigation, and, **as infringers of complaint's patents,** are contradicted by their conduct. The weight of such evidence, moreover, is much impaired by the trade circulars issued by defendants, showing the success of machines which **infringe** and **Resemble, in every way,** the Potts machine. The operation of the Potts machine described by **Mr. Justice Brown** shows that **it embraces the rapid revolution of the cylinder with longitudinal blades upon it, arranged with reference to the mass of clay to be disintegrated, so that the knives upon the surface of the cylinder shall strike with hard blows the mass of clay and clip off or tear off from the mass presented to the cylinder bits of clay and carry them into receptacle below.**

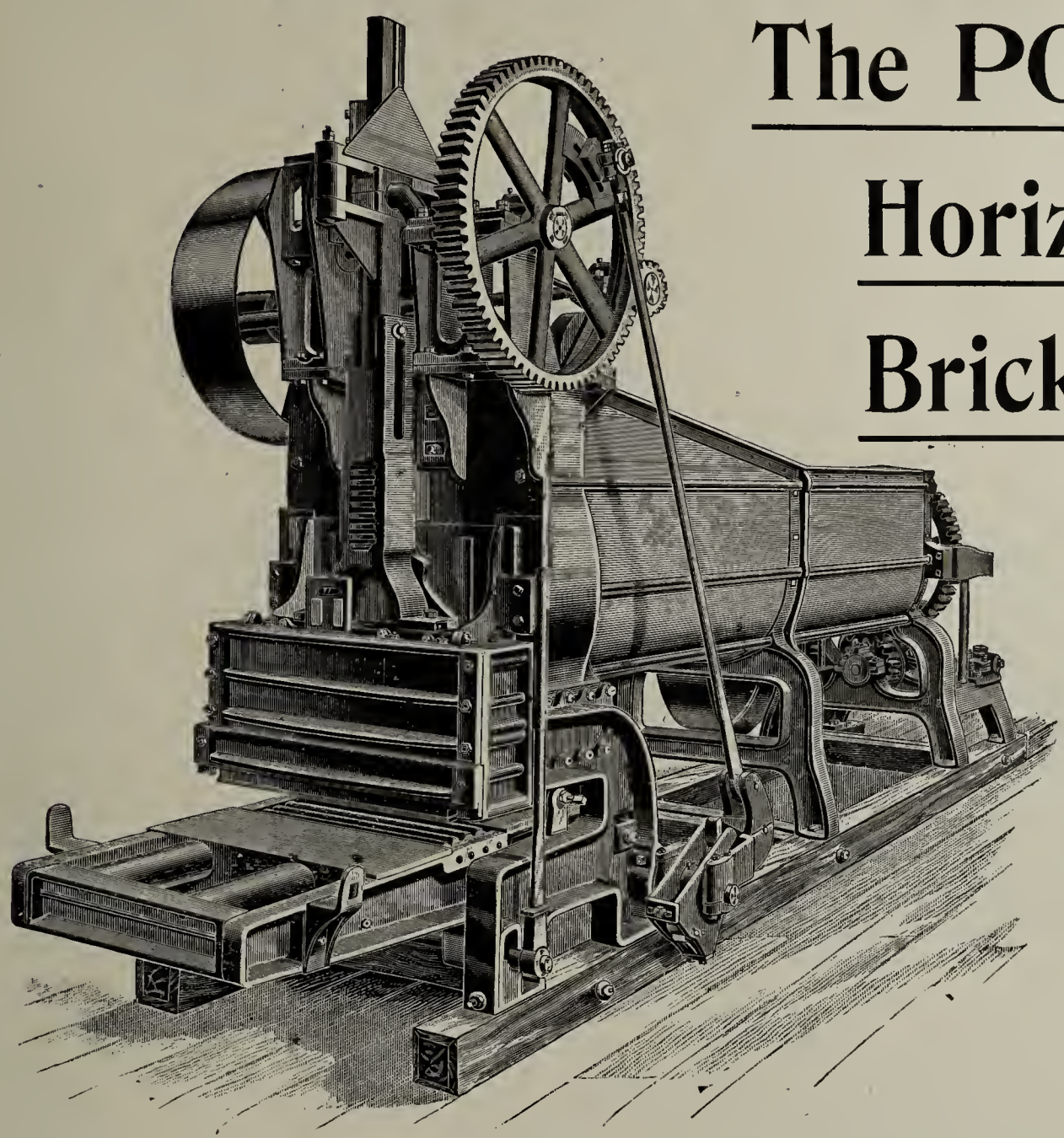
☞Our rights having now been confirmed, both by the Supreme Court of the United States, and by the Circuit Court of Appeals for the Sixth Circuit, all persons are hereby notified that we shall expect said rights to be respected, and that all infringements will be promptly and vigorously prosecuted.

Persons owning or operating infringing machines, which they have bought heretofore, will advance their own interests by promptly settling with us.

C. & A. POTTS & CO.,

Indianapolis, Ind.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

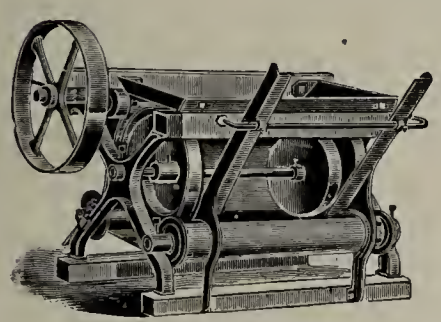
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

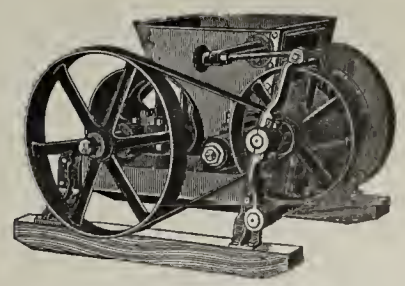
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



DISINTEGRATORS.

When in need of Machinery or supplies, we can save you money.

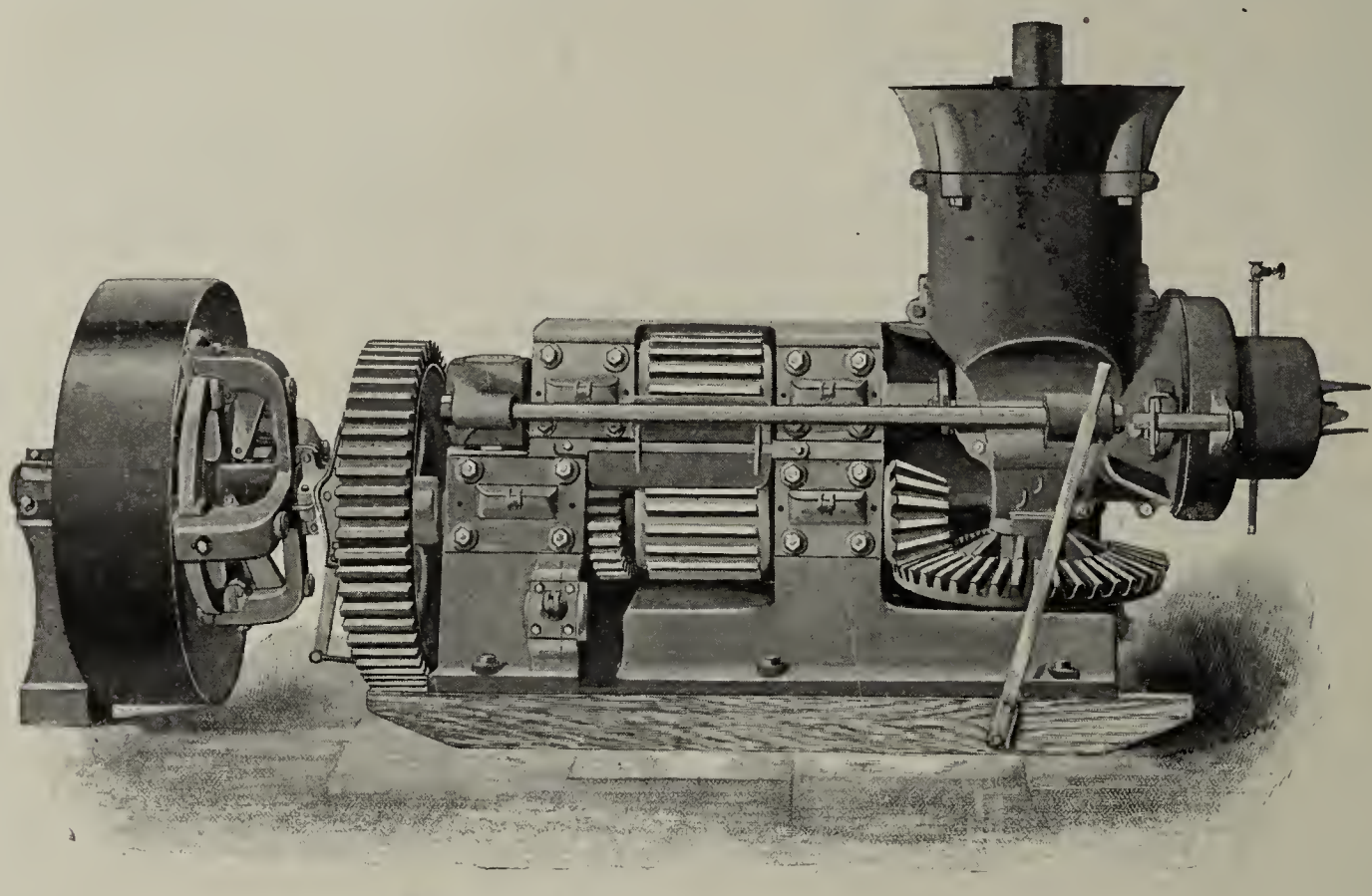
C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

The WONDER

IN WORK AS WELL AS IN NAME.



BIG WONDER BRICK MACHINE: Capacity 60,000 Brick Per Day.

The wise man is guided in his choice of an article largely by the adaptability of same for his particular purpose.

There is something about the **Wonder Brick Machine** that appeals to the practical brickmaker. When you examine the machine you will see why, and when you use one, you will have no other.

Our strength is in our preparedness. We are in a position to handle anything that you may intrust to us in a way that will throw new light on the matters of service and quality of work.

The Wallace Mfg. Co.,

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

Frankfort,
Indiana.

SOUTHERN AGENT: Frank H. Reid, Charlotte, N. C.

The Wallace Mfg. Co.,

FRANKFORT, INDIANA.

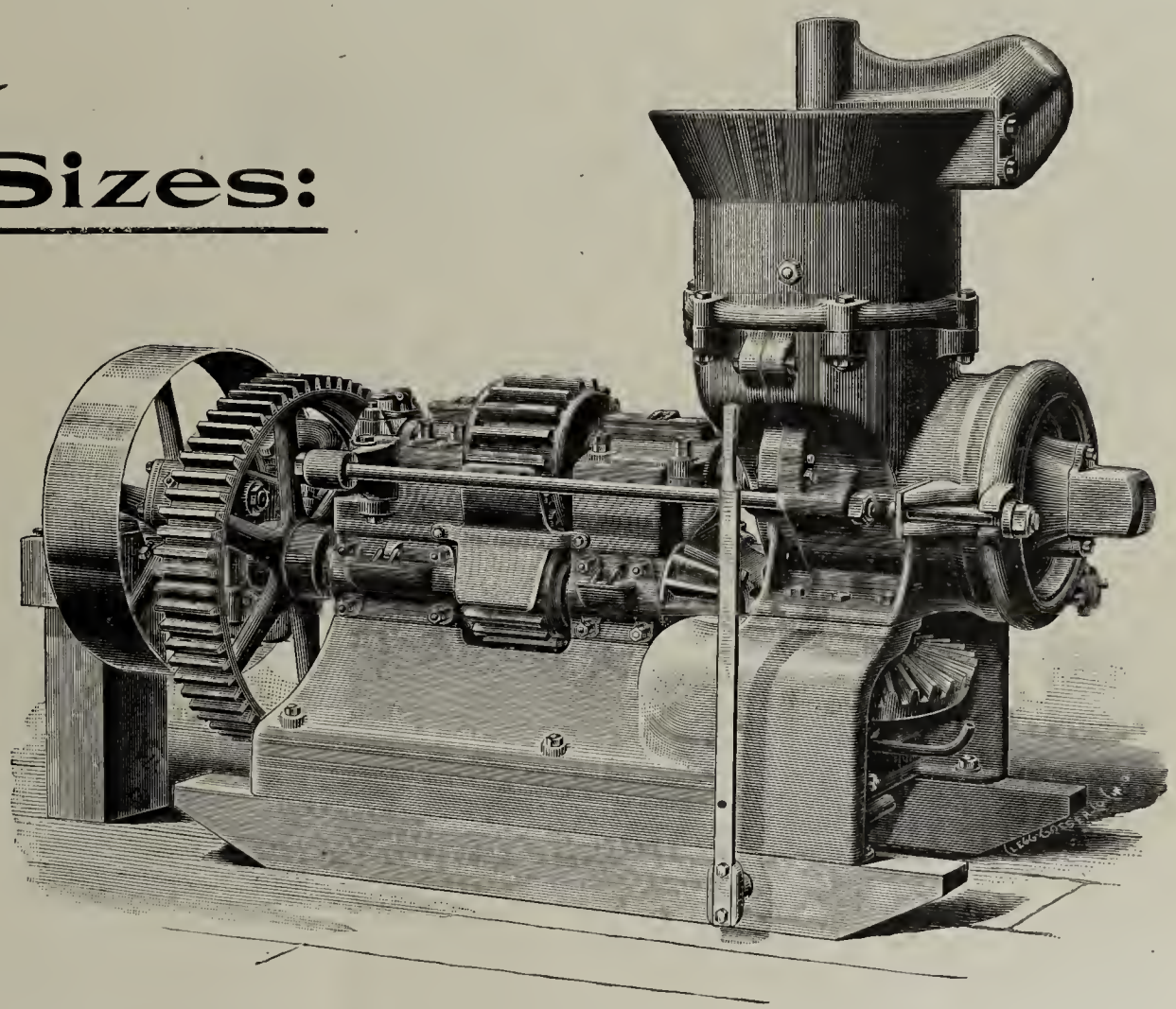
THEIR NAME on any piece of Brick Machinery is sufficient guarantee of its high quality.

Our machinery has, in the minutest details, been brought up to the latest development of mechanical knowledge. Times change and we change with them, thus the **Wonder Brick Machine** is up-to-date in every respect. It can well be called the **World Wide Working Wonder.**

MADE IN

Four Sizes:

Capacity,
25,000 to
100,000
Brick per
Day.



The Wallace Mfg. Co.,

Frankfort,
Indiana.

CHICAGO AGENTS:
CHICAGO BRICK
MACHINERY COMPANY,
Chicago, Ill.

SOUTHERN AGENT: Frank H. Reid, Charlotte, N. C.

Merit, Not Luck . . .

A YEAR AGO we called attention to the fact that thirteen Eagle Represses were working in Galesburg, Ill. We ridiculed the assertion that "13" was an unlucky number and defied the bad omen. Part of what was said is shown in the paragraph in the corner of this page. Read it. Merit has knocked out the "13." Two more Eagle Represses have been sold in Galesburg, and now 15 Eagles will work there, giving abundant satisfaction and testifying more strongly than words the merits of the Eagle. Galesburg is the paving brick city of the World. It turns out more pavers than any other. Every repressed paver in Galesburg will be pressed on an Eagle Repress. No other Repress will be used in Galesburg after these two Eagles are delivered. Isn't this a record to be proud of? Doesn't it suggest to you that the Eagle must be the best machine?

The two new Eagles will succeed three other presses of another make in the Purington plant. Two Eagles will do the work of three others. This will make nine Eagles in the Purington Factory. It was a question of economy with the Purington people. Speaking of the matter they say that the three presses of another make have cost for repairs three times their original price, while the seven Eagles have cost practically nothing. It's evidently economy to have the Eagle because it's the best. It's built for profit to the buyer. Does as much and more than we promise. Does it better and faster and at less cost. Send for particulars on the Eagle or any other Clay-Working Machinery.

13 The Unlucky Number 13

That is the number of Eagle Represses we have in operation in Galesburg, Ill. We don't consider 13 an unlucky number! There were 13 original States. See what a grand Nation has grown from this nucleus of 13. The American Eagle perched proudly upon the American Shield, originally screamed for but 13 stars and bars. Today there are 45 stars upon our flag. Why, then, should we fear the omen of 13? We are proud that the Eagle of The American Clay-Working Machinery Co. should be perched over 13 of the American's Eagle Represses in Galesburg. There are other manufacturers—several of them—who would be glad of the opportunity to brave the superstitious omen under similar circumstances. It's not a question of luck, but of merit. People who use the Eagle Repress are pleased with it. When they enlarge they buy another, and so it goes. In Galesburg the 13 Represses are, every one, giving the best of satisfaction. That's the way with all our machinery. You buy it and are satisfied—not only today, but the next year and the next decade.

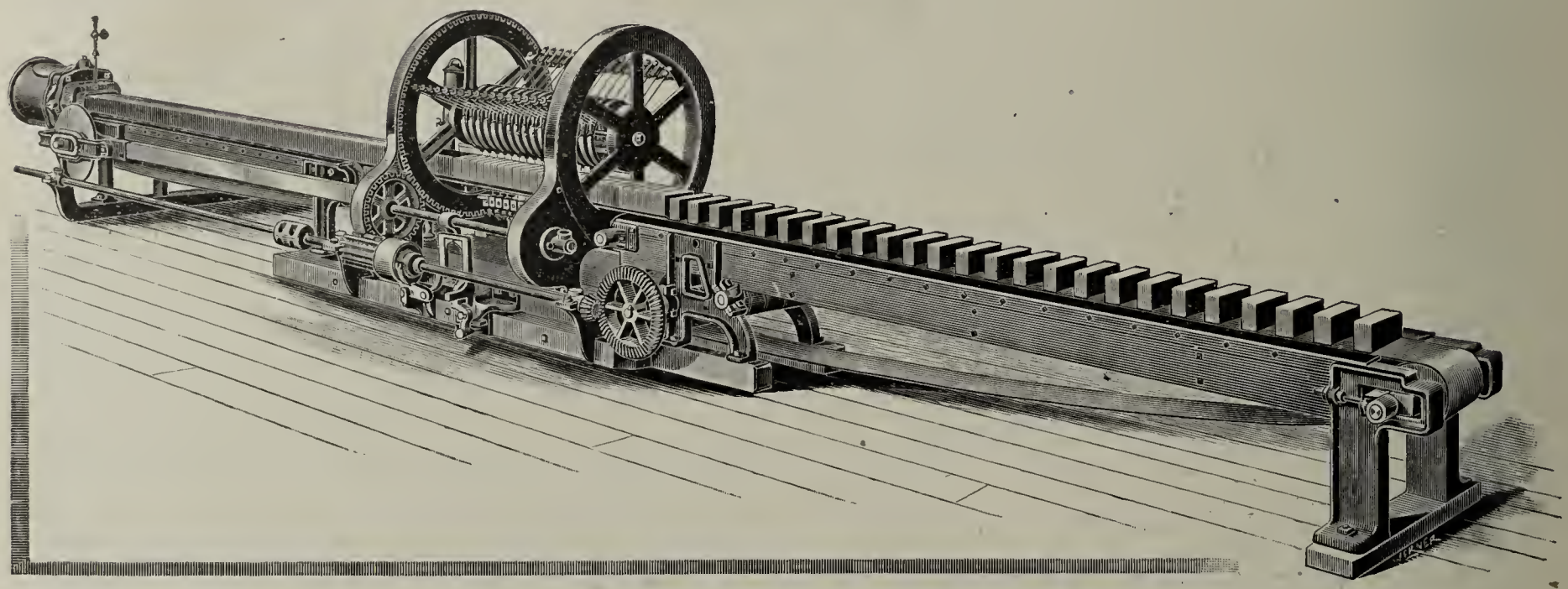
The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

The Bucyrus Steam Tunnel Dryer
THE BUCYRUS STEAM TUNNEL DRYER
IF YOU ARE LOOKING FOR A DRYER THAT WILL REMOVE MORE MOISTURE IN LESS TIME, WITH LESS FUEL THAN ANY OTHER DRYER ON THE MARKET THEN WHAT WE SAY AND WHAT USERS OF THE BUCYRUS DRYER SAY WILL INTEREST YOU.
WRITE US.
IT WORKS WHILE YOU SLEEP.
THE DRYER THAT DRIES.
MANUFACTURED BY
THE AMERICAN CLAY WORKING MACHINERY CO.
BUCYRUS, OHIO, U.S.A.
EQUIPPERS OF COMPLETE CLAY-WORKING PLANTS

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



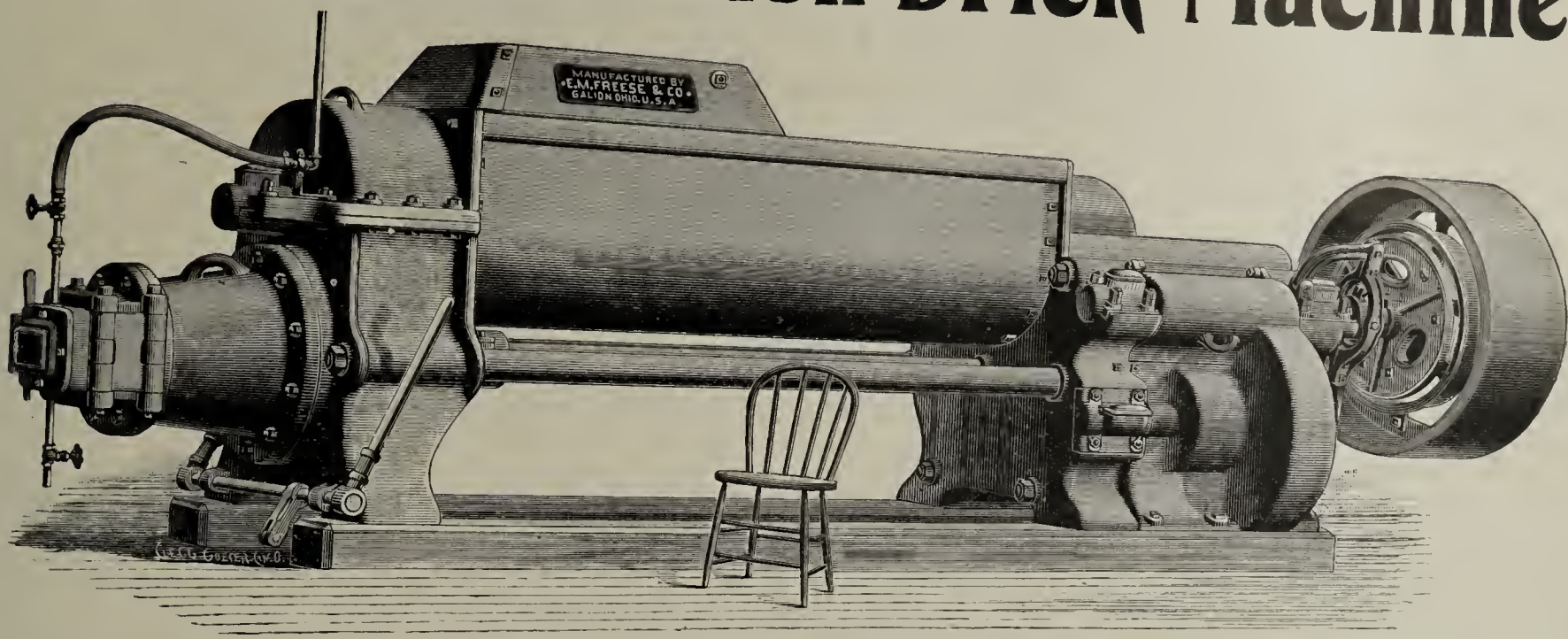
A New Rotating Cutter for Side Cut Brick.

POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

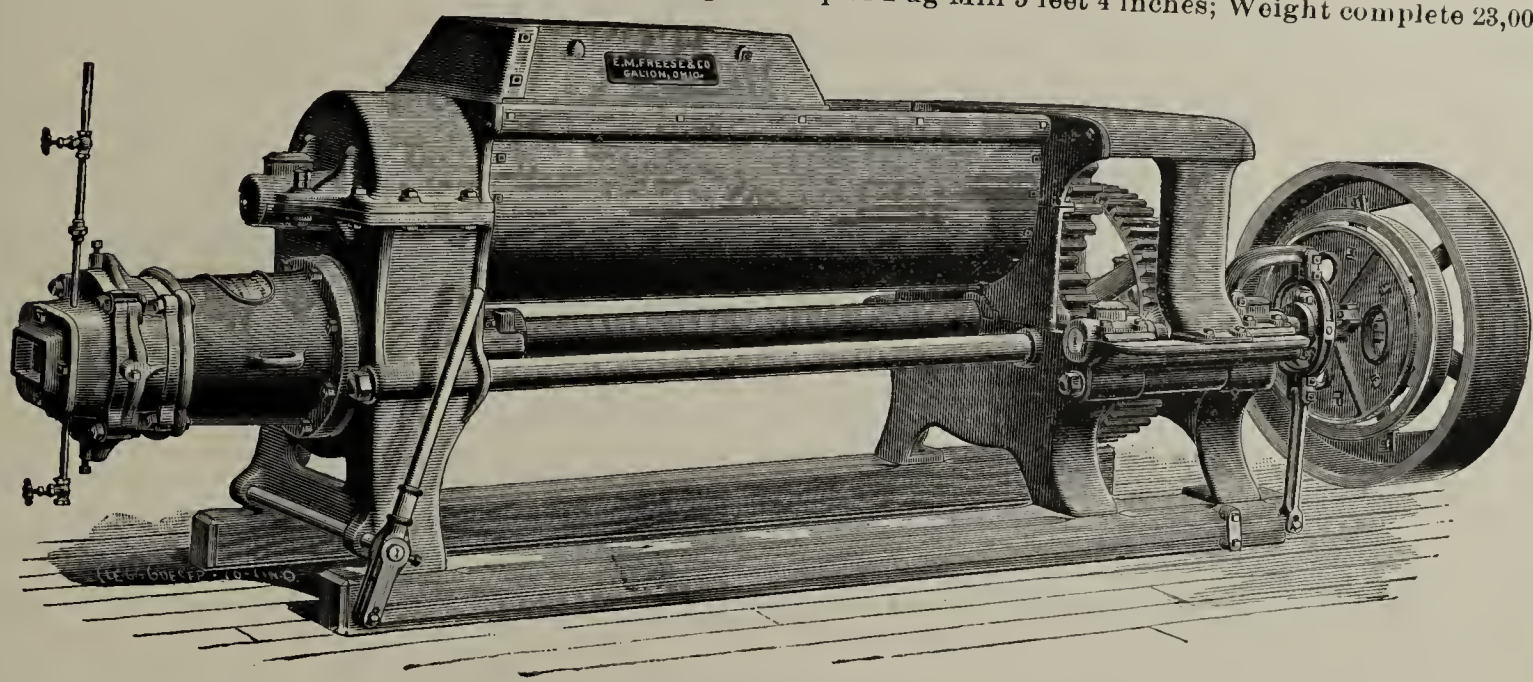
E. M. FREESE & CO.,
Galion, Ohio.

The Original Union Brick Machines



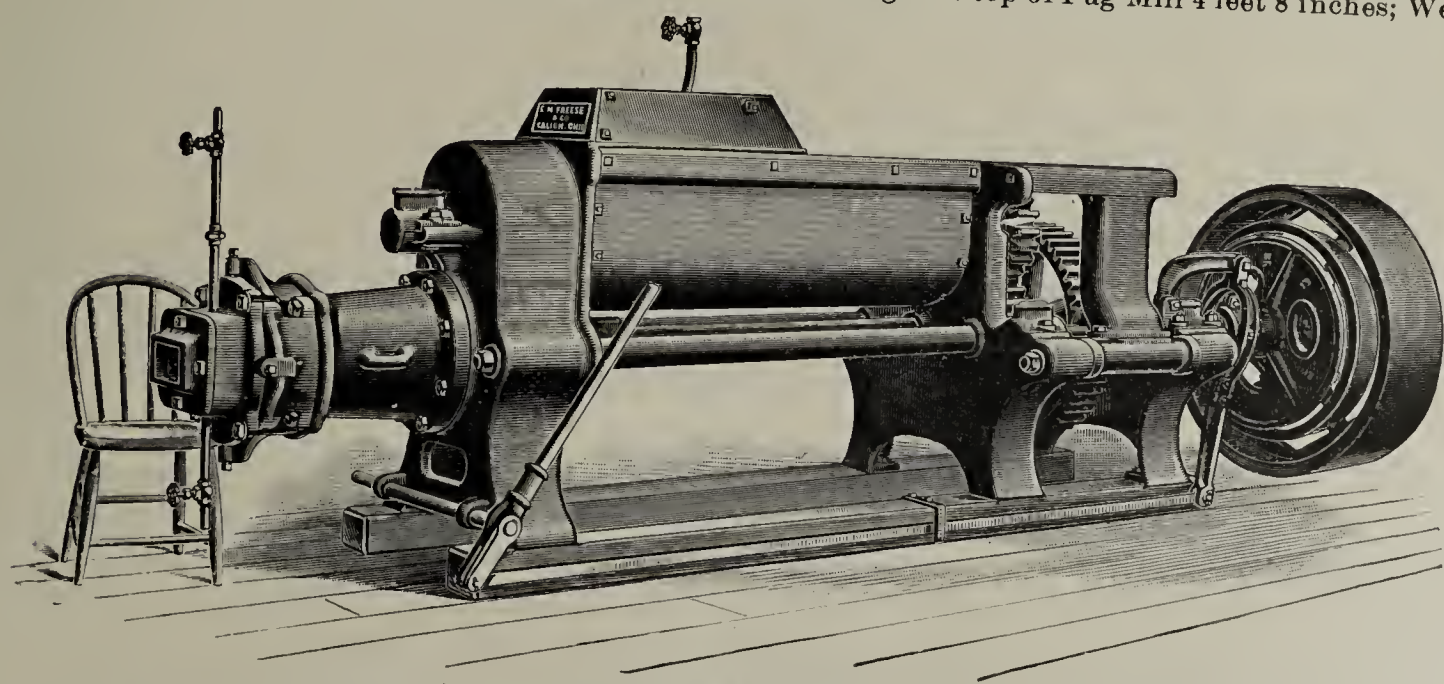
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

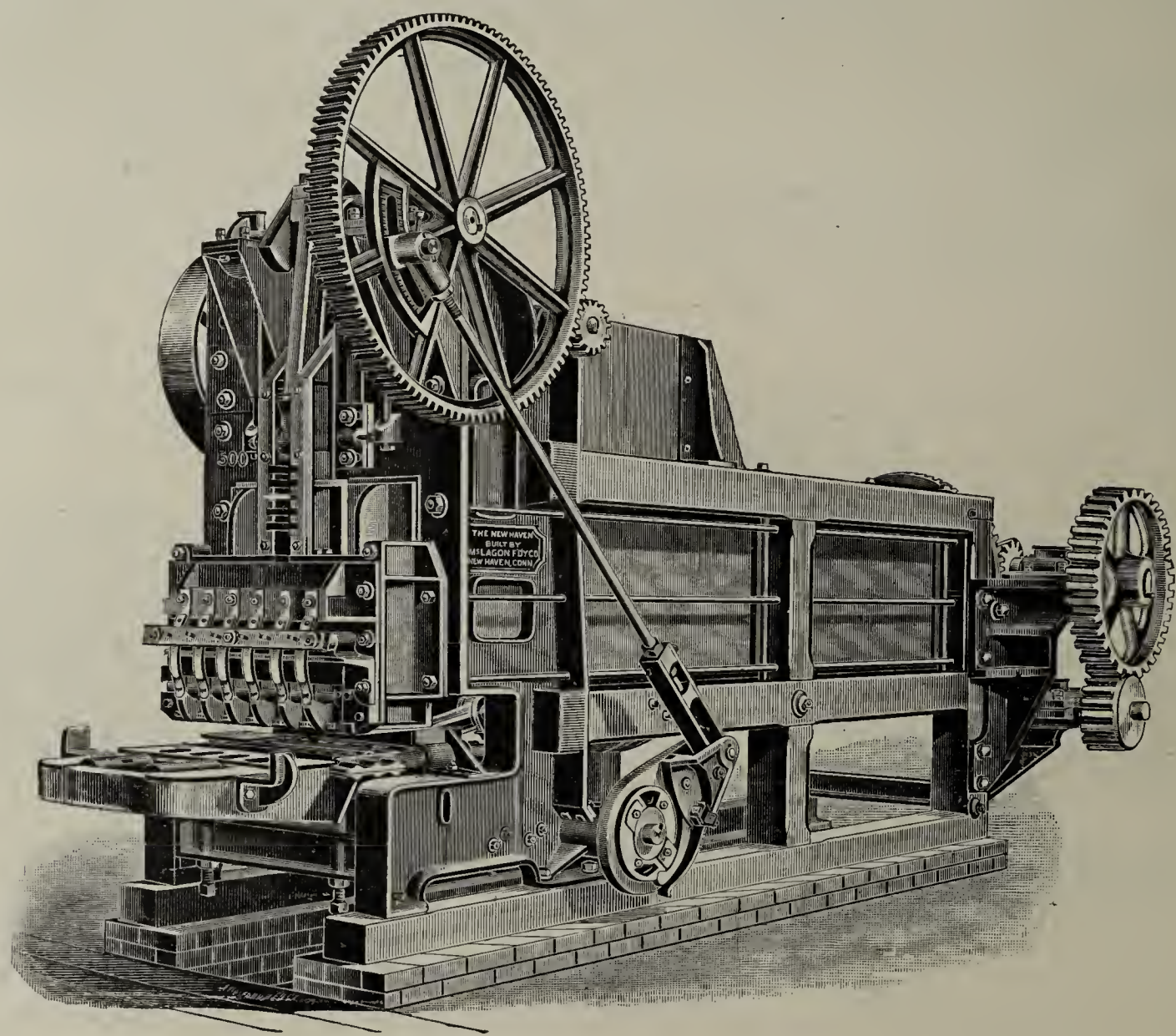
No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

Only One Break in Two Years.

That Due to Carelessness.
$7.50 Paid for the Repairs.



READ THIS:

ALLENTOWN, PA., January 11, 1900.

THE EASTERN MACHINERY CO., New Haven, Conn.

Gentlemen:—Enclosed please find check for $7.50 for bill to Nov. 9, 1899.

This was **the first break we had in two years** since we used your machine, and this we think was caused by carelessness.

Respectfully, KICHLINE BRICK CO.

WOULD YOU LIKE A MACHINE OF THIS CHARACTER?

The Eastern Machinery Co.,

NEW HAVEN, CONN.

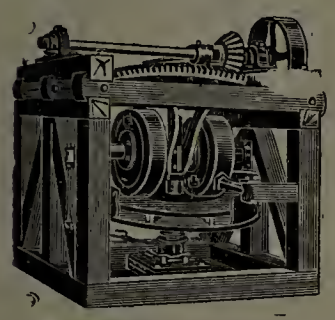
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

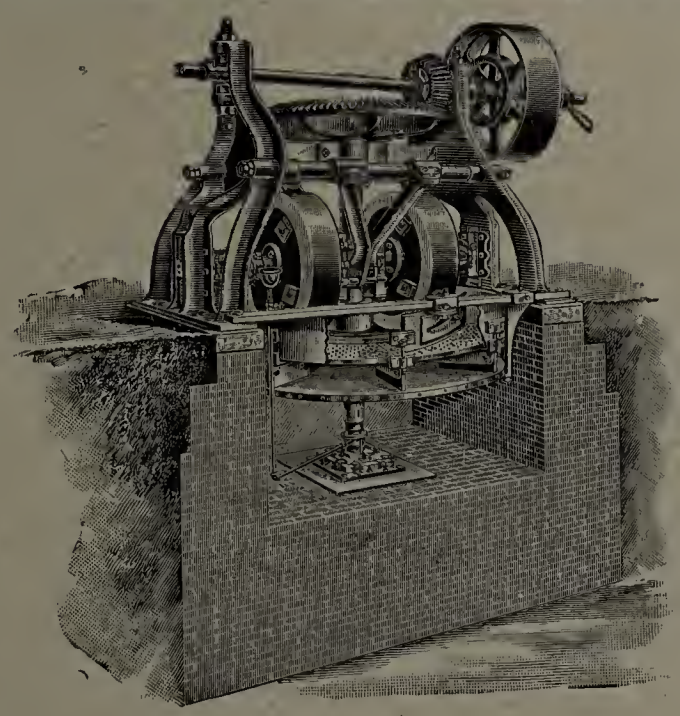
MANUFACTURERS OF

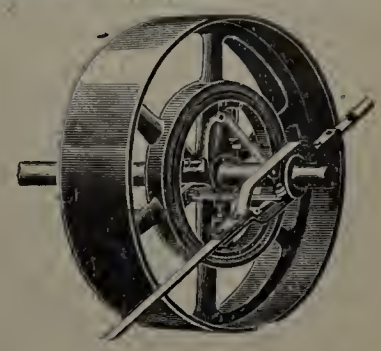
Brick Machinery.

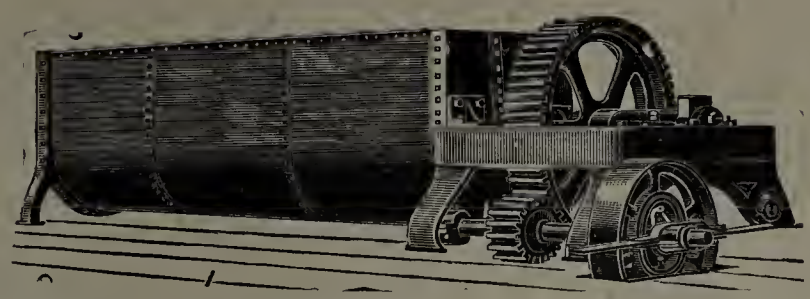
COMPLETE EQUIPMENTS.

Tile Machinery









Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

The "A. B. C." BRICK DRYER

IS USED by progressive brickmakers all over this country and Europe. Why? Because by its use the cost of drying brick is reduced to the minimum, and the results in other ways are entirely satisfactory. Catalogue on request.

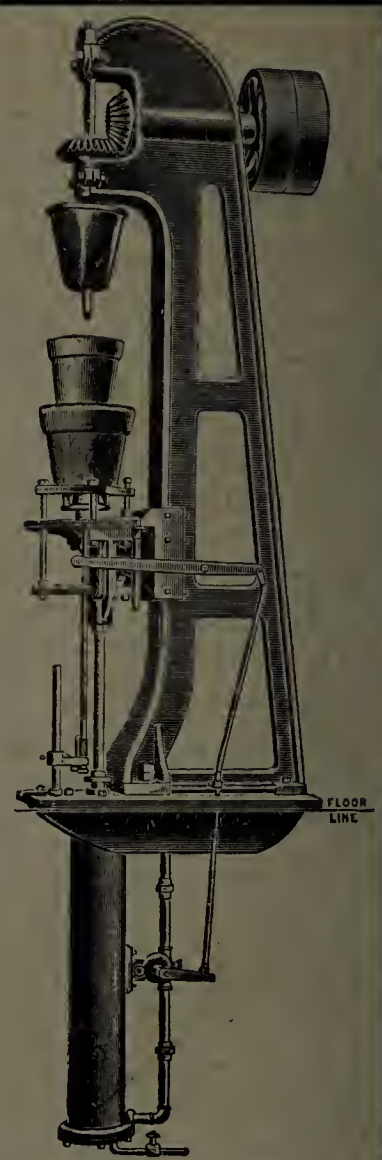
American Blower Company,
Detroit, Michigan.
New York. Chicago. London.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS, OHIO, U. S. A.

MANUFACTURERS OF ALL KINDS OF

Clayworking Machinery.



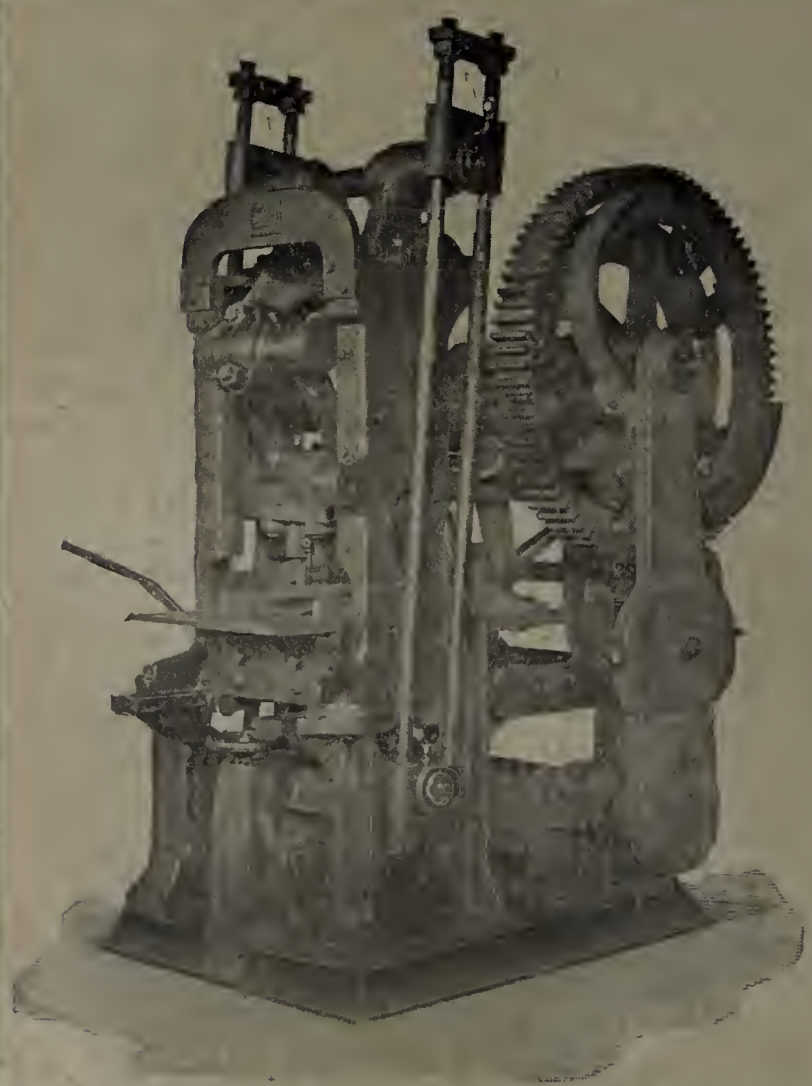
The accompanying cut shows our improved machine for making

Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



Single or Double Mold Steam Dry Press, Made by the Ohio Ceramic Engineering Co.

When You Stop to Think

Isn't a New Repress just What You Need in Your Business?

Write for Catalogue.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

Table of Contents, Page 284.

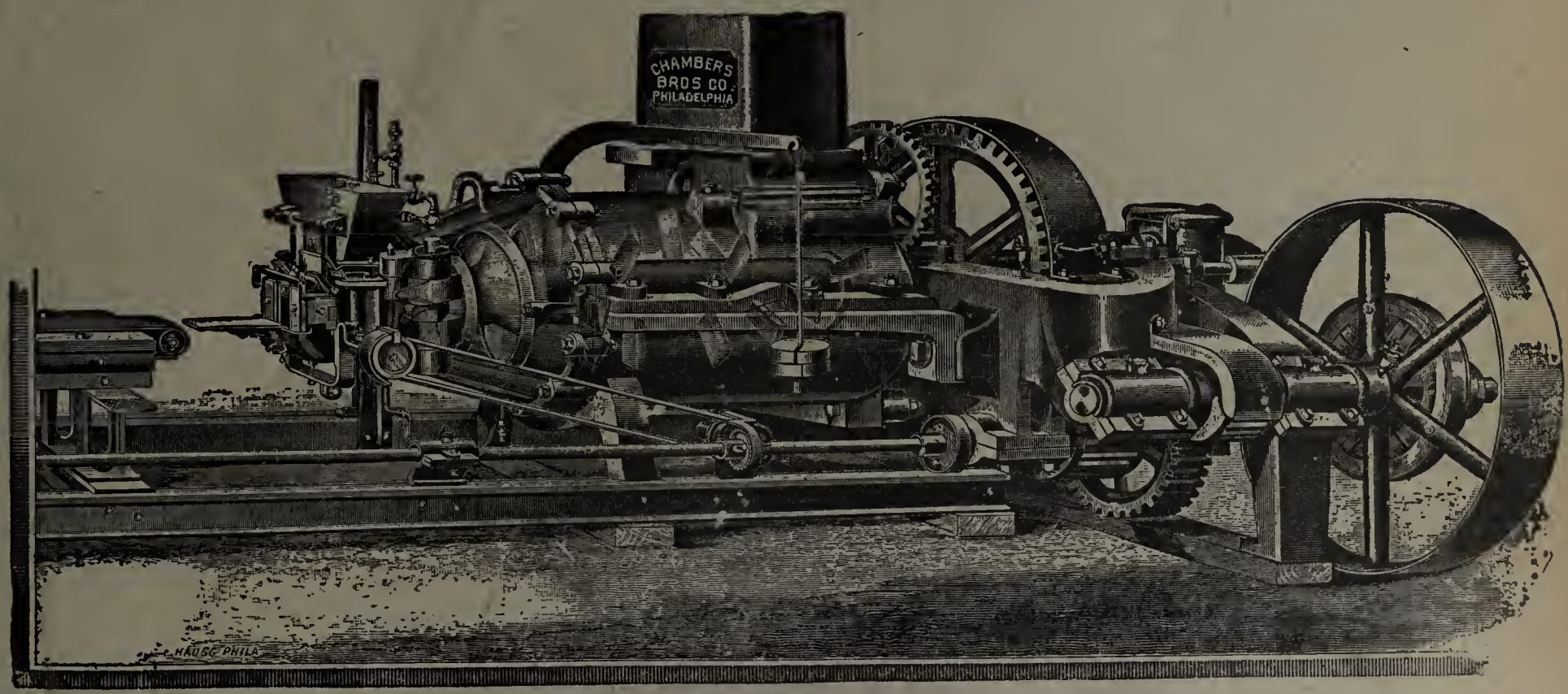
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII, No. 3. INDIANAPOLIS, IND., MARCH, 1900. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

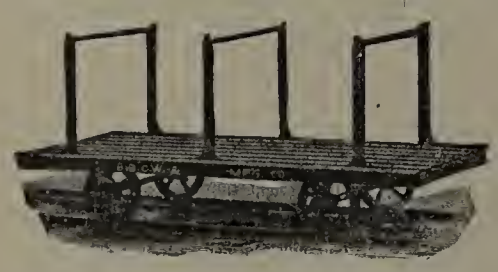
PHILADELPHIA, PA.

The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

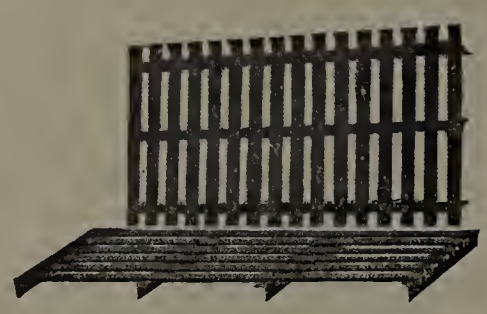
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

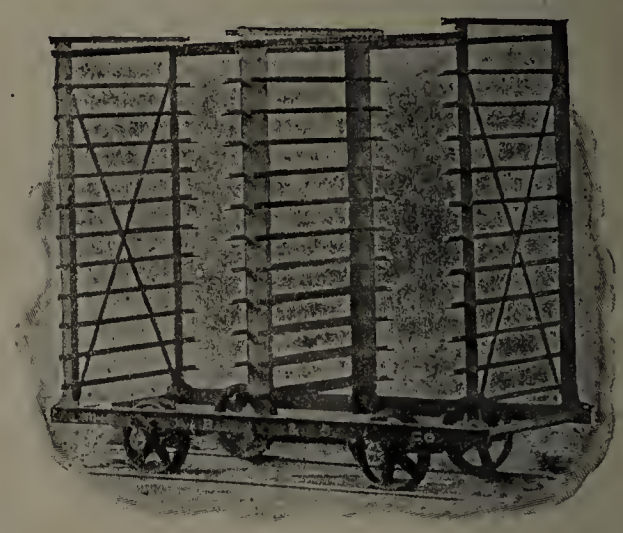
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet 7 inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name. Page.

American Clay-Working Mach Co, The 307, 314
Anderson Foundry and Mach. Works 308, 239
Chisholm, Boyd & White Co, .228, 229
Chicago Brick Machinery Co... 232
Many, Frank B 296
Fernholtz Brick Machinery Co. The 233
Progress Press Brick and Machine Co ....
Ross-Keller Brick Machine Co. ..
Western Machinery & Supply Co 297

Brick and Tile Machinery.

Adrain Brick & Tile Machic Co. 303
American Clay-Working Mach Co., The 307, 314
Anderson Foundry and Mach. Works 308, 230
Baird and Son, H. C 297
Brewer H. & Co 319
Chambers Brothers Co 225
Chicago Brick Machinery Co... 232
Eastern Machinery Co, The 322
Fate & Co., The J. D 315
Freese, E. M. & Co 320, 321
Henry Martin Brick Mach. Mfg Co, The 311
Hensley, J. W 227
Horton Mfg Co, The 312
Kells & Sons 297
Leader Mfg. Co, The 309
Madden & Co 295
Mock & Co., Jas. F 313
Ohio Ceramic Engineering Co., The 324
Potts & Co., C. & A 316, 317
Prangley, James 308
Raymond Co., The C. W 285, 287
Steele, J. C., & Son 302
Stevenson & Co 323
Taplin, Rice & Co 232
Wallace Mfg. Co, The 318
Wellington Machine Co, The... 289
Wiles Co., A. M. & W. H 302

Brick Kilns and Dryers.

Alsip, S. H 293
American Blower Co, The 324
Bushong, M. M 305
Carson, J. W 298
Eudaly, W. A 305
Haigh, H 304
Illinois Supply and Construction Co, The 293, 310
Morrison & Co., R. B 304
Phillips, S. G 294
Pike, E. M 296
Reppell, L. H 304
Swift, F. E 291
Standard Dry Kiln Co, The 234
Yates, Alfred 297

Brick Yard Supplies.

Atlas Bolt & Screw Co, The 226
Arnold, D. J. C 303
Buhl Malleable Company 295
Cleveland Car Co 231
Caldwell & Son Co., H. W 294
Carmichael, T. W 297
Carnell, Geo 302
Coldewe & Co., G 278
Cox, Geo. S 298
Duplex Heating & Machine Co. 303
Elder & Dunlap 298
Frost Engine Co 306
Hardin & Gray 299
Harrington & King Perforating Co, The 227
Henry Martin Brick Machine Mfg. Co, The 311
Horton Mfg. Co, The 312
Jeffrey Manufacturing Co, The. 299
Kendall & Flick ....
Marion Steam Shovel Co 309
Main Belting Co 291
Mershon & Co., W. B 296
Newton, A. H 299
Newton A. C 299
Phillips & McLaren 296
Rockwood Mfg. Co, The 295
Turner, Vaughn & Taylor Co... 324
Vanduzen Co., The E. W 297
Williams Patent Crusher and Pulverizer Co 233

Miscellaneous.

Burt Manufacturing Co 284
Chesapeake & Ohio R. R 299
Clinton Paving and Building Brick Co., The 301
Coaldale Brick & Tile Co., The. 300
Cotton Belt Route 298
Dean Bros. Steam Pump Works 297
Evens & Howard 297
Gabriel & Schall 296
Green & Hunter Brick Co 300
Harper-Norton Shale Brick Co The 300
Higley & Co, J. L 301
Indianapolis Engraving and Electro Co 296, 299
Indiana, Decatur & Western ... 298
Lake Erie & Western 298
Miller Oil and Supply Co 296
McAvoy Vitrified Brick Co 301
New York Brick and Paving Co 300
Osborne, W. R 297
Pennsylvania Line 299
Pittsburg Tubular Steel Whiffletree Co 291
Purington Paving Brick Co, The 301
Terre Haute Brick and Pipe Co. 301
Vandalia Line 299
Ads., Small Wanted, For Sale, etc.

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

Samples or blue prints with prices furnished on request.

THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

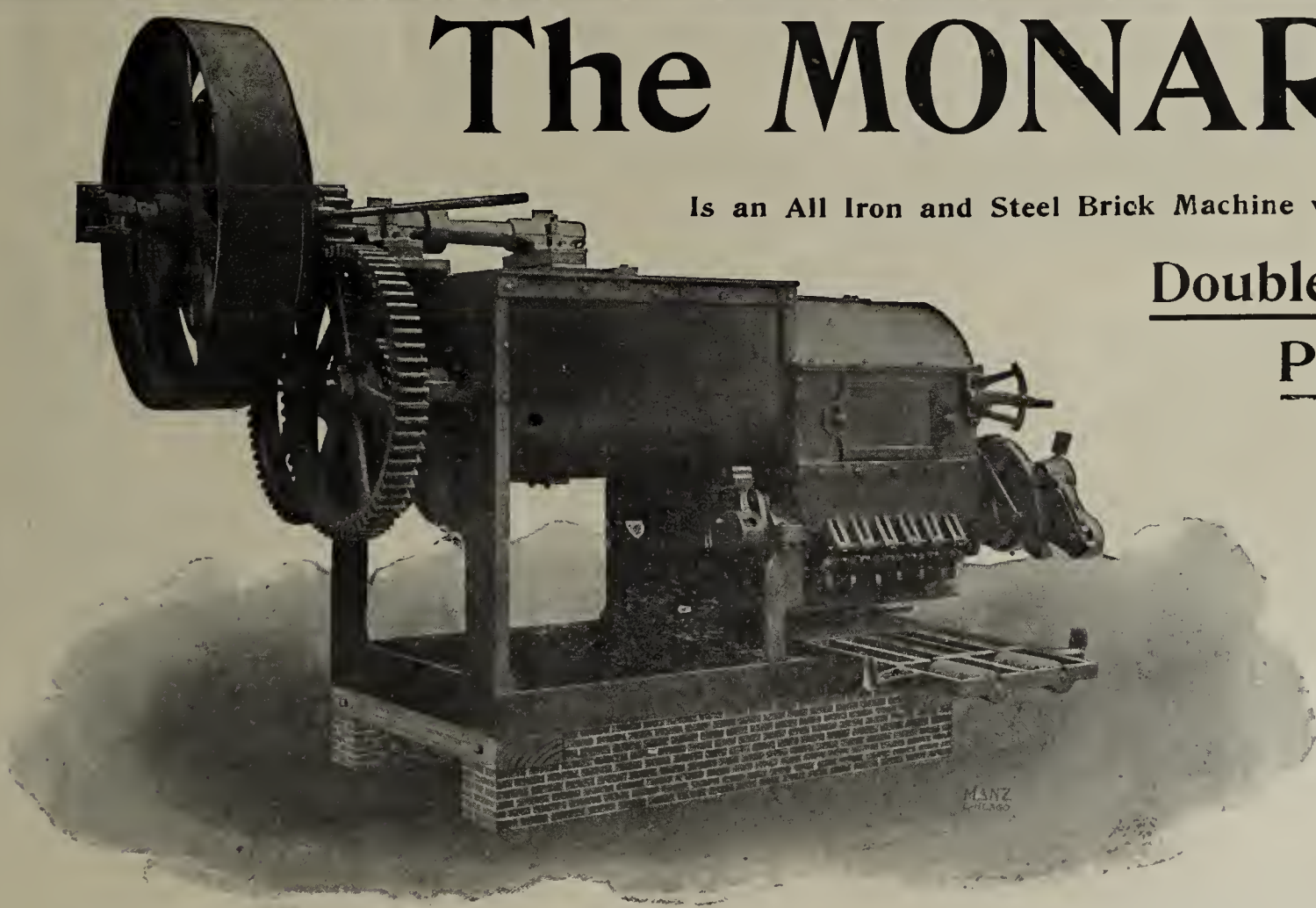
Is an All Iron and Steel Brick Machine with

Double Pug Mill.

• • •

SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •



Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

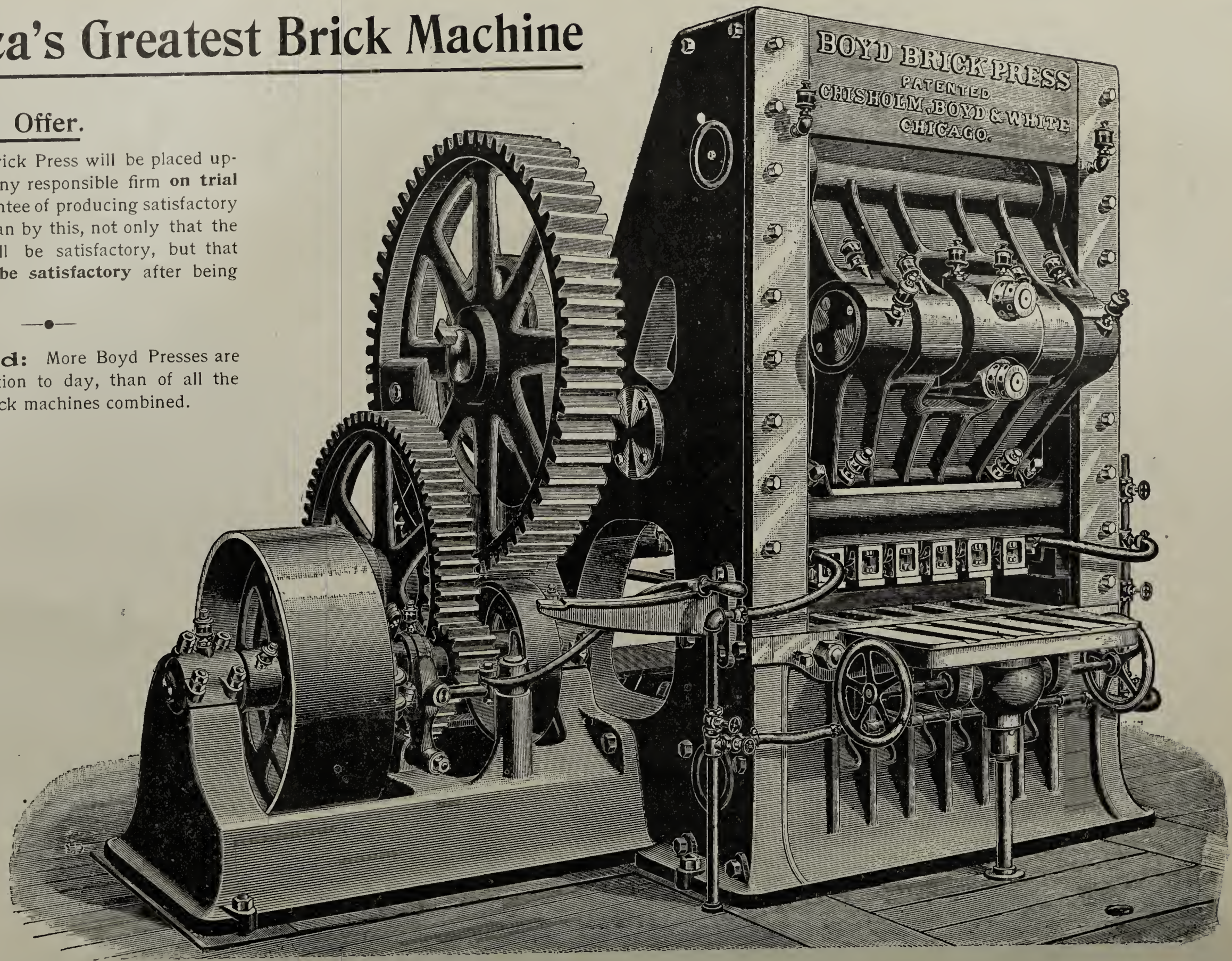
W. L. KIDNEY, Sales Agent, Capetown, South Africa.

America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets.

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A

The Powerful Pressing Mechanism of the Boyd Press Lasts Forever.

Great for Strength.

The engraving shows the heavy forged steel Side-Bars, the Toggles, the upper and lower Crossheads, with the plungers in position. These comprise the "pressing mechanism" of the Boyd Brick Press, and take all the strain exerted in pressing the bricks in the molds between the plungers. They can never wear out and cannot be broken. These pressing parts are suspended upon the lifting levers, and the side frames of the press only guide the side-bars in their upward and downward movements.

Great for Beauty.

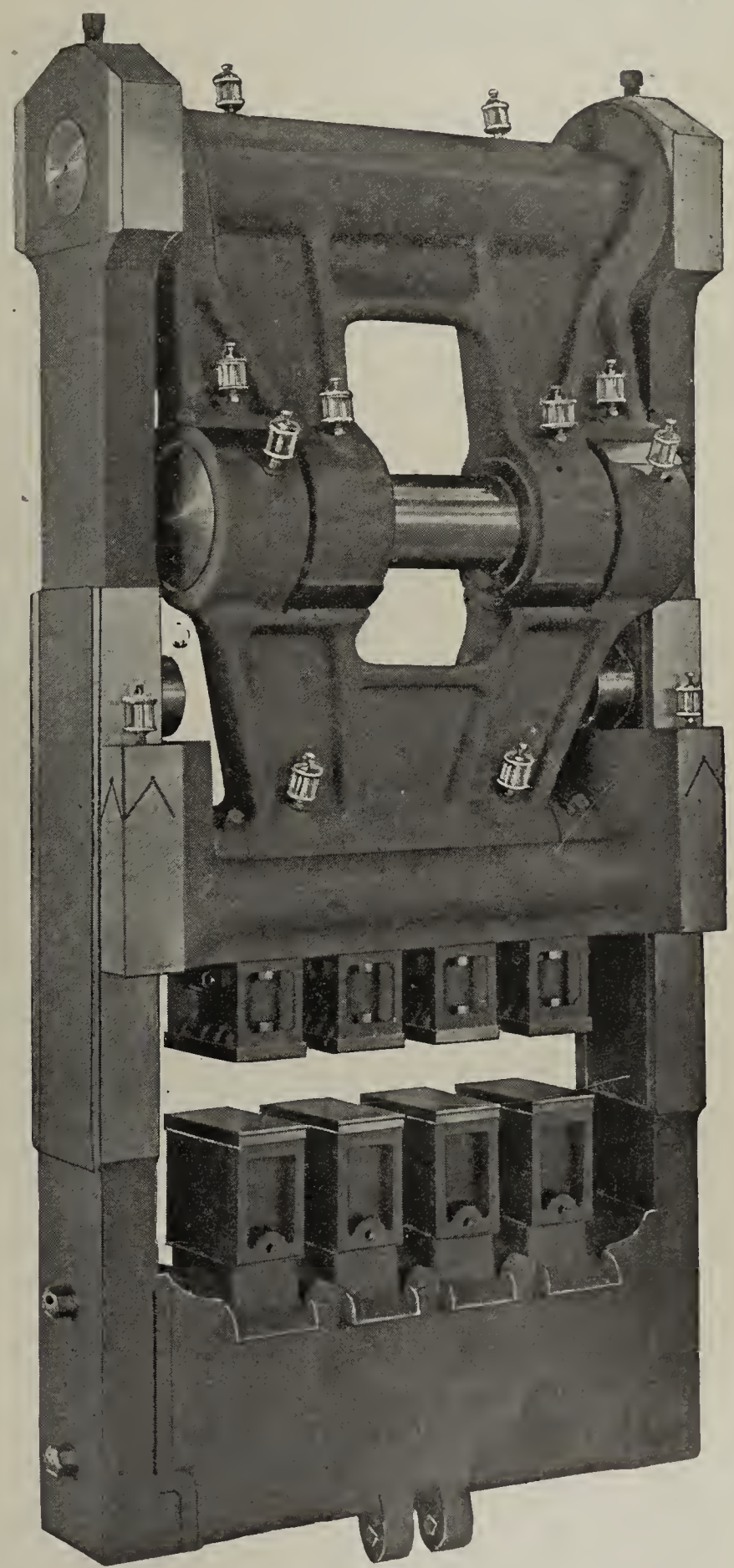
The symmetrical design of the Boyd Brick Press gives it the strength and beauty for which it has always been distinguished. The housing or stand, which contains the driving pulley and intermediate gears, is bolted to the main frame as shown. Each press rests on the floor line, is self-contained and does not need to be bolted or fastened to its foundation.

Noiseless.

No strain is exerted upon the side frames of the press. The movement of the Boyd Press is noiseless and without jar or shock. No buffers, air cushions, hooks, latches, or other uncertain mechanism are required or employed. There is nothing to get out of order. The mold liners are the same for and will fit each size press. They can be taken out and replaced, or ornomental molds set in without removing any of the working parts of the press.

No Pitman-Lever.

The Modern Boyd Press has no **Pitman-Lever,** though we have the only valid Patents on Pitman-Lever Presses. Eight and ten years ago we built Pitman-Lever Presses, but none since 1891, when it was superseded by the Improved Boyd. Nobody now wants a Pitman-Lever Brick Press, can't afford to use one. We will tell you why if you want to know. So could some of our first customers.



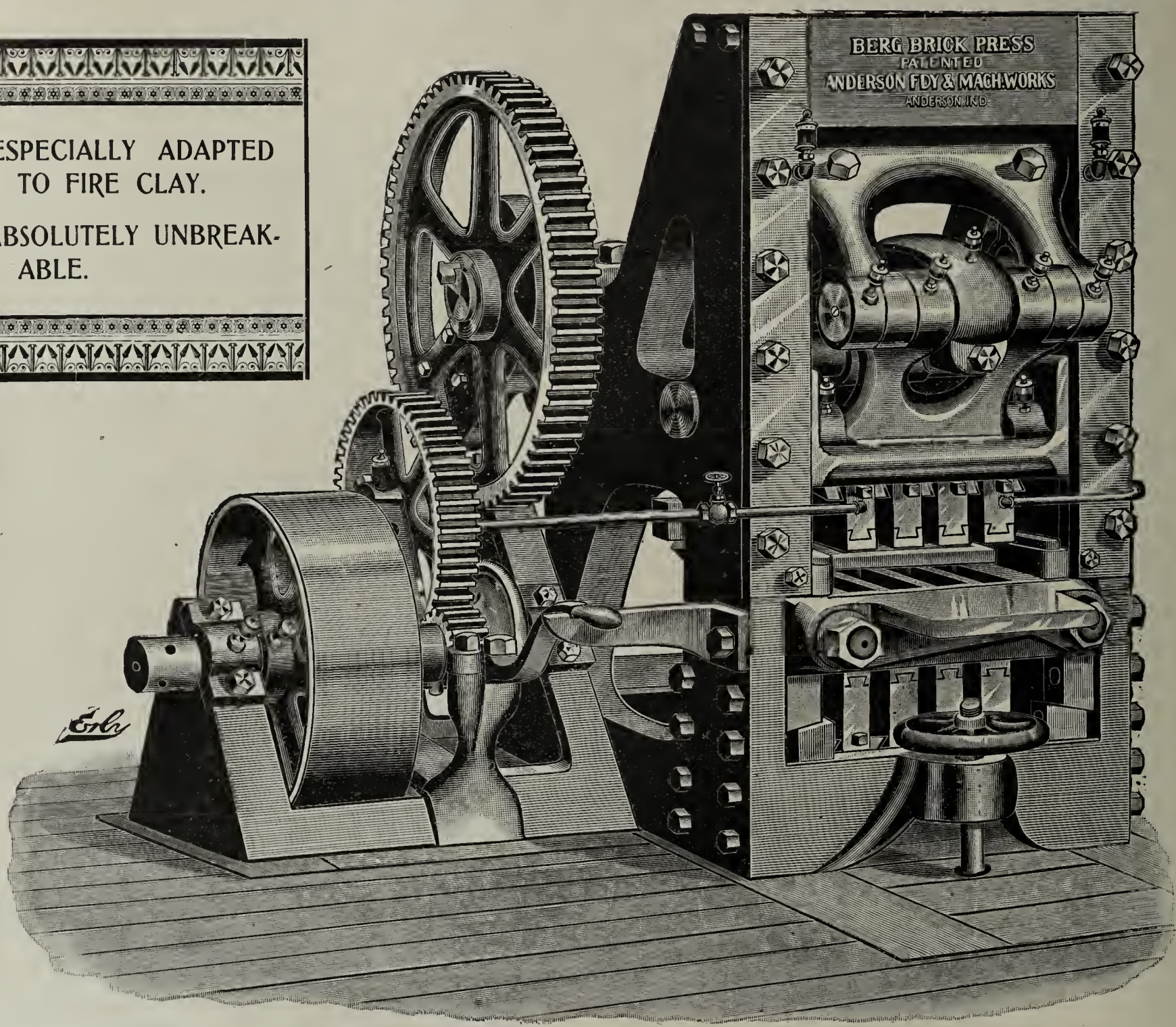
CHISHOLM, BOYD & WHITE COMPANY,

OFFICE AND WORKS: 57th and Wallace Streets. CHICAGO, U. S. A.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

"He that tooteth not his own horn
The same his horn shall not be tooted."

Therefore We Toot!!

OUR

Buckeye Kiln Brick

DRYER,

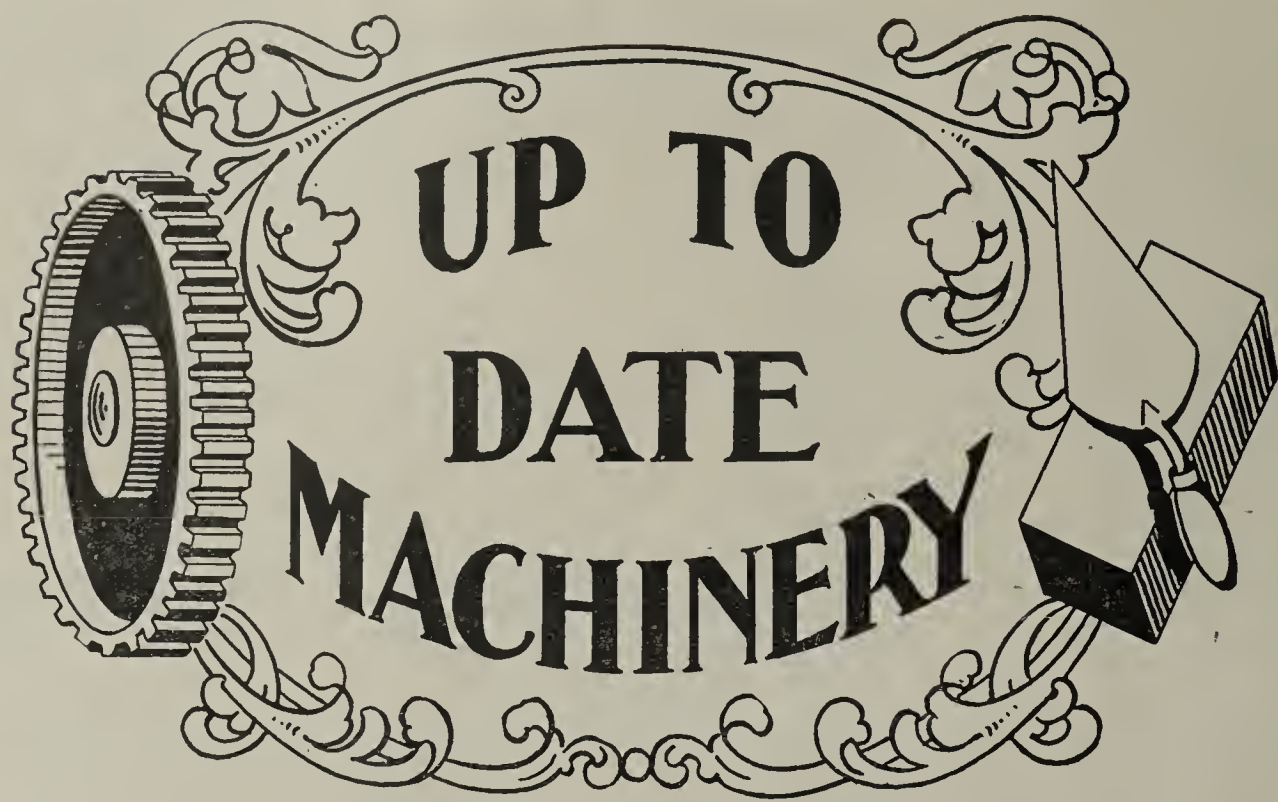
Is Drying AT ONE QUARTER the cost of

Steam Dryers.

No Gas, No Smoke,
No Repairs.

We Guarantee Results.

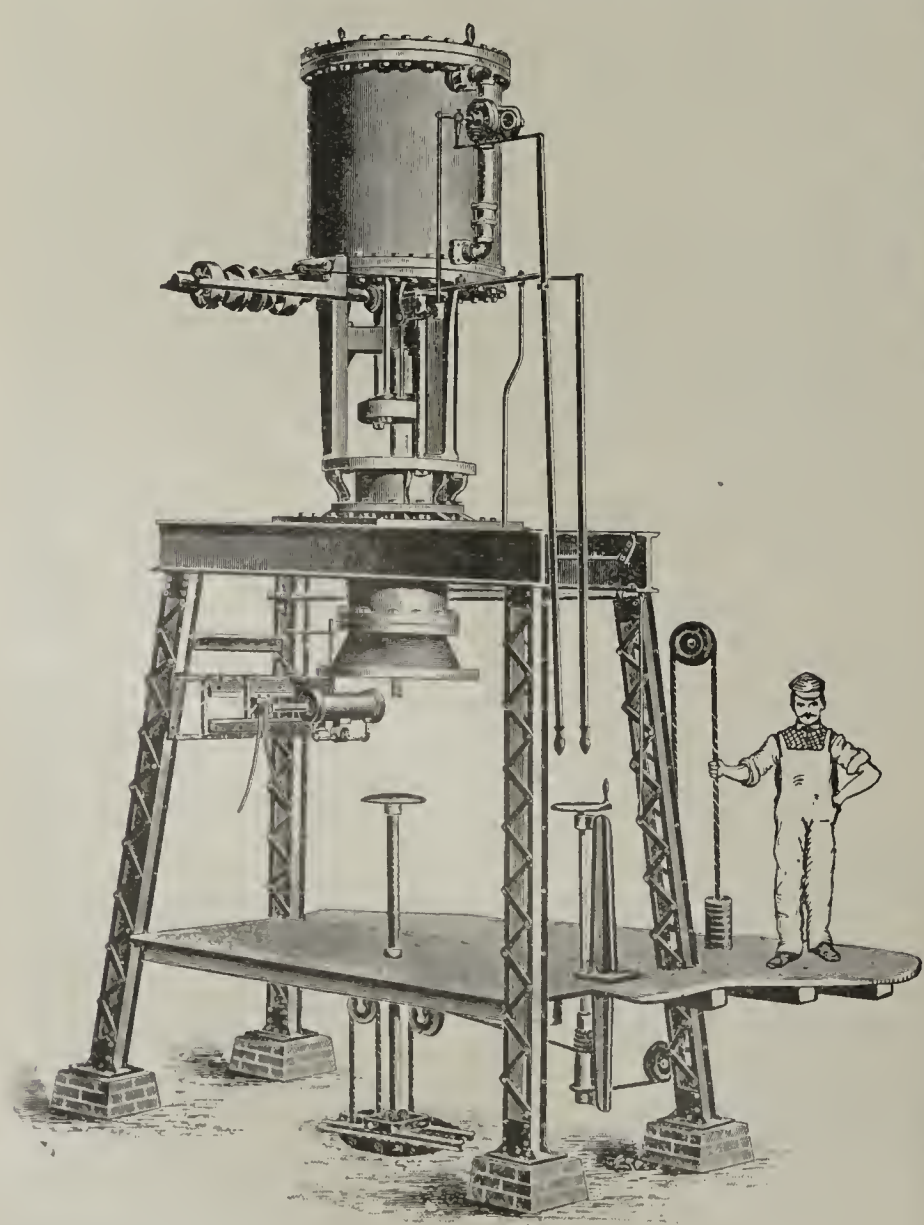
CLEVELAND CAR COMPANY,
CLEVELAND, OHIO.



When Buying New Machinery

Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front and Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.



Modern Clay Working Machinery.

We Furnish Complete Equipments for Sewer Pipe. Drain Tile and Fire Proofing Factories.
OUR DIES for Sewer Pipe, Drain Tile and Fire Proofing are Unequalled.

Steel Frame Dry and Wet Pans.

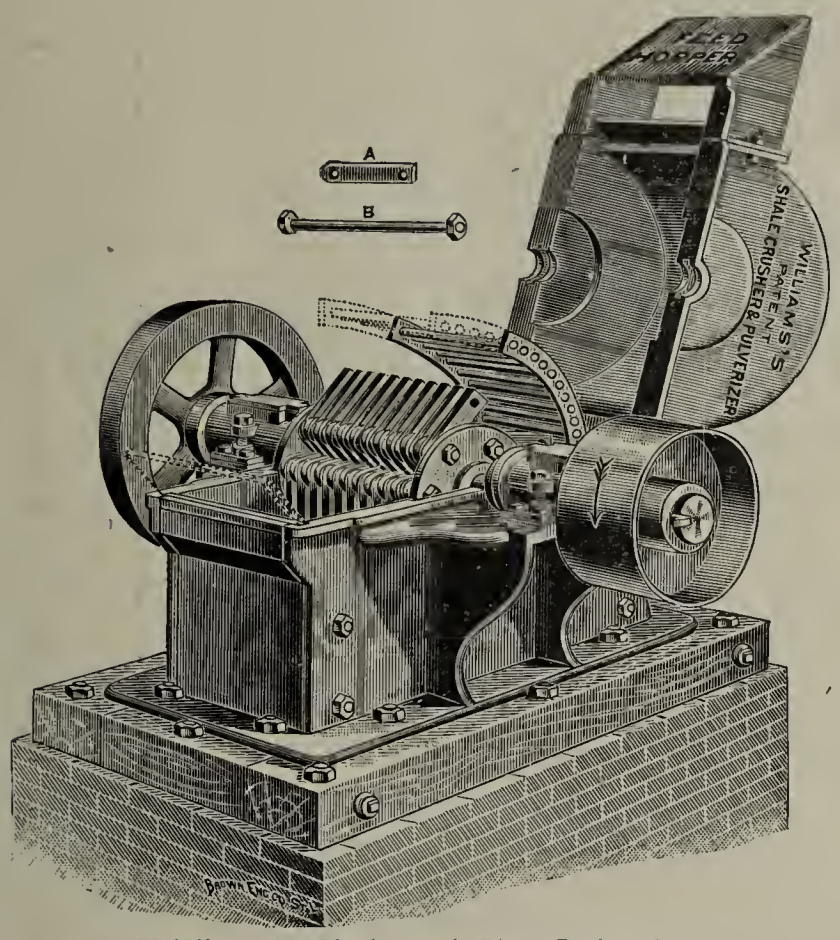
CATALOG ON APPLICATION.

TAPLIN, RICE & COMPANY,

Akron, Ohio.

The Williams Patent Crusher & Pulverizer Co.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

FOR FURTHER INFORMATION WRITE TO

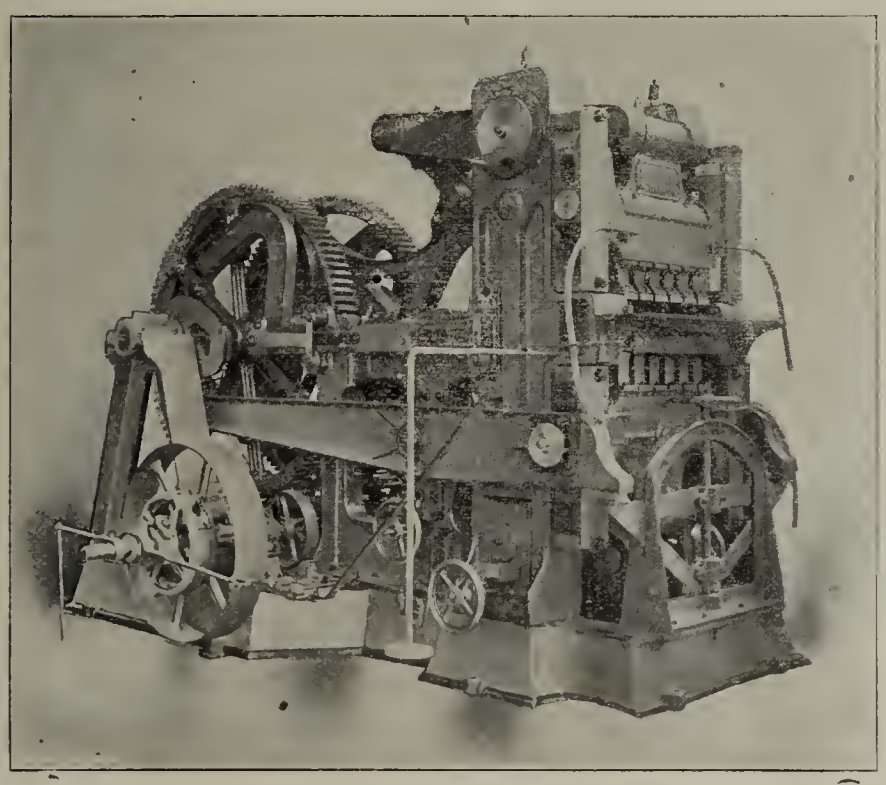
The Williams Patent Crusher and Pulverizer Company,

2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Washington Life Bldg.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for { STRENGTH, DURABILITY and SIMPLICITY.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market, requiring only 6 to 7 horse power to operate the largest 6-mold press. All parts subject to strain are made of the best bessemer steel, and can be seen and gotten at easily. The thickness of the brick can be changed and regulated without stopping the press, and every press is fitted with the Fernholtz mold Box, which is admitted to be the best in use. For fine pressed and ornamental brick, this machine cannot be equalled, the pressure on, and movement of the clay in the mold being such as to prevent granulation, and insures the most perfect product possible. We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer** in our own factory and guarantee them fully.

The opinion of those using our press and full information on application.

Dealers in BRICKYARD SUPPLIES.

The Fernholtz Brick Machinery Co.,

WESTERN UNION CODE USED:
CABLE ADDRESS "FERNBRICK."

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

The STANDARD BRICK DRIER,

May not be the ONLY good Drier on the market, but it is considerably better than the average good Drier.

For economy of Fuel and Labor, Range of Work and Capacity it is without a successful rival. It is easily regulated to meet the requirements of all kinds of clays, it is entirely free from complicated mechanical contrivances and requires no expert labor to operate it. It is SIMPLE, SAFE and SENSIBLE and it is NOT an experiment. It is SO good a Drier that you cannot afford to ignore it when it comes to the point of investing your money in a Drier.

OUR NEW CATALOG No. 50 Which we will be pleased to exchange for your Name and Address is full of information that will interest you. It tells concisely and plainly how THE STANDARD DRIER is constructed. how it operates, what it will dry, why it is economical and efficient, why it is the Drier that will most thoroughly satisfy you for all time and what its many users think of it. Write for a copy TO-DAY.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. XXXIII. INDIANAPOLIS, IND., MARCH, 1900. No. 3

Written for The Clay-Worker.

GOOD ROADS.

Ancient Roads of Stone—Modern Pavements of Brick.

BY GEORGE W. TILLSON, C. E.

THE EARLY HISTORY of roads and pavements is somewhat uncertain, and one must not expect exact dates, as the ancients did not have many facilities for recording facts, and road-making was considered of minor importance.

It is said that a little to the east of the great pyramid the remains of a stone causeway a mile in length have been discovered. This is supposed to be a portion of a road built by Pharoah for transporting material across the desert for the construction of the pyramids.

A few years later historians say there existed a grand boulevard two leagues long, well paved and lined both sides with temples, mausoleums, porticos, statues, etc., connecting Memphis with the pyramids. If these records are true these roads must have been constructed about 6,000 years ago, and were undoubtedly the first of their kind.

The Carthaginians are, however, generally given the credit of being the first road-builders. About 600 B. C., when the Romans invaded Africa in their enforcement of their famous edict, "Carthago delenda est," they quickly discerned the advantage of good roads for mobilizing troops, and upon their return home adopted a system of road-building which afterwards became famous, and their Appian Way, built about 300 B. C., can be seen at the present time.

The streets of Thebes and Jerusalem are said by historians to have been cleaned regularly, and were undoubtedly paved.

Brick Pavement on Ninth Ave. Between 13th and 14th Streets, New York City, after Eight Years Use.

It was a long time, however, before any regular system of pavements was adopted. Traffic was carried on with pack animals for a long time, in France, down even to the latter part of the sixteenth century.

Paris, which was the largest city of those times, laid its first pavement during the reign of Philip Augustus, about 1184, when its population was but little less than 200,000. The portions first improved were the square of the Chatelet, and the streets of St. Antoine, St. Jacques, St. Honore and St. Denis.

In the latter part of the sixteenth century Henry IV. appointed a "Great Waywarden of France," and this is probably one of the earliest appointments of an official to have a systematic supervision over public roads. It is stated, however, that as late as 1789 the country roads of France were generally in a state of nature or worse. A stone road was built from Paris to Orleans in 1556, the improved portion being fifteen feet wide.

The streets of Rome were paved in the fourth and fifth centuries after the founding of the city, while Cordova, Spain, is said to have had paved streets in 850. The stones in these old Roman pavements were polyangular in shape, from 12 to 14 inches deep, containing from 4 to 5 square feet of surface, and laid with close joints. More modern blocks were 7x3½x3½ inches. These were set on 12 inches of concrete.

The Strand, London, was ordered paved by Act of Parliament in the fourteenth century, although it is said that the first regular pavements were laid in 1533, when the city had a population approximately 150,000. These early pavements were undoubtedly of cobblestone, as it was not till 1761 that an Act of Parliament authorized the use of granite blocks for Westminster, and for London generally in 1776. Speaking of London, in 1685, Macauley's History of England says: "The pave-

ment was detestable; all foreigners cried shame upon it. The drainage was so bad that in rainy weather the gutters soon became torrents."

An engineer of London, in 1826, in a pamphlet issued on the pavement question, closes with: "However true it may be that an observant traveler cannot fail of being struck with admiration at the excellence of the turnpikes and other roads throughout this country he must at the same time be very much surprised at the badness of the carriage pavements, even of the principal streets of this metropolis." This was when London contained 1,400,000 people.

About this time the streets were improved by the well-known systems of Telford and Macadam. In 1839 the city contained 600,000 square yards of stone pavements, nearly all of which was macadam. In 1825 Telford recommended the use of rectangular stone blocks and in 1840 3x9-inch granite sets were used on Blackfriar's bridge, with cement mortar joints. In the same year a pavement consisting of broad, smooth, well-jointed blocks of granite for wheel tracks, with pitching between, was laid on Commercial Road.

In 1839 the city had 1,100 square yards of wood pavement, and this had increased to 60,000 in 1842. Its use was not continued, however, until improved methods of laying were adopted.

Asphalt was first used in 1869 on Threadneedle street. In 1873, 4¼ miles had been laid.

Concrete was introduced as a base for pavements in 1872, and was in general use in 1875, although tar and gravel had been used for filling the joints between stone blocks in 1869.

Manchester, however, should have the credit of first adopting this joint filler.

Glasgow first laid granite blocks in 1841, and Liverpool in 1871.

Recent explorations show that the streets of Pompeii were paved with Vesuvian lava, and some time previous to its destruction, as the blocks are considerably worn, despite the light traffic of those times.

The capital of Lithuania, a province of Poland, had stone pavements as early as 1655, and Porto Bello, Venezuela, in 1668.

Pavements of cut stone blocks have been discovered in the ruins of Palenque, Mexico.

Asphalt was probably first used as a road material on the highway between Bordeaux and Rouen, in 1840. This was a mixture of rock asphalt and common stone. In 1854 the Rue Bergere, Paris, was paved with compressed asphalt, followed by the Rue St. Honore in 1858, from which time the success of asphalt pavements in Paris has been assured. In 1685 a visitor reports that all the streets and avenues were paved with hard sandstone blocks, about 8x10 inches square.

In this country the first pavements were laid at about the same time, 1650 to 1660, in Boston and New York. In the former city, Washington and State streets were first improved, the material being the ubiquitous cobblestone. In New York a road used much by the brewers, called Brower street, was made so dusty by the passage of the heavy wagons, that the thrifty housewives made so much complaint about the injury to their curtains and carpets that the roadway was paved with cobblestones. This caused considerable excitement at the time, and people came from long distances to see the stone street, which in time came to be called Stone street, by which name it is known to-day.

A Swedish traveler, writing of New York in 1751, says: "The streets do not run so straight as those of Philadelphia, and have sometimes considerable bendings; however, they are very spacious and well built, and most of them are paved, except in high places, where it has been found useless."

Cobble continued to be the paving material till 1849, though some experiments were made with wood in 1839, but its use was not continued.

In 1849 Broadway was paved with the "Russ" block from the Battery to Franklin street. These blocks came from Staten Island, and were from two to three feet square and twelve inches deep. In 1855 these blocks were grooved on the grades to give a better foothold for horses. This pavement was replaced in 1869 by granite blocks under the Guidet patent.

Belgian blocks were first used on the Bowery, and for some years, and at that time were the improved pavements of the city.

In 1865 the Council of Hygiene and Public Health made a report in detail, in which it was stated that practically all the New York pavements were either cobble stone or Belgium blocks.

An experiment had been made with cast-iron blocks on Cortlandt street, a short time previous to this, and with Nicholson pavement in 1840, but without success. In this last mentioned year wood was laid in Philadelphia, Boston, London and New York, but lasted a very short time.

The present shaped granite blocks were first used about 1877, and that was practically the beginning of the systematic use of granite in the city.

Tar and gravel joints were first used by the dock department on Pier A, North river, in 1881, and a concrete base for granite was not adopted by the city until 1888. So it can be said that of what is considered the improved pavements of to-day none had been laid in any appreciable amount twelve years ago.

In the winter of 1888 and 1889 the Legislature of New York passed a bill authorizing the issue of bonds for repaving purposes in New York city. From this time dates the beginning of a systematic scheme to make the streets of New York compare favorably with the city in other respects. How well this has been carried out can be seen by reference to the last annual report of the Commissioner of Highways, in which it is shown that the pavements in the borough of Manhattan on Jan. 1, 1899, were:

	Miles.
Oblong granite	153.24
Oblong trap	41.38
Square granite and trap	39.03
Asphalt	149.35
Macadam and Telford	18.94
Vitrified brick	0.10
Cobblestone	1.10
Wood	0.08
Total	403.22

Just what this means can be seen by comparing it with the figures for 1890, when New York had:

	Miles.
Oblong granite	100.21
Oblong trap	67.39
Square granite and trap	157.57
Asphalt	3.36
Macadam	25.34
Cobblestone	5.13
Wood	0.03
Russ	0.12
Total	359.15

While the total amount of paved streets has increased but about fifty miles, the character of the pavement has very much improved. Only about one-fourth of the Belgian is left, and asphalt has generally taken its place.

In this brief sketch of New York pavements it will be seen that nearly all paving materials have been tried in her streets with the exception of brick. This material, coming into prominence about the time the city adopted granite and asphalt for its improved pavements, has not received much attention. At that time, too, brick had not been proven the success it has achieved to-day, especially in the larger cities.

About 1891, however, a small amount was laid on Ninth avenue, between Thirteenth and Fourteenth streets. It had a cement concrete base, and the joints were paved with pav-

ing cement, and bricks taken up after years of service showed how well they were filled. The work was done as an experiment, and has conclusively demonstrated what service good brick will give under adverse conditions. The pavement is laid in front of markets and commission houses, where heavy loads are handled, and where there is a great deal of twisting and turning. These bricks were called "Pyro-Granit," and were made in New Jersey under a special patent. It is claimed that by treating any clay with this process a good paving brick can be made of the product.

These bricks were of a peculiar size, 8½ inches long by 5½ inches deep by 2¾ inches thick. On some of them the name "Pyro-Granit" was stamped in raised letters, making a general depression about a quarter of an inch in depth. This weakened the brick somewhat, so that they scaled off from the top considerably more than those where letters were sunken. It is interesting to compare an analysis of these brick with that of the Metropolitan block, of Canton, O., which is conceded to be one of our best paving bricks:

	Silica.	Alumina.	Sesquioxide of iron.	Lime.	Magnesia	Absorption End Section in 24 hours.
Pyro-granit	73.03	22.45	2.94	0.25	Trace.	0.47
Metropolitan Block	63.74	22.86	8.81	0.65	1.82	1.82

It will be seen that the great difference is in the increased amount of silica and the loss of iron. Very few paving bricks contain more than 65 per cent. of silica, or so small a quantity of iron as this analysis shows. Is great merit may be due to these facts.

The accompanying cut was made from a picture taken Oct. 28, 1899. It will be noticed that, besides the elevated railroad on the street, there are also two lines of surface tracks in the center. This drives all traffic to the brick between the tracks and the curb. The cut shows the condition of the pavement after severe use for eight years, with practically no repairs. No one can examine this street as it is to-day without being satisfied that a pavement properly laid of such material is adapted to almost any traffic, and under ordinary conditions cannot fail to give satisfactory results.

Engineers are proverbially conservative. They do not wish to depart unnecessarily from precedent, and it is not to be wondered at that they have been slow to accept an artificial product until it has been proved in actual practice, especially when, as in this case, the material is so far away as is the paving brick clay of the Central West. When brick was first used in pavements the writer had very little confidence in its success. But the results obtained in the cities where it has been used must convince the most skeptical that brick has not only come to stay as a paving material, and that it has not only correctly solved the pavement problem in interior cities far from natural stone, but that it has proven itself to be the proper thing for all cities.

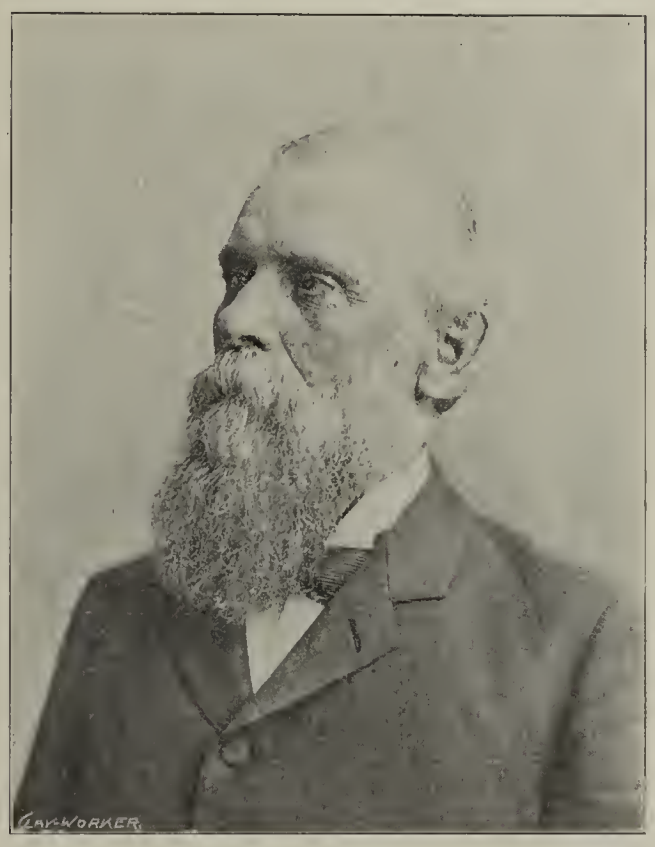
Many brickmakers are willing to place their product in competition with any material on streets of the heaviest traffic, and certainly some results will justify them. But in streets of moderate traffic, where the property owners wish a smooth, clean and durable pavement, it does seem to be just what is to be desired. The borough of Manhattan, New York city, is laid out with its great arteries of travel running north and south. It is crossed by streets sixty feet in width, with blocks two hundred feet wide, where the traffic is moderate. This would seem to be the ideal place for brick pavements. The action of the elements will be nil, they can be easily kept clean, they are sightly to the eye, the cost of repairs will be very slight, they maintain a smooth and even surface under wear, and their life will depend wholly upon the volume of the traffic. Granite blocks, as a rule, wear rough; asphalt, while smooth and pleasing, is acted upon by the climate and is expensive to maintain.

In the era of automobiles and rubber tires which is about to open up, and is bound to create a revolution in city traffic, whose magnitude no one can exactly predict at the present time, but which will certainly reduce the wear of all pavements to a minimum, it does seem as if first-class paving brick must take the leading position.

OBITUARY.

—George Tapper a Pioneer Builder of Chicago.—

In the death of George Tapper, Jan. 9, Chicago loses one of its pioneer builders. Associated with the building interests of Chicago since 1864, he could be called the Nestor of the trade. He was born May 29, 1835, in Devonshire, England. Following the trade of his father, at the age of seventeen he left England, coming to Chicago, and continuing in the building line until 1864, when he became a member of the firm of Mortimer, Loberg & Co. Mr. Loberg withdrawing in 1866, the partnership of Mortimer & Tapper was formed, and continued until recent years, when both retired from active business. Mr. Tapper was greatly interested in organizations pertaining to the building trades. Upon the organization of the Master Masons' Association, in 1880, he was one of the prime movers, holding the office of president during 1882 and 1883, and continued as a member until his death. He was a charter member of the Builders' and Traders' Exchange, organized in 1884, acting the first year as a director, and during 1887 and 1888 was president. He had unlimited experience in dealing with organized labor, and in a manner that meant justice to all interested. In January, 1887, the National Association of Builders of the United States was organized, and the first convention was held in Chicago March 29 following. At this convention Mr. Tapper was a delegate, representing the Builders' and Traders' Exchange of Chicago. In 1888 he was elected treasurer of the association, which office he held until February, 1899, when he was elected vice president. He was a member of the Builders' Club, was a thirty-second degree Mason, and during his business career in Chicago held numerous public offices of responsibility and trust. The Builders' Club, Builders' and Traders' Exchange and Chicago Masons' Association adopted fitting resolutions testifying to his worth as a man and citizen, and deploring his loss from the ranks of the progressive men of the community.



The Late George Tapper, Chicago.

Chicago, Feb. 12, 1900. VERITAS.

Written for THE CLAY-WORKER.

THE GARDEN CITY BRICK COMPANY.

—Pressed and Ornamental Brick Works Established by the Merchant Prince, A. T. Stewart.—

THE GARDEN CITY BRICK CO.'S brick works are located at Farmingdale, Long Island, N. Y., twenty-nine miles from New York city, on a tract of land containing 150 acres. This plant was originally started by the late A. T. Stewart, the great dry goods merchant. Since his death it has been improved and a stock company organized by his heirs, the stock being all held by them. There is an abundance of clay for various kinds of brick on the place. The clay for buff brick is obtained seven miles from here and shipped by cars run directly into the clay sheds.

There is a large shed for storing the clay. In this shed they have a large hot floor made of steam pipes for the purpose of drying the clay. The steam is furnished by two 50-horse power boilers. A 50-horse power engine runs the machinery. They use a dry pan, elevate the clay to the top of the press building, then over a gravity screen to the brick machine, a Boyd 6-mold dry press, on which they make 20,000 brick per day.

The brick are taken from the machine and placed on cars holding 517 brick each. One man removes the loaded cars to a five-track dryer, made by the Wolff Dryer Co. The dry brick are taken from the dryer in from 24 to 36 hours after being put in and set in the flood kilns, holding 150,000 brick each. They have four of these kilns, which are kept running the year round, one setting, one burning, one cooling and one drawing.

The finished brick are taken from the kiln, sorted as to shade and color, then sent to a pile for each shade. In shipping, the brick are carefully packed in straw to prevent chipping. For colors they use minerals and various clays, making every color from buff to black. The best selling colors are buff, gray, brown, chocolate, pink and red. They also make a mottled brick in red, buff and gray body. Their business has been steadily increasing each year, the market being New York city and Brooklyn. They also make a specialty of

GROUND ARCH WORK.

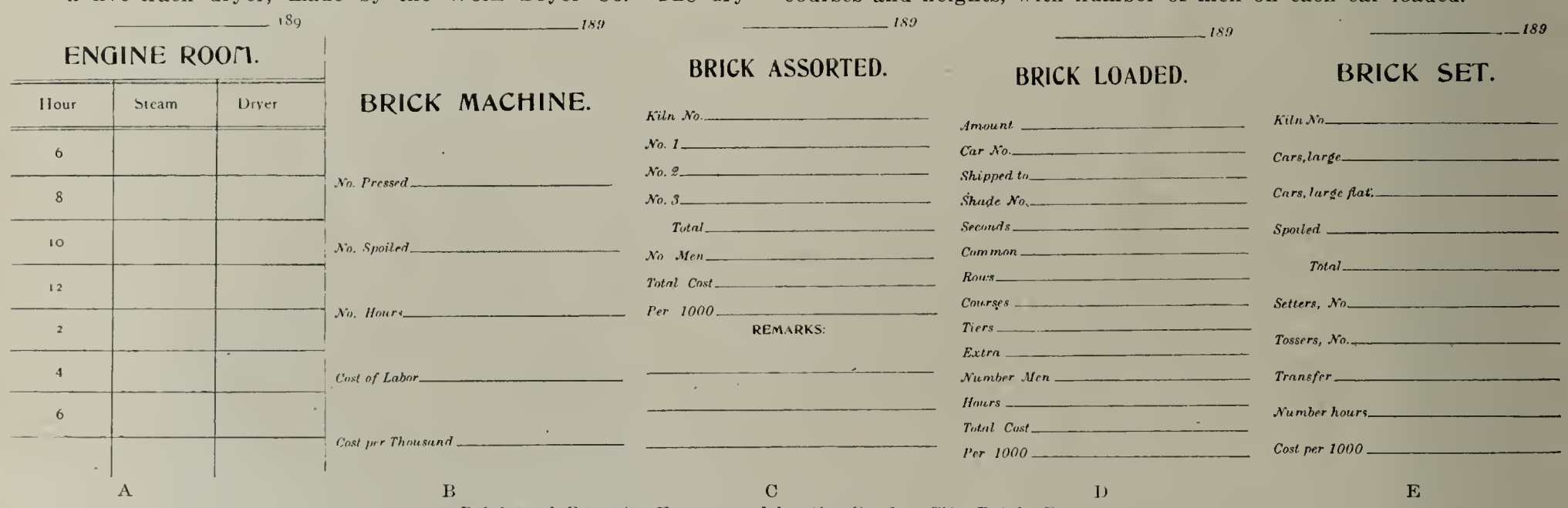
The builders furnish them a small sketch or give dimensions wanted. This is enlarged to a full sized drawing and a pattern made for each piece of brick to go into the arch. These patterns are given to a marker, who marks each brick. Next they go to a chipper, who chips each brick as close to the line as possible. They are then taken by the grinder, who finishes the brick. The finished product is then carefully looked over, each piece tried with a square and compared with the pattern. If it is perfect it is passed and the number of its position in the arch marked on it. This work is done by one man, to insure perfect work. Not an imperfect brick is allowed to go out. The arches are then packed in barrels, one or two arches in each barrel, and each barrel stamped with size of arch and the number, so the builder can get any arch he may want. A full sized drawing is sent with each different style of arch.

ROCK FACE BRICK.

This company does a large business in this line of goods and has a reputation for fine work. They are very careful to make a full, round rock, not the old style flat rock. The difference in appearance when placed in a building is very marked.

They have a system of checking up all the departments, which is described as follows: The night engineer gives an account of the temperature in the dryer; also amount of steam in the boiler (see blank A). The transfer man who takes the dry brick writes out reports on the back of his slip, the temperature of dryer at 6 a. m., 12 m. and 6:30 p. m., so they have a check here. The machine foreman reports on his slip the number of brick pressed (see blank B) each day. The transfer man reports the number of damaged brick returned from the setter, which shows on machine slip. This shows the actual loss from machine to kiln. The foreman of brick sheds reports on his slip (see blank C) amount of brick drawn from kiln each grade, together with all broken and soft brick. This gives the loss of brick through the kiln. The shed foreman also reports each car of brick loaded (see blank D) in tiers, courses and heights, with number of men on each car loaded. This verifies the count and also gives cost of loading. The setters report number of cars of brick set each day (see blank E). The foreman of the clay bank reports number of loads hauled to shed, also loads of topping removed, together with number of horses and men, in hours. This gives cost of placing clay in shed. So long as the different tallies of the different departments are satisfactory there are no questions asked, but if anything is wrong it is investigated at once. They find very little difficulty in the above method. The burners are also checked up each twelve hours in a similar manner.

The works have been under the direction of T. C. Lundy for a number of years, and he has proven himself the right man in the right place. He is an old time member of the N. B. M. A. He contributed a valuable paper at the Detroit convention and exhibited some of the Garden City Company's mottled and flashed brick that challenged the admiration of all, and members of the National Association know a good brick when they see it.



_____ 189

ENGINE ROOM.

Hour	Steam	Dryer
6		
8		
10		
12		
2		
4		
6		

A

_____ 189

BRICK MACHINE.

No. Pressed _____

No. Spoiled _____

No. Hours _____

Cost of Labor _____

Cost per Thousand _____

B

_____ 189

BRICK ASSORTED.

Kiln No. _____
No. 1 _____
No. 2 _____
No. 3 _____
Total _____
No Men _____
Total Cost _____
Per 1000 _____

REMARKS:

C

_____ 189

BRICK LOADED.

Amount _____
Car No. _____
Shipped to _____
Shade No. _____
Seconds _____
Common _____
Rows _____
Courses _____
Tiers _____
Extra _____
Number Men _____
Hours _____
Total Cost _____
Per 1000 _____

D

_____ 189

BRICK SET.

Kiln No _____
Cars, large _____
Cars, large flat _____
Spoiled _____
Total _____
Setters, No _____
Tossers, No. _____
Transfer _____
Number hours _____
Cost per 1000 _____

E

Brickyard Reports—Forms used by the Garden City Brick Co.

RIGHTS AND LEFTS.

There is always a right time, a right way and a right man for everything—absolutely everything. The wrong fellows—the "lefts"—may be industrious, earnest and brainy to a degree, but they must invariably stand aside when the right fellow appears, for he is the one man in all the world for that particular undertaking.—Ex.

Written for The Clay-Worker.

SOME COSTLY BITS OF EXPERIENCE.—No. 2.

By L. C. Moore.

SOMETIMES THESE experiences that cost us so dearly are forced upon us by circumstances that almost compel us to pass through them. But the mistakes we make do not occur because we follow the drift of circumstances, but because we do not use good judgment in selecting the proper route through the difficulties. Luck sometimes favors a man, but her chart is too uncertain to be a guide upon which one may depend. Good, sound judgment, coupled with whatever one may be able to learn by study upon his chosen avocation, is the only guide for one who is forced to proceed over unknown ground. This ground may be well known to others, but if they left no chart to guide the future traveler it becomes an unknown wilderness to you and me. When we meet with problems that appear new to us it is often that a little study will disclose such resemblances to some former experiences that we find we are much better acquainted with the subject matter in hand than we had at first supposed. There is an old proverb that there is nothing new under the sun. And much that puzzles us, and over which we often make great blunders, is really, when properly analyzed, only a different form of some old acquaintance. We had some trouble laying extra hard bricks in the wall from the fact that the mortar was so slow in hardening that the weight of the upper part of the wall would crush the mortar in the lower joints and cause the bricks to slip, and the wall would twist out of shape. We had learned to look out for this difficulty, and give time for the moisture to leave the mortar sufficiently for the brick and lime to cement together before enough weight was put upon it to crush the mortar joints. We are strong believers in hard bricks, and since building our Eudaly kilns have always a good supply on hands. But we often have to proceed more slowly with our work in order that the mortar may have time to "set."

But the most costly bit of experience that ever befell us was right in the same line with this difficulty, and we never recognized the similarity until the mischief was done and paid for. We have a great faculty for having a better view of matters past than those of the future, but perhaps we are not alone in this predicament.

A few years ago, during the month of February, we contracted to erect a large brick building, with basement, to be used as a wagon factory. Our customer was in great haste to have the building completed, as he wished to commence operations in April, and any delay in its completion meant considerable loss to him. We aimed to accommodate him as well as we could, and commenced the work in spite of rain, sleet and snow. The excavation for the basement was made, the foundation was started, and soon the walls of the basement were built up to the height of several feet.

But the rains continued, the bricks were all wet before they were laid in the wall, and many of them were covered with sleet. The mortar joints would not harden, and, to make matters worse, the earth next to the walls became thoroughly soaked and took a slide against the green walls. The walls began to slip in places and to lean in others from the weight against them, until we were forced to tear out most that we had done and build heavier walls. Still the rains continued, with an occasional freeze at night, and the bricks which went into the new walls were either wet or filled with frost. The masons pushed the work as rapidly as possible under the circumstances, but when they were forced to stop on account of bad weather the time counted for nothing so far as drying out that wall was concerned. The new walls, though much thicker than we had ever before used in such a building, soon began to show signs of leaning. We propped them and voted to call a halt until the weather settled, that we might safely proceed with the work. But the owner of the building urged us forward, saying it would ruin his business if he could not move into the building by April. We consulted our mason in regard to the advisability of proceeding further during the rainy season. We supposed he knew something about his business, and as the matter was something new to us we proceeded to take his advice. He claimed that, when the walls were built up higher and more weight was placed upon the basement walls, they would stand more firmly and be less likely to give way from the pressure of the earth from the outside.

A Glimpse of the Works of the Garden City Brick Co., Farmingdale, L. I.

We let the work go on, although the weather was still as unfavorable as at the first. About the time the basement was completed there came very severe cold weather, freezing the walls hard, so that for the time being they were in no danger of falling. We placed the joists for the first floor in position and waited for warmer weather. We did not have long to remain in idleness, for an early spring set in and treated us to about two weeks of ideal weather for doing brick work. We put on an extra force and completed that building as rapidly as possible. The roof was on and all of the woodwork done in a very short space of time. The building was inspected and received, and the owner had started to move in, when one morning, after a night of hard rain, there came a crash that wakened one end of our town by its great noise. One side of this building had collapsed. From basement to roof it was in ruins. We had completed our work and the building had been accepted, but we had not received all of our pay for its construction. Of course, whether justly or not, we had to bear the blame, and an attempt on our part to collect the amount still due threatened to provoke a lawsuit.

At last we compromised at considerable loss to us, but we thought anything in reason was better than going to law.

And now as to the cause of the disaster. The work had been as carefully done as could be, and first-class lime and brick were used in the construction of that wall. But the mortar in the basement had not set or hardened, and, after the fall of the wall, was as soft as if the work had been done but a day. That hard freeze had saved the walls for a time, and the upper walls had been erected while the basement walls were still frozen. But when the thaw came the mortar was still soft, and the weight of the superstructure, instead of holding the lower walls more firmly, actually crushed the mortar joints and forced the wall to give way. There could be no bond between a wet or frozen brick and the lime mortar, and the walls were really weaker than one would have been laid up without any mortar.

We have since used cement in basements and foundations under similar circumstances, and had good success. But the safest plan is to let your customer wait until favorable weather for brick work, and then one can proceed with no fear of failure. Our former experience with hard brick should have been sufficient for us not to have gone through with this one. But we never thought to connect the two troubles to a common source until too late. When that freeze came the trouble ceased, and we thought that the wall had hardened from drying, and not until the thaw and the crash did we learn the full extent of our mistake.

(To be continued.)

KILN ECONOMY.

Editor THE CLAY-WORKER:

Inclosed you will find $2.00 for The Clay-Worker another year. The Clay-Worker is all right, and I expect to stay with it as long as I make brick.

I have been reading Mr. "L. C. M.'s" letters closely, and I am of the opinion that he is onto something pretty good in kiln building. In this vicinity one can save about 25 cents a thousand in fuel and also about 25 cents per thousand in labor by burning with coal.

Messrs. Martin & Hughes, of this place, have one downdraft kiln, and they move their brick out and stack them under sheds to make room for another kiln. This makes extra room, and I doubt if there is much saved by it, as it is worth about 25 cents a thousand to empty a kiln. Unless one has two or more patent kilns to burn in, so that they could empty one while filling another, I don't think there would be much saved over the old style of burning with wood. Wishing you success, I am, Sincerely, J. H. HORNER.

BUTTON-HOLE TALKS.

"HELLO, GATES, let me look at your hat a minute." Taking my hat, he turned up the lining and began taking out the pads with which it was most plentifully supplied, muttering the while, musingly, "I knew it, I knew it—knew you had to have it stretched after the way they treated you at Detroit. Must have had it stretched a dozen times or so. Only wonder is that they didn't turn your head as well as swell it. Maybe they did, too. Too much kindness is just awfully dangerous to 'think tanks.' Why, when they sprung that nomination on you I could just see your head swell, and when the session was over you didn't dare try on your own hat, but sneaked Fiske's and then pretended it was a mistake. Showed some judgment there, anyway; those down-East Yankees have to use good-sized hats to bandage their idea bunches with.

"What I have been worrying about, though, is as to how the reaction would set in with you, and as to whether your head would get back to normal or not. Terribly painful operation is this shrinking, though, but it has to come, and the only way is to keep putting in the pads as the swelling goes down, and to try to stay on the earth with the ordinary mortals, and act like an ordinary, everyday mortal, too.

"The way you walked into their trap, too, was a caution to innocents. Let them lead you right up in front to the slaughter, and then keep you there. You might have known Eudaly was not so awfully interesting all for no purpose. I really believe if it hadn't been for that wonderfully cute and witty welcome from his Honor, the Mayor, you would have been a complete flunk.

"Well, you are the President of a grand, good organization, and, when you get to be an ex-President, you will be one of a talented assemblage of men. The boys seemed really glad to put you there, Gates, and no one will quarrel if your head did swell a lot, for it is not every one who has so good a lot of friends, and to whom friends and opportunity come together.

"Just come down to earth as lightly as possible, take out the swelling and put in the pads gradually, and come to yourself and your own as best you can.

"The swelling isn't so awfully dangerous. Any one is liable to sudden attacks on occasion, but it must be taken out soon. If it remains it is fatal. So it is not the swelling, but the remaining swelled, that does the damage." GATES.

The Garden City Company's Clay Banks and Clay Diggers.

Written for THE CLAY-WORKER.

MODERN AMERICAN FRONT BRICK. No. 25.

—Physical Tests of the Burned Ware.—

IN THE LAST article we paid some attention to the determination of the melting and vitrification temperatures, and the question now arises, What is vitrification, and what is the proper degree of vitrification for a given clay and a given purpose? We know that watersmoking is the first stage of the process of burning. Its office is to expel all the mechanical water which is still present within the pores of the ware after drying, and which persistently clings to the clay. Only after this has taken place can the clay be considered perfectly dry and is it allowable to raise the heat over 400 degrees Fahrenheit or thereabouts. But as now the heat rises the chemical water begins to be driven off, and, at a bright red heat, has been completely expelled. Evidently, now, in addition to the pores from which the mechanical water has been expelled, there are added the pores just vacated by the chemical water of combination. Hence at this stage there is maximum pore space or maximum porosity. On taking out of the kiln a brick from which the water of combination has just been driven off it will be found to absorb water eagerly, more so than at any other stage, which proves the fact stated. But after the dehydration period, with the rising temperature another change begins to take place, which is due to a variety of reactions, and the tendency from now on is for the density of the ware to be increased. When the temperature has been reached at which for a given clay the fluxes, present in larger or smaller quantities, begin to exert their action and tend to draw together the particles of clay, the particles are about to lose their identity, so to speak, and are eliminating the pore space according to the degree of fluxing action, which, of course, again varies with the temperature. Thus, as the heat is being raised there will be a point at which the particles touch each other, and the ware shows no porosity. This point is that of complete vitrification. This would, indeed, be the ideal condition of a perfect front brick, as far as its use is concerned, and the nearer we come to complete vitrification the nearer we come to the ideal brick. A brick of this character would not absorb any water, and hence the absorption of water may be considered a test of vitrification. The less water a brick absorbs the more thoroughly it is vitrified.

But there are some drawbacks to this condition, and these are the liability of the clay to lose its shape by virtue of the beginning of softening and the brittleness caused by the approach to the glassy structure. For this reason we often must be satisfied with approximate or incipient vitrification. A paving brick absorbing no water would be too brittle for its best showing. Hence vitrification should be carried only so high as to obtain the proper combination of density and toughness necessary for paving brick, sacrificing a little of each.

In order to determine the proper point of vitrification for an unknown clay to be used for paving brick strictly practical tests must be applied, and the procedure should be about as follows: The clay should be made up into a thoroughly worked batch sufficient for making six hundred brick under exactly the same conditions. The brick should be dried carefully and then divided into, say, six piles of a hundred each. Each patch of brick should be set in the kiln by itself, but one near the top, one just below it, and so on almost to the floor of the kiln. Each set of brick should likewise be supplied with a number of pyrometric cones; the top one, in the case of a red-burning clay, should have No. 4; the next lower one, No. 3; the next, No. 2; then 1, 01 and 02. The cones should be protected from the direct touch of the flame by setting brick over them. Since these sets represent six different temperatures, being set in vertical line, each will possess a certain degree of porosity differing from the others more or less, the one showing maximum vitrification for this burn being evidently on top, the one of least vitrification near the bottom. After slow cooling each set should be tested in the modified Talbot rattler. The batch standing the best test must certainly represent the best brick of the lot and should be adopted as the standard. The temperature at which it was burned should now be recognized as the standard temperature and every effort be made to attain this heat throughout the kiln as much as possible. Of course, if in burning it was found on first trial that the cones represented a higher or lower scale of temperature than the clay required, the cone series should be started with a higher or lower number, as the case requires. Absorption tests should now be made with brick of the best set and this absorption recognized as the standard condition, since it indicates clearly the proper degree of vitrification. For a given clay whose characteristics have been defined by practical tests the absorption test is a

Kiln Sheds, Machine House and Workmen of the Garden City Brick Co.

very valuable help, although it is not applicable as a general test for all kinds of clays. This is evident from the fact that the practical degree of vitrification differs for every clay, and that the density obtained by vitrification is modified by the danger of brittleness. But once the absorption is determined for a certain clay and the proper degree of vitrification, it becomes an aid not to be despised in judging the grade of ware coming from the kiln, especially since it is so easily carried out. For instance, if for a given clay to be used for paving brick the degree of vitrification of the best grade of brick was found to correspond to 5 per cent. absorption, any absorption below this figure would indicate overburned, above it underburned, ware. Of course, uniformity of manufacture is assumed in the above statements. Fine grinding tends to increase the density and hence to lower the absorption, while coarse grinding does the reverse.

For face brick brittleness is not so much of a factor as in paving brick, but the danger of deformation upon vitrification must be duly considered, and this sets a sharp limit to the extent to which vitrification may be carried.

—Methods of Physical Tests.—

According to the outline of topics made in the March CLAY-WORKER, 1899, we are now to consider the physical testing of the burned clay products, and we shall take them up in the following order:

Density and specific gravity.
Frost resistance.
Wearing power.
Hardness.
Crushing strength.
Cross-breaking strength.

We shall not discuss these topics at length, nor go into them minutely, since to a large extent they belong to the realm of the engineer, and for a thorough treatment the application of mathematics and physics would be necessary. However, it will be profitable to look at the subject from the standpoint of the clayworker.

—Density.—

The general effect of maximum density has been sufficiently brought out in the discussion of its equivalent, complete vitrification. It is evident that when a brick is completely vitrified it has minimum pore space, and hence maximum density. From this it follows that in determining the porosity of a brick we obtain an expression for its density, since a perfectly dense brick has zero porosity. For a piece of clayware having a volume of one hundred cubic inches and absorbing ten cubic inches of water the porosity may be said to be ten-hundredths, or one-tenth, which, of course, is equal to 10 per cent. Evidently this is an expression showing the density of this particular piece of clay, density being inversely proportional to the porosity. As commonly understood, the terms density and porosity are not correct from the scientific standpoint. The density of a body, defined accurately, is the weight of unit volume (unit volume may be the cubic inch, the cubic centimeter or any other unit, preferably the metric unit) divided by the specific gravity. According to this, the density will be the greater the nearer the quotient of this expression approaches unity. Similarly, the porosity will be equal to 1, minus the fraction obtained by dividing the weight of unit volume by the specific gravity of the body.

But for general practical purposes the apparent density and porosity will be found sufficiently accurate, and even these may be reduced to an approximate, very simple determination. In finding the porosity of a piece of burned clayware it is only necessary to submerge it in clean water after having thoroughly dried and weighed it. The amount of water absorbed may be expressed in terms of the volume or the weight; the first practice is the more rational one, but the second is used most frequently. An example will make the work perfectly clear: Suppose a brick has a volume of eighty cubic inches, which is easily calculated from its measurement, and weighs five pounds, or eighty ounces. On being dried and submerged in water for one hundred hours it is found to weigh eighty-eight ounces, showing an increase in weight of eight ounces. On the basis of weight the absorption would therefore be 10 per cent. But when referred to volume the matter is a little different. It is known that an ounce of water is equal to 1.73 cubic inches in volume, and hence eight ounces would correspond to 13.84 cubic inches of water. Since the volume of the brick, as obtained from measurements, is eighty cubic inches and the volume of the water absorbed is 13.84 cubic inches, the per cent. of pore space will be 13.84 divided by 80, multiplied by 100, or 17.3. It will be readily seen that the absorption, when referred to the volume of the test piece, represents the true state of conditions, since the water absorbed occupies the pore space of the ware. It is often advantageous to make these tests with smaller pieces, which do not require so much time for soaking. For this purpose graduated glass cylinders can be had showing cubic inches, and which are filled with water up to a mark, usually the zero point. A piece of burned clayware large enough to go into the cylinder is dried, weighed and placed under water in any kind of a vessel. When saturated with water it is weighed again and then thrown into the cylinder with the water level at zero. Of course, the level will now rise and indicate the volume of water displaced, which is equal to the volume of the piece of clay. Knowing now the weight of water absorbed, from which the volume of water can be easily calculated, as shown above, and the volume of the test piece, the per cent. of volume of water absorbed is readily obtained. This method is quite rapid and very satisfactory. It certainly deserves more recognition for many

A Gang of Garden City Brick Co's "Rockers" chipping off the face of Press Brick.

purposes than it is getting at present. The precautions to be observed during the test are that the test piece must be dried at 212 degrees F. before submerging, and that before weighing, after absorption, the excess of water on the surface must be rapidly absorbed with a little absorbing cotton. When a whole brick is used for the test it should be kept under water at least 100 hours, but 150 is to be preferred. For small pieces, used in connection with the measuring cylinder, five hours are usually sufficient. It is essential that the length of absorption be the same for every test.

—Specific Gravity.—

To know the specific gravity of a burned clay, or to compare the former at different degrees of burning, is a very useful and interesting matter, but in order to obtain these data it is necessary to make physical observations which require a certain degree of accuracy, and the final result, after all, does not tell much more than the absorption test. By specific gravity is meant the comparison of the weight of a certain volume of a substance with the weight of the same volume of water. For instance, if five cubic inches of a piece of burned clay is found to weigh 8.6 ounces, and knowing that five cubic inches of water weigh 2.88 ounces, the ratio between the two weights is 3 to 1, or, in other words, the clay weighs three times as much as the water, taking equal volumes of each, and hence the specific gravity of the burned clay is 3.

The method of procedure for determining the specific gravity is as follows:

Pulverize the burned clay so that it will go through an eighty-mesh sieve, and weigh out as accurately as possible a certain amount of the powdered clay, say two ounces. Now take a glass cylinder, graduated in cubic inches and fractions of the same, and fill it up to the zero mark with water. Brush into the cylinder the weighed amount of the clay powder, let stand for some ten minutes and read off the increase in volume due to the volume of the clay. Now divide the number of cubic inches of increase by 1.73 (volume in cubic inches of one ounce of water), which will give the weight of a volume of water equal to the volume of the clay taken. The weight of the clay, divided by the weight of the water, will give the specific gravity of the clay.

But, as has been said before, for practical use the clay-worker will not have to deal much with the specific gravity of burned clay, since the absorption test will suffice for most purposes.

Written for The Clay-Worker.

KAOLIN—ITS COMPOSITION AND USE—PECULIAR METHODS OF GATHERING AND PREPARING IT FOR MARKET.

THE TERM KAOLIN is usually applied to those deposits of white-burning clays which are found at the point where they have been formed. Such deposits arise from the decomposition of feldspar veins, and consequently the kaolin deposit has the same form as the vein from which it originated. It may therefore be narrow, but of considerable depth, the actual depth of the clay being governed by the limit to which the feldspar is decomposed. In some regions this is as little as sixty feet, while at other places in the United States it is known to reach a depth of 120 feet. Kaolin proper possesses very little plasticity, but there are many deposits of white clay in the far South, that are sometimes erroneously called kaolin, which are highly plastic in their nature. Such deposits are not true kaolins, but have probably been derived from them by the washing down of the original kaolin mass into the sea, where a re-deposition under water has taken place. These white-burning sedimentary clays differ from the kaolin deposits in being often of considerable extent—that is, they are not confined between two walls of foreign material. Furthermore, they are not, as a rule, as deep as the true kaolin deposit.

Kaolin of good quality is pure white when washed and dried, but it is a gray color when wet. When little iron is present kaolin burns to a white body, whose hardness and density vary with the degree of the temperature to which it is subjected, and also with the mineralogical composition, for a kaolin, in addition to the clay base or clay substance called kaolinite, usually contains an appreciable quantity of quartz, feldspar and mica fragments, many of them very minute. The effect of this foreign matter is not only to decrease the plasticity, but also to decrease the shrinkage of the kaolin in burning, and those kaolins which do not contain sufficient quartz naturally usually have to have some added to them in the process of manufacture.

Kaolins are usually mined by one of two methods, viz., by sinking pits or by hydraulic mining, the former being necessary in the case of dense, fine-grained kaolins, and the latter applicable in the case of coarse-grained, sandy ones.

In the pit method it is commonly customary to sink a circular pit about twenty-five feet in diameter into the clay to its greatest depth, this shaft being lined with temporary crib work of wood as the work proceeds. The soft clay is dug by means of picks and shovels and loaded into baskets and hoisted to the surface, whence it is sent to the washing plant.

In the second method, that of hydraulic mining, the custom usually followed is to flood the kaolin pit with water to the depth of several feet. A suction pipe is then lowered into the pit, almost to the bottom, and right next to it is placed a rotary scraper to loosen the clay. The loosened clay, sand and water are sucked up through the pipe (this is usually about five inches in diameter) and discharged into the washing troughs. The latter method is the economical as well as rapid one, where the nature of the clay permits its installment, but most clays are too dense to allow its being used.

No kaolins thus far found in this country have been in the proper condition to permit their immediate shipment to market. On the contrary, they all have to be washed in order to separate particles of mineral matter, which carry iron oxide, and also to clear the clay from coarse grains of quartz, mica and other minerals, this washing being usually done in troughs. The kaolin and sandy matter are discharged into the upper end of the trough, together with the stream of water, and then carried along several hundred feet of the troughing to the settling tank. As the suspended mass passes along these troughs the sand and other heavy particles are quickly dropped by the slow current, while the finer particles of clay remain suspended and pass on to the settling tanks, where they are accumulated. After the clay has collected in the settling tank to sufficient depth, the slip, as it is called, is pumped into large filter presses, and nearly all of the water squeezed out of the clay. The cakes of kaolin after being taken from the press, are set on racks for further drying, and are then shipped to the markets.

The cost of washing kaolin varies largely, and depends on the nature of the material—that is, the density of the clay and the presence of coarse grains, and also the amount of fine sand which it contains. As a rule, the washed product does not amount to more than 30 to 35 per cent. of the total amount mined, the other 65 per cent. being the sand which is separated in washing. The finer the product required the smaller the yield per ton mined. Kaolin is used largely for the manufacture of chinaware and paper. That used for the paper purposes must be very white in color, and consequently it can carry but a small per cent. of iron oxide; but the per cent. of silica, or even alkalies, need not necessarily be low, provided they are not present in the form of grains, and yet this is not wholly an insuperable objection, for the reason that the material can be ground in a ball mill. The largest markets for china clay, as kaolin is sometimes called, are located at Trenton, N. J., and East Liverpool, O., and the prices paid vary from $10 to $12 per ton, delivered at these points.

The kaolin used for paper making has not only to be white in color, but also extremely free from grit, and, furthermore, it should fall apart readily in water and also contain a sufficient number of scaly particles to insure the maximum amount possible being retained by the pulp. The object of the clay is not only to weight the paper, but also to produce a smooth surface, thus insuring the production of sharp and even lines in printing. While white clay possesses great advantages as a paper filler, at the same time it has been superseded to a large extent by powdered gypsum, which is put on the market as "pearl filler."

Other uses of kaolin are for the manufacture of floor tiles, making ultra-marine, as a filler in the making of asbestos cloth and padding, as a body for paints and as a food adulterant.

HEINRICH RIES.

THE IOWA BRICK AND TILE ASSOCIATION.

THE TWENTIETH ANNUAL session of the Iowa Brick and Tile Association met in the courthouse in Mason City, Ia., at 10 o'clock a. m. Wednesday, Jan. 17, 1900.

President O. T. Denison in the chair.

Reports of members.

O. T. Denison, of Mason City Brick and Tile Co.: We have made more and sold more, and generally at better prices, than ever before. In July wages were advanced 10 per cent., and have continued so ever since. The outlook for the coming year is good, better than last year, and our stock is lower.

C. J. Holman, Sergeant Bluff: Have had a good season, better than usual, with an increase in output, prices and wages. On the whole, we have had a very flattering season. Wages were advanced from 10 to 25 cents per day. Brick advanced half a dollar.

J. B. McHose, Boone: The past season has been a boom year. I made and sold more brick, but made less money. I was tied up with big contracts made before prices went up, and was squeezed by the advance in prices. Consequently, I don't feel boomed in finances. The outlook is good. Refused orders at advanced prices. Wages advanced 20 per cent, and fuel more. Product increased in price, but not equal to the advance in cost of fuel and labor.

C. Nelson, Sioux City: Season good. We did not make many brick on account of the scarcity of labor. Could not get labor even at advanced wages, and so we did the best we could for the year. Outlook is good.

Martin & Burkett, New Sharon: Have had a very good year. Wages advanced 10 per cent. Have had better sales than ever before, and have gone into winter quarters with less stock than ever before.

S. M. McHose, Nevada, Ia.: Trade is good on both brick and tile. Wages advanced 12½ per cent. Anticipate a good season.

Frost Manufacturing Co., Galesburg, Ill. (by Harris): The past year has been gratifying in the volume of business. Have had all we could handle and more at the close of the season, and came out behind our orders. We are enlarging our plant. Have been compelled to advance prices because of the increased cost of material, and profits have not been proportionate to increased cost of production. We were caught in contracts made when material was lower, and these had to be filled. Competition has been close, and each had to fight for all he could get. We find a general feeling to ask and get fair prices and a fair profit, to live and let live.

McKissick & Kiles, De Soto: Have had a good season in output. Wages advanced 25 cents. I must have better prices, and if I have to make better prices I want others in competition to stay with me in maintaining prices. The trade works us by going from one plant to the other and carrying prices.

American Clayworking Machinery Co., Bucyrus, O. (by G. C. Stoll): The past season has been very gratifying indeed. We have had more orders than we could care for. Our prospects are good, and could not be better unless we increase our capacity.

F. E. Swift, Washington, Ia.: Have run steady on brick all season, and sold nearly all. We are now running on tile. The tile stock is lower than it has been for four years. Wages advanced 25 cents per day.

O. T. DENISON, President, Mason City, Ia.

Mason City Clay Works, F. A. Stephens, Manager: This firm is a new born babe, and has not much to say yet. We are building an up-to-date plant.

Webster City Brick and Tile Works: Have had good trade at good prices, and have a good stock on hand.

Cedar Falls Brick and Tile Co.: Made more brick than last year, and sales were made easier. Difficulty and lack of experience with a new dryer prevented making more, but have learned how to adapt it to our clay. Outlook is good. We ought to hold our prices up. If prices were cut in two we would not sell more brick.

E. M. Freese & Co., Galion, O.: The past year has been very satisfactory. We have been very busy and prosperous.

W. W. Lewis, Williamsburg, Ia.: Sold all the brick I made, and made all I could. Expect to enlarge the plant. Wages advanced 10 per cent. Advanced prices some Jan. 1. Competition is strong, and, of course, I blame the competitors for the low prices.

E. M. Pike, Chenoa, Ill.: I make no brick and tile. Sold my plant, and am buying tile. Low-priced tile are cheaper than high-priced coal. The prices of tile and coal given don't harmonize; it don't pay. I have always advised holding up prices. I made nothing smaller than four-inch tile. It costs as much to lay three-inch as four-inch, and they do not make as good a drain. Many tilemakers sold all they had at prices that were too low, and worked at midnight trying to make something, and now are trying to get the tile up to living prices. Don't work for nothing. I left tile on the yard if I could not get fair prices for them.

Hicks Bros. & Keiser, Dysart, Ia.: Sold all and could have sold more. Will enlarge the plant. Believe in keeping prices up where there is a fair profit.

W. C. Mitchell, St. Louis, Mo.: I am representing a brickyard specialty, and find business very good.

George H. Kettell, Tipton, Ia.: Make both brick and tile. The season has been good. Wages and coal are higher. Prices have been firm and advancing. Competition has not bothered us so much. If we can't get our prices we keep the goods. Will improve in the spring to keep up with the trade.

A. H. Loomis & Son, Clermont, Ia.: This was our first season, and this is our first convention. We came to learn. We gained lots of experience last year, and hope to do better next season. We are in a wooded country, but could not get wood enough, and had to learn to burn coal.

The Clay-Worker, Indianapolis, Ind. (by D. W. Stookey): We realize that the clayworking industries, in their high degree of advancement, need trade literature, and we are publishing an up-to-date, practical trade magazine to meet this demand.

Prof. S. W. Byers, Ames, Ia.: In conducting a series of experiments in connection with the preparation of the paper to be read before you, I have had occasion to visit different plants, and have been pleased to note signs of prosperity. I found few brick on hand. The universal report indicates that many more could have been sold during the season. We think of installing a plant at the state college at Ames, to utilize the finer product; that is, to train young men in the science of clays and clayworking.

Madden & Co., Rushville, Ind.: We have had a prosperous year, and have been busy trying to meet the demands of the trade.

W. B. Lower, Sioux City, Ia.: Our sales have been 25 per cent. over those

of 1898. Wages have increased 15 per cent. The outlook is bright. Have a good stock on hand that we could have sold, but are holding for better prices in the spring. The brickmakers of Sioux City are friendly and rejoice in each other's prosperity.

M. V. Dibble, Clermont, Ia.: We have had a successful business during the past year. (Mr. Dibble is foreman for Loomis & Son, on the old Larrabee yard.)

I. C. Waterbury, representing Brick (publication), Chicago, Ill.: I coincide with what Mr. Stookey has said, as the country becomes older literature is needed. Have enlarged our plant, etc.

Robert Goodwin, jr., Redfield, Ia.: Have had a very successful season. The cost of labor and coal both have advanced. We made more goods, sold at better prices, and made more money, than last year. At times we were 30 to 60 days behind orders, and so we took advantage of the opportunity to advance prices.

In the absence of Mayor Britt from the city the city attorney, Mr. McDermott, was introduced to deliver the address of welcome. He said that he regretted that the mayor could not be here to extend the hospitality of the city. He assured the members that they were heartily welcome.

He stated that he was wholly unprepared to tender a formal welcome, and said that there were many reasons why the convention should be welcomed to Mason City, among which might be mentioned the hospitality inspired by the fraternal feeling of local interests in clayworking. The modesty of the President prevents me from speaking of his part in the enterprise, energy and judicious foresight and management that has done so much in the development and upbuilding of our pushing city. We recognize him as a representative citizen, and one to whom we owe much of our development. First, because he furnishes wares admirably adapted to and which enter largely in the construction of a substantial city such as we have. Second, because he is an employer of labor, which is conceded to be one of the vital essentials of the progress and stability of a prosperous city. His is a conspicuous example of that cordiality that should ever exist between capital and labor.

Again, we extend to you a cordial welcome, and should you ever in your rounds choose to come again to our city we will assure you a hearty welcome.

Annual address by President O. T. Denison, Mason City.

PRESIDENT'S ADDRESS.

The last year of the century has been one of great business activity and general prosperity among all the people of Iowa, and the clayworkers have shared in that prosperity. We need not here discuss the causes of this industrial activity, but we may counsel together how best we may aid the continuance of this prosperity and how best we may contribute to the general good of our several communities and thus to our individual advantage. We cannot separate ourselves from our environment and say we may be prosperous and happy while our neighbors are in a depressed condition. The clayworker prospers or is depressed along with his community.

The past years of financial depression, when we, as clayworkers, were well nigh discouraged, have not been years of unmixed evil. On the contrary these years of depression have been to us all helpful years.

When demand has fallen to almost nothing and competition among sellers of clay wares has grown fierce and strong, we have been compelled to study our business closer and improve our methods and lessen cost of production by every means, until now we are better than ever prepared to offer building materials at prices which will get us the business. We are not compelled to advance prices of our wares so large a per cent. as are the lumbermen. The supply of clay is not limited as is the supply of lumber. Our market is growing up around us, as our towns grow and spread out around our factories, and as our prairie farms are improved and subdivided. The lumber forests are of slow growth and fast being depleted. The lumberman must go farther and farther from his market for his lumber and pay more and higher freight rates on his product.

J. B. McHose, President Elect, Boone, Ia

Already the Pacific coast and Southern States are levied upon for the building of structures in Iowa. Prices of lumber have advanced twenty to forty per cent. in the last year. Inevitably this advance must continue from year to year. Already the advance in the price of lumber has had the effect to stop the erection of many proposed farm buildings. Builders must come more and more to the use of clay wares in all structures in city, town and country. The day is not far distant when dwellings and barns will be as universally built of brick as they are now made of wood, both in town and on the farms.

How best shall we meet the demand for more and better building materials at lessened cost to the consumer?

The tendency of the age is toward combination and this offers the solution of the problem for the clayworkers. The word "combination" is a word of terrible import to some statesmen, to socialists and demagogues, but a little study takes away all its terrors. Two or more men forming a partnership for the conduct of any lawful business is a combination. Until this combination is strong and controls large capital and far-reaching business transactions it has no terrors for any one. When it grows strong in capital and business it is a "trust."

I do not wish to be understood as favoring combinations, or persons or concerns for the purpose of controlling the prices of wares nor for controlling the supply of any commodity. This would be useless, as competition always has and always will regulate both. The rapid decline of some large combinations of industrial concerns, which were recently formed to control the price and output of certain commodities, has shown that competition will regulate both price and supply, and that no aggregation of capital for such purpose can be large enough nor strong enough to survive.

What I wish to urge is that we may combine capital, skill and business abilities of many men in associations for the manufacture of clay wares and thereby get the best results, and lessen the cost of production. The more brick or tile I turn out per year the less they cost per thousand, the lessening selling price increases the sales, and there you have the problem solved. Larger sales at less price, larger output, less cost to the consumer. The per cent. of business, putting into it knowledge, capital and skill, is a "combination." The same two or more men forming a corporation for the profit to the producer is less, but the large sales make gross profit much more.

For instance, brick in this city is sold for just one-half the price of a few years ago, and made from the same clay bank as formerly.

At $12 per thousand no brick were used, except the few the circumstances compelled the use of. At $6 per thousand, millions are used, at a profit to the consumer and the demand is increasing.

I venture to guess the profits of the business and the benefits to the community from the wages paid to labor are vastly more than when the high price to the consumer ruled.

An association of capital, skill and business knowledge in the use of latest improved appliances and methods in manufacture of clay products is a combination which will work out the problem of low cost to the consumer and yet leave a fair profit to the combination. Competition will fix the price low enough.

As we have seen, the large advance in the price of lumber has already curtailed its use, so will a large advance in the price of brick and tile lessen the consumption.

The manufacturer of clay is entitled to a fair profit on his capital invested. If he does not get this, he must fail to keep up with the march of progress, must fail to improve his methods and processes which will lessen the cost of production and he must soon quit the business. In either event the consumer is the loser as well as the clayworker.

The annual meeting of this Association for the helpful exchange of experience, for friendly intercourse of competitors, is of large benefit to the clayworker of Iowa.

It is hoped that this meeting may be more helpful than any preceding one, and that we may yet see every brick and tile maker in Iowa attend these meetings. I hope that you may all feel that this is your meeting, that you will freely express your ideas upon all topics of common interest, ask all the questions you have in mind and feel at lib-

erty to address any gentleman here upon any question relative to clay or clay-working, and I feel confident that you will be met and treated as a gentleman in search of knowledge.

SECOND SESSION.

The meeting was called to order by President Denison at 2 o'clock, the first in order being a paper entitled

BRICK DRYING.

By G. A. Wild, Cedar Falls, Ia.

Drying brick is one of the most important branches in brickmaking. That brickmaker, who has solved the problem of drying his brick in a manner economical as well as expedient, practical as well as reliable, in all kinds of weather and under all conditions, must be considered fortunate, and beyond the annoyance and trouble that this branch of the business brings to other more unfortunate fellow-brickmakers.

Indeed, the manufacturer who can rely upon his drying apparatus every hour in the day, every day in the week and every week in the year for efficiency, economy and reliability, is fortunate, and ought to be satisfied and proud of his good judgment, or, perhaps, good luck, in securing a dryer that is beyond the criticism of other competing dryers.

What brickmaker has not looked over his yard many times in search of dry brick and failed to find them. After again reassuring himself that there were none in his yard or sheds, how gloomy he looked, disappointment could be seen on every line of his face, but after some moments of serious thought and contemplation a look of stern resolve and strong determination might have been seen on his countenance. He could not afford to let his men lay off; he could not afford to let them do some other work that brought no immediate return; he must set brick, and he did set brick. We all know what the outcome is. At least I have a slight suspicion that we all do.

There is no doubt, in my mind, that "God's free air" is a very good drying medium, and that it has qualities of drying that perhaps no artificial dryer can boast of. The question may be asked, is it really the cheapest and best method of drying? Which I will answer neither in the affimative nor negative, but leave to general discussion.

Without going any further into details, I will briefly state our experience in drying with the ardent hope that it may do some one some good. This paper, however, is open to criticism, for in no other way than by discussion can we bring out the good and bad points of any paper.

Our company had just such ordeals to go through with as above mentioned. During rainy weather we had contracts on hand that had to be filled; brick would not dry, and something had to be done. We considered a good many ways of drying—direct heat, steam and fan dryers. We compared their first cost and the operating expenses after installation. Our choice was an inside fan dryer, and I will say that we are not sorry that we bought it.

The objection to so many dryers is the cost of operation. In all steam dryers I believe some live steam has to be supplied at some time to dry brick regularly, and live steam means fuel, and fuel represents dollars and cents. Of course, the dryer men would not accede that fact that it is expensive to dry brick in their dryers; each one had the cheapest to operate, and the most effective as to results. There are absolutely no bad dryers on the market, according to their version. This reminds me of a letter we received on inquiry to some fellow-brickmaker in this State. His reply was that dryer men are like machine men. We must not believe more than half they say, or, in other words, if they say they will dry 20,000 brick per day the dryer will only take care of 10,000. This we acted upon, and I must say the man was right.

Our dryer has three tracks 75 feet long, holds 10 cars on each track, and we dry our very sensitive clay in 45 hours perfectly dry, and without checks and without one pound of live steam.

There are ten 60-inch diameter fans in the dryer that run at a speed of 375 revolutions per minute, and the air is distributed quite evenly throughout the dryer, owing to its peculiar construction on the inside. At first we had six radiators, composed of 3,800 feet of one-inch pipe in our dryer, but found that we had too much heat. The clay would not stand it, and the brick would check. After several months of very tedious and expensive

G. A. Wild, Cedar Falls, Ia.

drying and testing we struck the right conditions, and we only use now about 1,900 feet of pipe to supply heat to our dryer from exhaust steam. The temperature at the receiving end is about 75 to 80 degrees, and at the other end about 110 to 120 degrees. The brick dry without damage, and are perfectly dry when they come out.

The cost of running fans is very light; in fact, at times I think amounts to nothing, on account of the fans acting as a condenser on the pipes containing exhaust steam, which causes a vacuum on the engine, and, of course, a saving of power. It has been stated repeatedly that exhaust steam cannot be conducted through one-inch steam pipes and confined in them without causing back pressure at the piston of the engine. Permit me to say that this is erroneous, and if any one doubts my statement I will invite him to visit our works, when we are running, and I will convince him that we have no back pressure, but a vacuum of 4 to 7 inches at times. Two gauges are affixed to a five-inch exhaust pipe from a Corliss engine, and we can tell exactly what our dryer is doing for our engine or what our exhaust steam is doing for our brick.

We have enough exhaust steam to supply two more dryers of the same size that we have now, and the more pipes and fans we have the more liable we are to get more vacuum.

At present our escape or relief valve is partly closed, and we let the largest portion of exhaust steam from a 14 by 36 engine escape. To prove that fans act as condensers, I may say that when we have both valves wide open, the valve in the pipe leading to the dryer and the escape valve, we find that quite a little steam is drawn through the pipes, and considerable heat is radiated even then by the radiators. One condition, however, is essential for obtaining the maximum amount of vacuum; that is good drainage. The reason for this we find in the fact that the steady and continual current of air condenses very rapidly the exhaust steam in the pipes, and water will accumulate in the pipes and radiators, which is held up to some extent. But if a deep drainage is provided water will and must discharge by gravity out of the radiators, and for that reason a drainage of 33 feet would be most desirable, for then no water could possibly be held up in the radiators by atmospheric pressure, and exhaust steam would be more liable to be condensed. An old well would admirably serve for such purpose. With no drainage whatever this system would work quite well, only it will take several pounds of back pressure to keep the pipes clear of water.

These are all conditions that we have experienced in practical use at our plant. They are not theories, but well established facts.

The merits of this system can be readily summarized in these words: It is reliable, practical and economical.

With enough drying room for cars and radiators any plant can, at a moderate cost, have a dryer that will dry its entire output during the daytime run, no matter how large the capacity of the plant may be. This drying can be done with no extra cost for fuel or help, only by exhaust steam, and under the supervision of the superintendent of the plant. Not only is this way of drying economical, but it is positive as well. Outside influences have little effect on the dryer, for the air supply as well as the supply of steam can be easily regulated to suit any outside temperature.

The brick are dried solid, and are sound after burning. This was not so at first, and we lost a good deal of money by the brick being ruined in drying, yet the same experience, perhaps, would have confronted us with any other dryer. Clays are so different in their composition and structure that perhaps no two clays will act alike in drying and burning. Those of us who have handled different clays will undoubtedly appreciate the fact that each clay must be handled according to its peculiar nature. This is true in drying the same as it is in burning and making brick.

In describing this process and speaking about it in the terms I have I had not in mind to advertise this special system of drying or praising any particular kind of a dryer. When our worthy Secretary asked me to write a paper on drying I agreed to do so with the intention of not writing a general paper on drying, for such we have had already, but it was in my mind to give the Convention our own experience at our plant during the past season, thinking that this paper might do some good and bring forth what is so

essential to make a convention a success, namely, a discussion. (Applause.)

DISCUSSION.

Mr. Chamberlain: What is the cost of your dryer?

Mr. Wild: This one cost $1,800, but I could construct it now for $1,000, not including building. We are drying 11,000 daily. We put 636 brick on a car, as we find that we can dry a heavy load as easily as part of a load, thus increasing the capacity of the dryer by the use of heavier loads. We have 30 cars in the dryer. Our clay is a joint clay, with sand, grit and pebbles. It is not shale, but is a surface clay, and will not stand much heat in the dryer. Moisture is found in the middle of the dryer and on the surface of the first two or three cars that sweat as the moisture comes from inside of the brick. There is an opening 3 by 3 feet long opposite the radiator. Fans pass the air zizzag through the dryer.

Mr. Gledhill: The paper is an excellent advertisement for the Phillips dryer, and yet others using the Phillips dryer don't think it worth scrap iron. It evidently suits Mr. Wild's peculiar clay. When he says he could rebuild for it $1,000 he probably don't take into consideration the increase in the cost of material. The pipes alone will cost almost $1,000. It is possible to adjust any dryer and dry any clay, but it must be adjusted to each clay, and unless it is it will be worthless. His clay stands the air after two days, and is not extremely hard to dry.

Mr. Wild: I do not want to advertise any dryer, and I only give the facts as I find them in my clay.

Mr. Harris: This matter of drying clay is the application of known forces of nature. We do not dry our clays from the inside outward. It is not so that the moisture dries from the inside of the brick first. If a brick partly dried is broken it will be found to be moist inside. Any process, natural or artificial, is simply bringing the moisture to the surface and carrying it away. The temperature must be adjusted to the special clay. For $7 you can construct a box with a lamp and thermometer and make a small dryer and test your clay, and can thus determine the data of temperature and circulation applicable to your clay, and then you can build a dryer in accordance with this known data. Mr. Wild has experimented with a full-sized dryer, and has learned his temperatures.

Mr. Denison: It has always seemed to me that the temperature and the volume of air is all that there is to it. You heat the air to thin it, and thus increase its capacity to carry moisture. Question, what do you figure the cost of drying per 1,000 brick?

Mr. Wild: Not much of anything, since the fan reduces the back pressure on the engine by increasing the condensation in the pipes.

Paper, "Tests of Clay Product," by Prof. A. Marston, Ames, Ia.

TESTS OF CLAY PRODUCTS.

By A. Marston.

One of the most important factors in the rapid progress of civilization in the nineteenth century has been the great development in the manufacture of the materials of construction. If we were still as restricted as to the quality, kinds and amounts of these materials as were the men of the comparatively recent past there is hardly one of the great modern inventions which would be of much real use to mankind. But the century at whose close we now are entered upon has seen the substitution of scientific methods in place of blind tradition in all the arts. Chemistry, physics, geology and all other branches of science are now called upon for aid by manufacturers, and a single decade in the present often brings greater development than ages have seen in the past.

A necessary result of the use of scientific methods in improving the manufacture of the materials of construction has been the development of means for accurately testing the quality of those materials. Progress was necessarily slow so long as use and time were the only means of telling whether a proposed change in methods would benefit or injure the product, but now all the materials of construction can be subjected to accurate tests. In some lines manufacturers must even maintain expensive testing laboratories of their own. In the manufacture of steel, for example, chemical analysis of each melt must be made before it is poured, and specimens of the finished product of each melt are tested to destruction on powerful machines. Even in

PROF. A. MARSTON, Ames, Ia.

lines of manufacture in which private testing laboratories are happily not required, every manufacturer who tries to keep the pace in modern competition by improving his methods so as either to cheapen the cost of production or to improve the quality of his products should make free use of the public testing laboratory, for it is his strong ally.

Besides being necessary to the manufacturer in improving his methods, tests of the materials of construction are of great value to the purchaser in enabling him to be sure of securing materials of good quality. In connection with the use of structural steel, for example, it is customary for the engineer of any important work to keep a close watch, often through one of the organized bureaus of inspection, of the metal he is to use from the time when it was still in the ore to the time when it occupies its final place in the completed structure. The metal is subjected to rigid tests before it is used. In connection with the use of the other materials of construction, also, the practice is continually growing of inserting in the specifications for all important work exact tests which the materials must pass before they are accepted. This practice not only prevents fraud but also promotes economy, since the engineer does not require so large a factor of safety in his designs when he knows that his materials are perfectly reliable. The safety of the general public is also guarded.

But the requiring of tests in specifications is perhaps of even more value to the manufacturer than to the consumer, for how could the honest manufacturer live and do business if no distinctions could be made in specifications between his wares and those of unscrupulous competitors. There could be no incentive to manufacture better materials if they could not be made to bring a better price. Moreover, it has been found by actual experience that rigid specifications have proven one of the strongest incentives to improvements in methods of manufacture. It is said that Captain Eads's strict requirements for the material for the great St. Louis bridge revolutionized the manufacture of steel in this country, and so did much to put us in the lead of the world in that industry.

Another very important use of tests of the materials of construction is in the development of new factories, quarries and mines. Every section of a new country like ours has many yet undeveloped resources, whose utilization is greatly retarded by lack of knowledge of their possibilities. For example, it is not so very long ago that most of the building stone used in and near Cincinnati was shipped from places as far distant as Maine, although inexhaustible quarries of the finest limestone are located just at hand. Any new material must have its reputation thoroughly established before it will be extensively used, and to make its good qualities known by any other way than by careful tests requires a long period of time. Perhaps the recent establishment of the American Portland cement industry is the most striking illustration which we have of the value of tests in shortening this time. Fifteen years ago all specifications called for European Portland cement, and doubtless there are yet many in whose eyes the word "imported," when used in connection with Portland cement, seems still surrounded by a sort of halo. Careful tests have shown, however, that much poor and unreliable cement has been imported, and that American Portland cement equaling, if not surpassing, the best imported cement is now on the market in the largest quantities. American engineers now recognize this fact, and freely use the American product. The writer does not wish to be understood as saying that cement tests have been the only factor in bringing this about, but he believes that without the free and now universal use of such tests the development of the manufacture and use of American Portland cement would not have reached its present stage for several more decades.

There are, then, four ways in which tests of the materials of construction in general are of value: First, to the manufacturer, by enabling him to ascertain the results of his endeavors to improve methods and better his product; second, to the consumer, by detecting defective material; third, to the manufacturer, by furnishing a strong incentive for him to improve the quality of his products; and, fourth, to both the manufacturer and the consumer, by enabling them to develop and utilize with safety the products of new factories and quarries. In all four of these ways tests of clay products are of especial value to the clay industries of this and adjoining States. The total value of the clay products of Iowa in 1898, the latest year for which we have statistics,

was over $2,000,000. Is there any reason why this should not be made several times greater, as in some of our Eastern States? To be sure, we do not have the great markets of the large cities like New York and Philadelphia, but neither do we have the sharp competition of fine building stone. Brick is the natural building and paving material for the prairie regions. Iowa is a large and rich State. We have inexhaustible deposits of the finest clays, and inexhaustible mines to furnish cheap coal. Is there any reason why we should not make the finest pottery, terra cotta and ornamental brick, not only for home use, but also for export?

But we need not speak only of the possibilities in developing new lines of manufacture, for the writer will venture the assertion that there is not a brick or sewer pipe manufacturer present at this meeting into whose legitimate territory building brick, paving brick and sewer pipe are not imported from other States. The writer knows of many cases in which these imported materials are sold at higher prices than the home product. If we should even suppose that the imported wares were better in quality, or handsomer in appearance, than those which could be bought at home, this ought surely to be the strongest incentive for us to improve until we surpass competitors in these respects. But from the writer's experience he is led to believe that in many cases the home product is actually better in quality as well as lower in cost. In the case of one structure with whose erection he was recently connected he proved by actual tests that the Iowa brick were not only cheaper, but better. They were also handsomer, and the completed Campanile tower in question is one of the finest appearing structures of its kind in the country. Yet in a large city near the Iowa kiln which made these brick hundreds of thousands of press brick are imported from adjoining States. Of course, it may sometimes be necessary for architectural reasons to import some particular shade of brick, but in other cases it is against public interest to waste money in higher prices for poorer articles, while at the same time discouraging home industries. Recently the writer was arranging with an architect of the above mentioned city the plans for a proposed $150,000 building. In talking over the cost of the press brick required the architect named the high price for imported brick, and seemed dubious about using the cheaper home brick because doubtful as to their quality.

The writer believes that the proper way for home manufacturers to meet such a state of affairs is to have careful and extensive tests made of all their grades of brick, and then thoroughly to advertise the results. They may be sure that the purchaser wants the best brick for the least money, but they may also be sure that architects, engineers and purchasers agree in desiring to be certain that the materials which they use in important structures are perfectly reliable as to quality. One of the very best advertisements a manufacturer can publish is the certified favorable report of results of careful tests of his products.

We are forced to confess that part of our home manufacturers are not yet fully awake to the importance of this matter. Recently the writer, in carrying out tests which were designed mainly to help Iowa brick manufacturers, has run across instances showing that they are behind their competitors in this respect. In collecting specimens for these tests the firms corresponded with were informed that they would be furnished a copy of the results as far as concerned their own brick; that these results would not be published in such a way that they could be identified without their consent, and finally that they were not asked to contribute to the expense. Two years ago two large paving brick companies, one in Iowa and one in Illinois, were communicated with at the same time in connection with some paving brick tests. The Illinois firm at once shipped the desired specimens free of charge, but it was only after months of delay and several letters that they could be obtained from the Iowa firm. The writer now has under way some press brick tests, to be made by two students of the Department of Civil Engineering of the State College. Identical letters were sent out about two months ago to ten firms, six in Iowa and four in adjoining States. Three of the four firms outside the State at once shipped the specimens desired, with all charges prepaid. So far only two of the six Iowa firms have made any response whatever. The writer does not wish to be understood as making any

F. A. STEPHENSON, Treasurer, Webster City, Ia.

complaint whatever concerning the good will of the other parties. The two letters received were most cordial in pledging co-operation, and the writer has no doubt that further correspondence will enlist the hearty co-operation of the remaining firms, but the fact remains that the Iowa manufacturers showed themselves more backward in the matter than did their competitors, and that such backwardness undoubtedly leads to financial loss in their sales.

Probably one reason why Iowa brickmakers have not done more in the way of having their products tested in the past is the fact that they have not known of any accessible testing laboratory. The expense of sending to Eastern laboratories and of paying their heavy charges have rendered tests impracticable. The writer desires to say that now, however, the Civil Engineering Department of the Iowa State College, at Ames, is fully equipped to make all the standard tests of materials of construction, and that, as the department makes no charge to citizens of the State for the use of the testing machines, nor for the supervision of the tests by the regular officers of instruction, the cost of tests is far below the ordinary charges of testing laboratories. This department has already been engaged for four years in making tests, at its own expense, of Iowa building materials, with a view to furthering their use. Owing to limitations as to the time and means available these tests have not progressed as rapidly as was desired, but some of the results have already been published in the proceedings of the Iowa Engineering Society for 1898 and 1899, and in the reports of the Iowa State Geological Survey, Vols. 7 and 8. An instance has already been mentioned in this paper in which tests made by the department led to the use of Iowa brick in preference to imported. It may further be said that in the case of the $300,000 historical building, the erection of which has been begun by the State at Des Moines, the superintendent of the Iowa quarry from which the stone for the building is procured has stated that his stone was selected in preference to imported, largely as a result of some of the department tests.

During the last two years the department tests have been especially devoted to paving brick, because they are the kind of brick for which tests are commonly prescribed in specifications. A paper giving some of the results of these tests was read one year ago at the eleventh annual meeting of the Iowa Engineering Society, and it lead to the appointment of a paving brick committee of that society to investigate this subject. Besides the Civil Engineering Department the departments of Mining Engineering and of Agricultural Chemistry of the State College at Ames were also prepared to investigate questions in connection with the clay industries of Iowa. Also the State Geological Survey was doing valuable work along the same lines, and this association had appointed a committee to agitate the matter of clay investigations. To secure the co-operation of all these interests a meeting was called at Ames June 14, and the organization of a joint commission for clay investigations in Iowa was effected, with Mr. H. Foster Bain, assistant state geologist, as secretary, and with the writer as chairman. The committee representing this association pledged the co-operation of the brick manufacturers. The geological survey detailed for the work Prof. S. W. Beyer, who is also the head of the Mining Engineering Department of the State College. He will himself present to you some of the results of his work, but I may say here that he has already visited all of the paving brick works of the State which were in operation in 1899, has collected samples of the shales and clays for physical tests by himself and for chemical analysis by Prof. J. B. Weems, of the State College Department of Agricultural Chemistry; that he has taken measurements of the shrinkage of the brick during manufacture and of the maximum temperatures during burning at various places in the kilns, and finally that he has collected a large number of brick for tests from the places in the kilns where the temperatures were measured. Several thousand of these test brick have been forwarded to the Civil Engineering Department at Ames, where the work of testing them is now well along. All the ordinary tests are being applied to them, and this is being done to a much larger number of each kind and with a much greater completeness than is customary. These tests, as planned by the Civil Engineering Department at Ames, are to be duplicated in part at the State University as a check on the work. It is

proposed that the committee of the Iowa Engineering Society shall collect statistics, such as the extent, cost, manner of laying and present condition of all brick pavements in Iowa, and that it shall prepare standard specifications both for the paving brick themselves and for their laying. Each member of the commission is to be at liberty to publish the results of his own work from time to time as he sees fit, but it is proposed to collect these results finally, and to publish them for free distribution as a bulletin of the State Geological Survey.

It is hoped that this work may lead in the near future to the establishment at Ames of a ceramic laboratory for clay investigations, in accordance with the resolution passed one year ago by this association, but as all the work of that laboratory, except the tests of clay products, will be under the charge of my colleague, Prof. Beyer, I will leave this matter to him.

The work now under way constitutes in some respects the most extensive and complete set of paving brick tests ever yet undertaken, and its results ought to help settle some disputed points. For, in paving brick tests as in all others, there are still many unsettled questions regarding both the manner of conducting the tests and the interpretation to be given the results. It is very important in all tests that they be made exactly in accordance with carefully studied out standard specifications, even as to the minutest details, as otherwise different experiments would obtain different results from the same material. It is also very important that the interpretation of the results should be made only by skilled experimenters, perfectly familiar not only with all details of conducting the tests which can possibly affect the results, but also with the process of manufacture or with the geological history of the specimens. Otherwise the conclusions arrived at are likely to prove at variance with the results of that test of all tests, the behavior under actual use extending over long periods of time.

It may be said of brick tests, as of all others, that there is no one test which alone can absolutely be relied on in passing judgment. There are a number of tests, all of which should be made, and the results of all should be considered carefully, as should also all other information which can be obtained regarding the material tested. It should also be clearly understood that in all tests of brick and stone there will be wide variations in the results obtained on specimens from the very same kiln or quarry. Hence a large number of tests should be made and considered before passing judgment, and the lack of uniformity and its causes should be carefully noted and considered.

All tests of clay products, as well as of other materials of construction, may be divided into two classes, which we will term respectively direct tests and indirect tests. Direct tests are those in which the specimens are given treatment intended to initate, at a greatly accelerated rate, the action of the same destructive agencies which the materials must resist in actual use. An indirect test is a test simply of some quality or property of the material which enables it to offer resistance to the destructive agencies. In general, direct tests are of much greater value than are indirect, for there is no one good quality of brick whose good effects may not be more than overcome by other defects. On the other hand, direct tests alone are not sufficient, for none of them reproduce infallibly the effects of the actual destructive agencies, and even if they did we would still wish to know why the brick failed or did not fail in addition to the mere fact.

In the case of paving brick the standard direct test is the rattler test, in which the brick are made to tumble and pound in a rapidly revolving foundry rattler, the object being to reproduce the effects of impact and abrasion in the street from horseshoes and wagon wheels. The result is determined by measuring the per cent. of loss in a given number of revolutions. Until recently this test was not standardized, and the results obtained by different experimenters could not be compared, but now, through the efforts of the National Brick Manufacturers' Association, a standard rattler is coming into use. This rattler is made of cast iron, is 28 inches in diameter by 20 inches long, has 14 sides separated one-quarter of an inch, and is revolved at the rate of 30 revolutions per minute. Two methods of conducting the test are still being used and discussed. According to the N. B. M. A. specifications nothing but the brick to be tested are put in the rattler, and enough are used to fill 15 per cent. of its volume. Many experimenters think that in the case of underburned pavers this method does not give correct results, because the brick are too soft to pound each other severely enough. These experimenters follow the lead of Prof. A. N. Talbot, of the University of Illinois, who would use only 5 to 14 brick in the charge, but would add 7 to 10 per cent. of the volume of the rattler of a mixture of even parts of eight-pound and one-pound cast iron brick. The dimensions of the eight-pound brick are about 2⅛x3⅛x5¼ inches, and of the one-pound brick 1 1-16x1½x2½ inches. The heavy brick are intended to give the impact effect, and the light ones the abrasion effect. In the paving brick tests now under way at the State College we are carrying through parallel tests by both of these methods, and as we are working with what we know are underburned brick, as well as with No. 1 brick, from every Iowa factory, we hope to help settle which is the better way. In our work we weigh the brick at frequent intervals during each test, so as to obtain data for the complete curves of loss.

The indirect tests of paving brick, which should always be made in addition to the rattler test, are the transverse test and the absorption test. The transverse test is of especial value, because it detects hidden flaws, and completely exposes the interior structure. By a careful study of the interior structure of each brick, comparing its strength as developed by the test, the experimenter can obtain information regarding the characteristics of the brick which cannot be gotten in any other way. In our work at Ames we have found that the N. B. M. A. specifications for conducting the transverse test are faulty in several particulars. We test the brick on edge, supporting them on steel knife edges rounded each way and placed six inches apart. We apply the load to an adjustable steel knife edge, rounded one way and placed at the top of the brick, midway between the lower knife edges. To keep these knife edges from cutting into the brick we use three steel bearing blocks, ¾ inch square by 1¾ inch long, with all corners and edges rounded.

Absorption tests of paving brick are made on rattled brick. According to the N. B. M. A. specifications the brick are dried in an oven 48 hours, weighed, im-

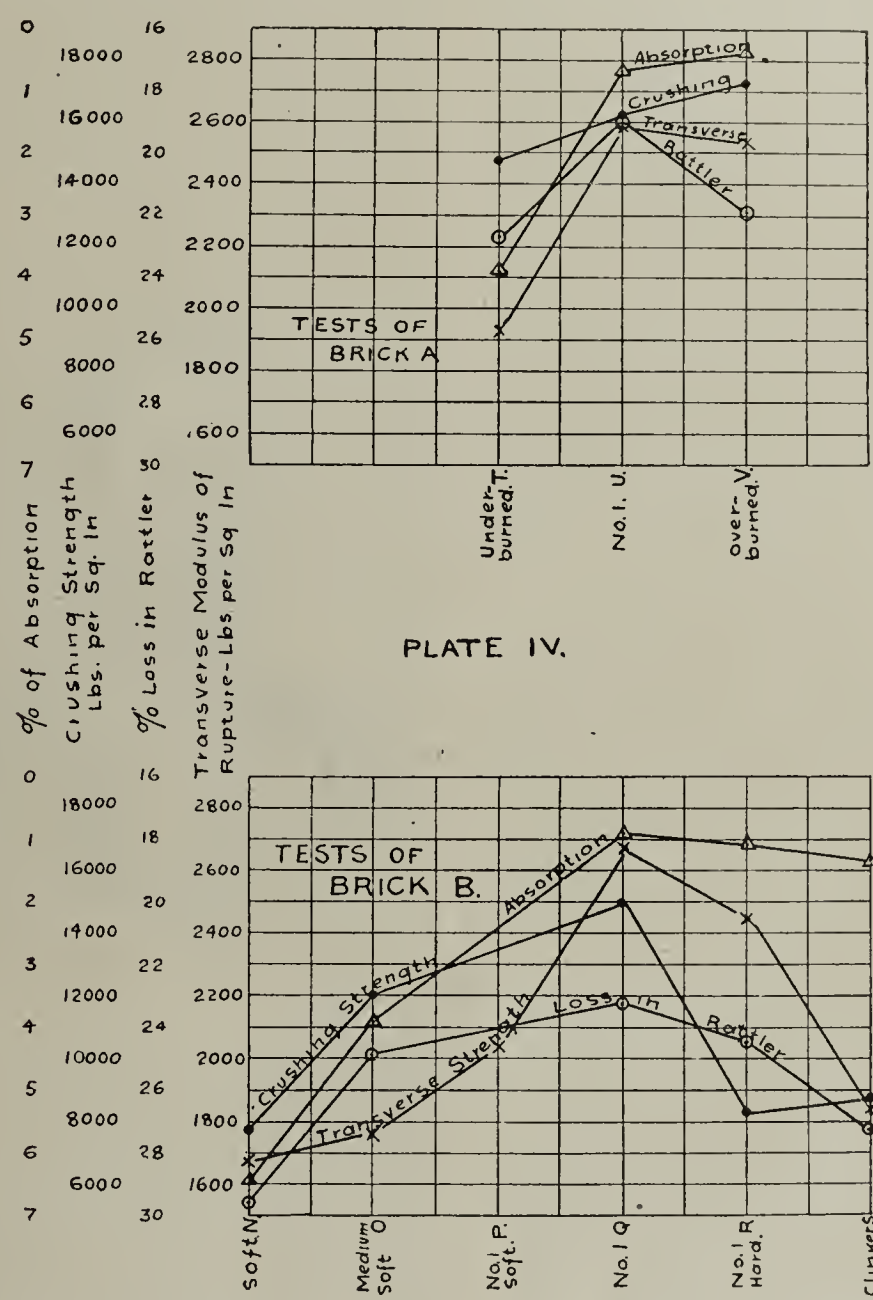


PLATE IV.

mersed in water 48 hours and then weighed again. In our work at Ames we keep them immersed a long time, weighing at intervals, so as to obtain the complete absorption curves. In interpreting the results of absorption tests it should be rememberd that the per cent. of absorption depends not only on the quality of the brick, but also on the material from which it is made, and hence absorption tests will not be of great value in comparing shale brick with brick made from inferior fire clay.

Crushing tests of paving brick are difficult and expensive to make, and although for the sake of completeness we are including them in our work at Ames, they probably do not give much information of value which is not furnished by the transverse tests.

Some authorities have been inclined to discard also the transverse and the absorption tests, but the writer is of opinion that this would be inadvisable. That all four of the tests have value is shown by the accompanying diagram, taken from a paper by the writer, giving the results of experiments made at Ames in 1898. The lower half of the diagram illustrates with especial clearness how each of the four common tests gives better and better results as the excellence of the brick increases, until that temperature in the kiln is reached at which No. 1 brick are produced, and then gives poorer results as the brick become overburned. These relations between the results of the different tests and the quality of the brick are often obscured by the fact that the variations between the results of tests of individual brick from the same kiln are greater than the differences between the qualities of the average products of No. 1 brick from different rival kilns.

Tests of press brick and of common brick have not yet been standardized to the same extent as paving brick tests. The most direct test for brick used in buildings in this climate would be to determine the resistance of the brick to actual freezing and thawing. This test has not yet been applied to brick to any great extent, but we propose to try it at Ames in the press brick test which we now have under way. We will soak pieces of the brick in water and then alternately freeze and thaw them, using a freezing box in which we have found that by the free use of salt and ice we can maintain a temperature of about zero F.

The common, indirect tests of building brick are those of the crushing and transverse strengths and of the per cent. of absorption. To some extent the strength tests may be considered direct tests, since cracks often occur in walls, and brick piers sometimes crush. At Ames we conduct the transverse and absorption tests in the same way as in our work on paving brick, except that we use pieces of brick of dimensions not exceeding two inches each way for the absorption tests, and that we dry them until they cease to lose weight. We make the crushing tests on one-quarter to one-half brick, flatwise, using plaster of paris beds and adjustable bearings.

In both building brick and paving brick tests the hardness and specific gravity are sometimes determined.

In conclusion, the writer desires to make an offer to the brick and tilemakers of Iowa, in behalf of the Civil Engineering Department of the Iowa State College at Ames. The department offers to make any tests desired without any other charge than reimbursement of money actually paid out in conducting the tests. This money would consist of transportation charges not prepaid, of drayage, of the small cost of any materials required for the work, and of the wages at 15 to 25 cents per hour of trained students who do the manual labor of the testing, under the direct supervision of the department officers of instruction. No charge will be made for this supervision nor for the use of the testing machines, and the total cost of such tests already made has been very light. (Applause.)

DISCUSSION.

President Denison: This paper is the result of the request of the conveniton held last year at Sioux City. Mr. Tupper recommended that this association request the Legislature to make appropriations leading to the establishment of a school for clayworkers at the college at Ames, similar to that at Columbus, O .

Mr. Pike: This paper is very valuable. Brick is a lasting and valuable building material, and the paper shows how to advance their use. For lack of organization of those interested in the use of brick as a building material it is not being used as it should. In Chicago they are shipping building stone

R. Goodwin, Jr , Secretary, Redfield, Ia.

from Maine for public buildings simply because Maine granite is brought prominently before the architects. Another example is to be seen at Cresco, Ia. Why ship stone from Maine for Iowa buildings when Iowa brick are better building material? Simply for the lack of bringing before the government officials the tests and facts showing the unequaled advantages of burned clay as building material, stone is shipped for our buildings, and we taxpayers pay for it. The sooner we get this in proper shape before those in authority the sooner this money will be kept at home.

D. W. Stookey: Evidently the twentieth century brickmaker must be more than a worker in clay. He must be a politician, a lobbyist and a shrewd and intelligent business man, who can bring the advantages of his goods before the public and push their sales to the place where they belong, against the competition not only of intrinsic worth, but of scheming advocates of other materials with which he comes in competition.

Mr. Tupper: We appreciate the value of the tests and investigations being made at the college at Ames to bring the merits of burned clay as a building material before the public, and let us, by resolution, help to get the $150,000 appropriation for the aid of the mechanical department of the college.

Mr. Harris emphasized the need and justice of the appropriation that would redound so much to the benefit of the people.

On motion the matter was referred to the Committee on Resolutions, requesting them to embody the matter in proper resolutions.

Paper, "Hollow Building Blocks," by Lynn W. Denison, Mason City, Ia.

HOLLOW BUILDING BLOCKS.

By L. W. Denison, Mason City, Ia.

Our first knowledge of the hollow building blocks comes from a man by the name of Drake, of Chicago, who, about twenty-five years ago, spent his whole fortune making and trying to introduce them.

The people at that time were well satisfied with common brick and would not look into the philosophy of hollow block, and, therefore, Mr. Drake failed, though at the present time millions of them are used in Chicago.

Our first attempt at the manufacture of hollow brick was in 1895, when the Baptist Church, of this city, was erected.

A hollow brick, manufactured in St. Paul, Minn., was specified for lining all exterior walls.

Feeling confident that we could make these brick and save them money, the building committee changed the specifications, and we secured the contract for these hollow brick and at once began to turn them out.

These brick were common brick size, 2¼x4x8 inches, with a ¾x3-inch air space.

The parties were very much pleased with them, as the wall showed no frost, though plastered in January and February, but we were not as well pleased with the manufacture of them for these reasons.

We could not turn them out as fast as we could our common brick. When put on the car for the dryer, if the car was bumped against another car in the dryer, the brick would collapse, and, again, there were many broken in handling after they were burned, and all around there was quite a loss.

Seeing the faults of these small hollow brick we began the manufacture of the large hollow blocks.

We at first made a block 8x8x12 inches, but found that they were so unhandy in laying that the bricklayer must lay down his trowel and use both hands to get them in place, and so finally abandoned this size and made a 4x8x12 inch, which we found to be a success, as it could be handled by the bricklayer without laying down his trowel. With this size, 4x8x12 inches, we also make a 4x8x10-inch, which breaks joints, and a 4x4x8-inch, which closes all jambs and corners, these sizes making an eight-inch wall.

We also make a 4x4x12-inch and a 4x4x10-inch, which, with the other bricks for an eight-inch wall, make a twelve-inch wall, binding every course both lengthwise and crosswise.

These hollow blocks are all figured down to a basis of our common brick, 2¼x4x8 inches.

They have many advantages over common brick. The air space makes a dry, frost-proof wall. The plaster is applied direct to the bricks, thus cutting off all ex-

pense of lathing. They take one-third less mortar than common brick. In a twelve-inch wall we have three separate air spaces as a nonconductor of heat and cold. The hollow bricks, at common brick measure, are much lighter, weighing only 2.63 pounds, while our common brick weigh 4½ pounds. Thus, they have advantage over common brick in freight, hauling, handling and hoisting to place in the building. Fifty per cent. more wall can be laid per day of hollow brick than of common brick. At the first use of them here the bricklayers objected to them on the ground that they made less days work on the building for the bricklayer. They have since found that there are more brick buildings built on account of the lessening cost to the owner, and, consequently, more days work for the bricklayer, and bricklayers are now advising the use of hollow blocks.

By means of the hollow block we are able to compete with stone, which is so abundant in this locality.

Good limestone, with good beds, suitable for a rubble wall, can be bought for $3 per cord, delivered at the building in this city.

Common solid brick cannot be laid in walls to compete with stone, at this price, in our city, but with hollow blocks, we can compete, on account of the less space required for the brick walls, and no furring or lathing being required on the hollow blocks.

We have shipped these blocks to Dakota, Minnesota, Wisconsin and many towns in northern Iowa, each year shipping more than the year before, and also a greater distance, and I am sure there never will be a limit to their use. (Applause.)

—Discussion.—

Question—What per cent. of the blocks are lost in burning?

Answer—That depends largely upon the clay. Not all clays will make hollow blocks. It requires a close clay. With the Mason City clay the loss is very small. In burning the blocks are set on end, like tile, and as close together as possible.

Paper, "Shrinkage and Fusion Points of Certain Iowa Clays," by Prof. S. W. Beyers, Ames, Ia.

SHRINKAGE AND FUSION POINT FOR CERTAIN IOWA CLAYS.

By S. W. Beyers.

At a conference held at Ames, June 14th, 1899, it was decided by the representatives of the various clay interests of the State to conduct an investigation of Iowa clays and clay products, with a view to the betterment of the quality and an enlargement of the output of clay goods. It was believed to be of prime importance that a thorough knowledge of existing conditions be gained before work of a remedial nature be undertaken. The Geological Survey agreed to assume the task of visiting the manifold clay-working establishments, to note carefully the character, geological position and extent of the clays used, inquire into the processes of manufacture actually practiced, and, finally, to conduct experiments and collect sufficient material for a complete laboratory investigation of both the raw materials and the manufactured products. The writer was designated to represent the survey. It was thought best to confine the work of the present season to the study of paving brick. Experiments were conducted at the plants visited, with a view to determining the shrinkage, both by volume and by weight, and also to determine the fusion point of the mixture actually employed in the manufacture of paving brick. The reason that it was considered advisable to conduct the experiments upon the shale composite instead of the individual seams was, that the heterogeneous character of the shale sections available in Iowa makes it mandatory that practically the whole section be utilized in the manufacture of all cheap clay goods. At least ten distinct seams are worked at Des Moines; while, if at other points the number appears to be less, it is only because the entire section has not been fully explored. The individual shale layers are so thin, and the competition so sharp in the paving brick industry, that the shale composite as a whole must be developed in order that the enterprise may be conducted along economical lines.

Investigations were carried forward at three different points, Boone, Burlington and Des Moines, and at six factories, four of which are located at Des Moines. Visits were also made to the paving brick establishments located at Sioux City, Sargent Bluff, Fort Dodge, Davenport, Oskaloosa and Ottumwa.

Shrinkage. It is a well known fact that brick made by the wet process undergo a certain amount of change in volume and weight when dried in the air or in a heated tunnel, and most brick experience a further change in bulk and weight during the process of burning. It is a matter of simple observation that these changes are not the same for all clays, but vary between wide limits. The shrinkage, both volumetric and gravimetric, is due almost wholly to the contained water. In the green brick water is present in two forms, as water of imbibition and water of crystallization. The first is held mechanically, filling the interstices between and enveloping the integral particles, and it is to this water, up to a certain limit, that plasticity is due. The second is held chemically, forming an essential portion of the hydrous minerals which enter into the constitution of all clays and shales, chiefly the micas, chlorites and kaolin itself which forms the basis of all clays. It is the office of the drying kiln to remove the water mechanically held, and, other things being equal, the time required for its accomplishment and the amount of volumetric shrinkage produced depends essentially upon the size of the clay particles. The finer the grain the greater the time required and also the more marked is the change in volume. There appears to be no direct relationship between the changes in weight and volume in the drying kiln. The reduction in volume appears to be due to the particles settling together on the withdrawal of the water. The finer the grain the greater is the number of particles per unit volume and hence the greater is the shrinkage.

During the burning the product suffers a further reduction in volume and weight. Here again, as in drying, the amount of shrinkage in volume, up to the point of incipient fusion, depends upon size of grain, while the shrinkage in weight depends almost wholly upon the chemical composition. The fineness of the grain, in the first instance, and the greater the percentage of hydrous minerals in the second, the greater the shrinkage in both.

Contraction in volume is due to the closing up of interstices, which is only completely accomplished at the point of complete fusion, or when the constituent particles have completely lost their identity. The contraction in weight is brought about through the destruction of the hydrous minerals by the driving off of the water of crystallization. This is effected at a red heat or at a temperature of from 1,200 to 1,400 degrees F.

Fusion Point. The term fusibility, as applied to clay, is a very indefinite term. Clays do not pass from the solid to the liquid

Table showing the Air and Fire Shrinkages, Total Shrinkages (linear, volumetric and gravimetric) and approximate Fusion Points.

Works	Location	Serial No.	Air Shrinkage %					Fire Shrinkage %					Total Shrinkage %					Fusion Points in Degrees F.	
			Linear			Volumetric	Gravimetric	Linear			Volumetric	Gravimetric	Linear			Volumetric	Gravimetric	Incipient	Complete
			x	y	z			x	y	z			x	y	z				
CAPITAL CITY	DES MOINES	I	3.0	3.2	3.0	8.9	8.5	3.9	6.3	3.9	12.7	12.7	6.9	9.5	6.9	21.6	21.2		
		II	3.3	3.4	2.9	9.3	12.2	4.9	7.1	5.8	15.7	9.5	8.2	10.5	8.7	25.0	21.7	2100±50	2250±50
		III	3.2	3.4	3.2	9.5	9.5	4.7	5.1	5.3	14.2	11.2	7.9	8.5	8.5	23.7	20.7		
FLINT	DES MOINES	I	3.4	4.2	4.0	11.2	13.4	5.1	7.0	5.2	15.0	8.8	8.5	11.2	9.2	26.7	22.2		
		II	3.4	4.5	4.2	11.6	11.9	4.6	7.0	5.3	14.6	10.5	8.0	11.5	9.5	26.2	22.4	2100±50	2250±50
		III	3.0	4.5	4.3	11.3	12.8	5.2	7.0	5.7	15.6	9.7	8.2	11.5	10.0	26.9	22.5		
IOWA	DES MOINES	I	3.0	3.4	3.5	9.6	13.4	1.2	1.5	1.2	3.2	7.1	4.2	4.5	4.7	12.8	20.5		
		II	3.2	3.5	4.0	10.3	14.2	5.3	7.0	6.2	15.9	7.2	8.7	10.5	9.7	26.2	21.4	2100±50	2250±50
		III	2.7	3.3	3.3	9.1	14.1	6.0	7.3	6.2	17.0	6.9	8.7	10.6	9.5	26.1	21.0		
MERRILL	DES MOINES	II	3.7	3.1	3.0	9.5	13.8	4.3	6.9	4.0	13.5	9.3	8.0	10.0	7.7	23.0	23.1	Insufficient data	Insufficient data
		III	2.9	2.7	3.0	8.4	14.6	5.8	7.3	5.6	16.3	9.7	8.7	10.0	8.3	24.7	24.7		
GRANITE	BURLINGTON	I	1.6	1.6	2.3	5.2	6.7	2.1	6.9	2.4	9.8	12.8	3.7	8.5	4.7	15.0	19.3	1900±50	2100±50
		II	2.0	1.5	2.1	5.5	4.9	2.5	9.5	5.5	16.1	14.1	4.5	11.0	7.8	21.6	19.0		

In the above table Serial No. I = underburned; No. II = first-class pavers; No. III = over-burned.
In the case of the Flint II and III are about the same while the I's are sufficiently burned for paving.
x = thickness; y = width; z = length.

state abruptly, but through a series of transition stages. Wheeler designates three stages important in the manufacture of clay products. If a clay be subjected to a gradual increase in temperature, a point will be reached where the particles will settle together and the individual gains can no longer be recognized. This is the point of incipient fusion. If the temperature is increased from 100 degrees to 300 degrees F. beyond this point the mass will undergo a further contraction, though slight, and exhibit a porcelain-like fracture when cooled. This marks the point of complete vitrification. The mass, while heated, is stiffly viscous and permits slight movements between its particles. If the temperature be carried still higher the clay mass begins to warp and sag, and, perhaps, through the decomposition of certain mineral compounds, bubbles of gas are formed, which cause the brick to swell and assume a scoricaeous or slaggy structure. This, according to Wheeler, marks the point of viscous or scoriaceous vitrification. The fusion points, as above defined, are dependent upon the chemical-mineralogical composition and especially upon the size of the clay particles. I say chemical-mineralogical composition rather than chemical composition, advisedly, because the experiments of Wheeler and Ries demonstrate that the mineralogical constitution has more influence on the refractoriness of a clay than its chemical composition, and estimates of its fusibility, based upon chemical analyses alone, would be grossly misleading. For instance, lime and magnesia, in the form of the silicates, act as a flux and, consequently, lower the fusion point, while if present as carbonates, would greatly increase it. The finer the texture, other things being equal, the lower is the fusing point, and, consequently, the arenaceous shales of the coal measures require more heat to produce a complete vitrification than the gritless shales of the Devonian. Another factor important to the manufacture of clay goods requiring incipient to complete vitrification, is the temperature range between incipient and scoriaceous fusion. Certain clays have a range of only 100 degrees or 200 degrees F., while others show a difference of from 500 degrees to 600 degrees F. In ordinary kiln practice it is impossible to control the temperature so that extreme differences of from 300 degrees to 500 degrees F. will not exist. In order to guard against a large percentage of underburned brick on the one hand or an undue loss on account of slaggy brick on the other, a wide interval between incipient and scoriaceous fusion is imperative.

The accurate determination of high temperatures has always presented grave difficulties to both chemists and physicists. Of the numerous ingenious schemes devised and methods employed, only two are of sufficient reliability and practical simplicity to merit notice in this connection. The first is based on the electric thermopile and may be designated the thermoelectric pyrometer or thermometer of Chatelier, its inventor, and is rated accurate to from 10 degrees to 25 degrees F. The second is based upon a mixture of kaolin and fluxes, so compounded as to form a graded series with constant differences in fusion points between consecutive numbers. These kaolin mixtures are usually made up in the form of cones or pyramids, and are known as Seger's cones or pyramids, being named after their originator, and are considered reliable within 25 degrees to 50 degrees F. The original system has been somewhat modified and perfected by Cramer, Seger's collaborator in their Berlin laboratory. While the electrical contrivance is the more accurate, its delicacy and initial cost, as yet, are almost prohibitive to small firms. In the temperature tests recorded in the present paper Seger's pyrometric pyramids were used.

In order to determine the shrinkage, fusion points and temperature range between incipient and scoriaceous fusion, seventy-five brick were taken as they came from the machine, separated into three equal groups and serially numbered. Each brick was weighed upon a spring balance, accurate to one-half ounce, and stamped in the three directions with a standard two-inch gauge. The brick were then run into the drier and given the usual treatment of the particular factory. After coming from the drier the brick were reweighed, and the gauge marks carefully measured with a flexible steel rule, accurate to one-hundredth of an inch. The brick were then placed in the kiln with a view to determine not only the temperature at a given point, but also the range of temperature in the kiln, and, perhaps, gain some idea of the temperature interval between incipient and scoriaceous fusion. With these ends in view, one group was placed at the center and near the floor of the kiln, a second was centrally located near the top, and the third was placed near the mouth of a bag, almost, or quite, in position to receive the direct heat of a furnace, supposedly the hottest place in the kiln. An assorted series of Seger's pyramids, obtained from Professor Edward Orton, Jr., of Columbus, O., were distributed with each of the groups. After the burning the brick and cones were recovered so far as possible. The brick were weighed again and the gauge marks remeasured. The cones turned by the heat were noted and recorded. The results are given in the subjoined table. The Capital City, Flint and Iowa brick were side-cut and repressed; the Merrill side-cut, and the Granite end-cut. (Applause.)

Many members expressed their appreciation of the paper and the work of the professor, and also their realization of the need of just this kind of assistance.

Paper, "Down-Draft Burning," by L. C. Besley, Council Bluffs, Ia.

Mr. Besley being absent his paper was read by the Secretary.

DOWN-DRAFT BURNING.

By L. L. Besley, Council Bluffs, Ia.

Having been requested by the Secretary to write an article for the convention and choose my subject, I have decided on this one as the one which I am at the present time most interested in, as I have been experimenting for the last year with down-draft kilns.

A year ago this spring, prompted by the feeling of progression, I started out to make some improvement in my product in the way of better burning and, if possible, at less expense, and after consideration decided that it was to be on the down-draft process. Now how to go about it. A friend of mine whom I knew was using down-draft kilns to his entire satisfaction, asked me several times to visit him and offered to give me all the information he could on the subject, so I concluded to do so. I found him hard at work, as all good brick makers are during the busy season, but still had time to help a friend.

He had a battery of four down-draft kilns running to a single stack. He showed me the construction of the kilns and flues and explained everything to me and said the kilns were of no particular patent and that I was at liberty to use them, but that the furnaces were a patent coking furnace and if I used them would have to pay a royalty per furnace.

I stayed all day with him and helped him burn, saw the brick he was producing and was so well pleased that I decided to put up one kiln and if satisfactory to put up more.

I returned home and immediately laid off my ground and put up a kiln twenty-three feet in diameter, with one center flue 20x24 inches, with six cross flues 4x12 leading to it. I then built a stack three and a half feet in the clear and forty-five feet high, made arrangements to try the coking table furnace and put in ten of them on the kiln. The patentee of the furnace agreed to come and assist me in burning my first kiln. After getting the kiln and stack completed the next thing of importance was the arranging of the openings into the flues. In this I followed as closely as possible the instructions received, setting the brick very much looser than in the up-draft kilns, and left openings of six inches, two feet apart, in each cross-flue.

On completion of the setting of the kiln I wrote to the patentee of the furnace that I was ready for burning, but after waiting several days for him received a letter stating that he was very busy in the East and would not be able to give me any assistance. As it was nearing the end of October, and having no time to lose, I told my foreman to start the fires, following as nearly as possible the instructions received.

The start was made with slack coal, and everything worked satisfactorily. After four days' drying off we commenced to get up heat, which was accomplished very easily, and seemed to be able to keep up as nice a fire as could be asked for. After burning for ten days, using about twenty-one tons of slack coal, thinking the brick all hard, closed down. On opening the kiln we found ourselves very much mistaken. The outside and part of the way down were fair builders, but the bottom and center were merely salmon brick.

The only thing then left to do was to decide wherein our fault lay in order to remedy it the next time, which, of course, was an easy matter, as everybody was on hand to offer suggestions as to how to burn the kiln, but after considering them I decided that I knew less about the matter than when first starting. However, remembering that my fire worked better on the outside than in the center, I set my brick much looser in the center and closed the openings in the flues near the bag walls and also set the brick higher, thinking possibly there was too much of an air chamber above the brick and around the crown of the kiln, and fired once more with slack coal. The fire seemed to work well until towards the last, when it seemed impossible to produce the clear white heat through the kiln that was necessary, and after burning fourteen days closed down, the results being even worse than the first kiln. On opening the kiln I discovered that a mistake had been made in not drying off before getting up heat, and, forcing it against the dampness, my brick was all shaky.

I again refilled the kiln, setting the brick more open and not quite so high, closed the openings in the cross-flues so as to

drive the heat to the center and set fire with slack coal. After four days I commenced to get up heat, as the steam seemed to be gone off and the main flue showed very little dampness. I soon discovered, however, that my kiln was choking up, and commenced burning wood, deciding to dry off before burning. When sufficiently dry I commenced burning with slack coal on the coking tables. When the kiln was nicely under fire I had a call from another coking furnace man, who stayed with me the greater part of the forenoon, explaining all the shortcomings of the furnace I was using and all the longcomings of his furnace.

I kept on with slack coal, burning until satisfied that the heat was not increasing any in the kiln, and then changed to lump coal and fired direct into the furnaces, not using the coking tables. After burning fifteen days closed down and on opening the kiln found it to be a good building brick all through, with very few poor ones on the bottom or in the center. After finding the qualities of brick I decided to figure the cost of same and found that twenty-eight tons of coal had been used besides the wood. With this information I was satisfied that a great deal of fuel had been wasted by the heat passing down the opening in the cross-flues and into the stack, so that all the cross-flues closed, making a tight or solid bottom, I again refilled the kiln, setting the brick about four inches apart, forming flues from outside to center. After six days' burning with lump coal closed down, and on opening found that the kiln was not as good as the last one, the brick being very unsound.

Again I refilled the kiln, setting the same as before, except setting the brick a little closer near the bag walls and more open near the center, forming three flues, one in the center and one on each side about half way from the center to the outside. This time I burned nine days, using four cords of wood and twenty-one tons of lump coal at an expense of about $1.95 per thousand for fuel and labor, and found when opened that the kiln was a very good building brick, with an even burn all through.

With these results ends my experience for the season, and although having not been able to burn as hard a brick as in the up-draft kiln, still think better results can be obtained. It is my intention to raise my stack ten or fifteen feet higher before burning again, thinking that a stronger draft will be of benefit to me.

Any information regarding the operation of down-draft kilns or any suggestions that may lead to the more successful operation of my style of kiln will be thankfully received. [Applause.]

—Discussion.—

President Denison: Some clays will not stand the degree of heat necessary to burn to the center of large kilns, unless fired slowly.

Mr. Holman: Brick can be set high in down-draft kilns, if bag walls are made low enough to permit a portion of the draft and heat to pass directly into the kiln without going to the crown. I set them fifty-one high, with good results.

The President appointed the Committee on Resolutions as follows:

Mr. Holman, Sergeant Bluff.
Mr. McHose, Boone.
Mr. Johnson, Ft. Dodge.

Paper, "Drain Tile," by J. D. Raney, Fairfield, Ia.

THE MANUFACTURE OF TILE.

By J. D. Raney, Fairfield, Ia.

In the manufacture of drain tile we may consider four essentials. The first is demand, without which failure is inevitable. To best stimulate this the factories should be in localities needing this product if transportation facilities are available.

It is a practical scheme to try to educate the people to appreciate tile. Illustrate its good qualities by using it in every possible way on your own premises. Publish occasional articles in popular and local papers. Distribute Drainage Journals, and not too frequently talk a little upon the merits of underdrainage in swamp and rolling lands. Show how much fertile and locally valuable land has thus been reclaimed. The mere sanitary utility of underdrainage is incalculable. Another point—good drain tile well laid goes far toward solving the good roads problem, which is one of the urgent problems of the near future.

A second essential in the manufacture of drain tile is good material. Test the clay before building the kiln. Not all clay is

C. J. HOLMAN, Sergeant's Bluffs, Ia.

tile clay. Be scientifically sure you are right before you go ahead. The Drainage Journal has well specified the necessary characteristics of tile clay as "a good homogeneous clay free from lime pebbles that will burn to a vitrified body without cracking. The tendency of clay to crack may be determined to some degree by taking samples of clay and working them thoroughly in a doughy state. Then roll out in thin sheets and dry them. Afterwards subject them to a heat gradually increasing to almost white heat, after which cool gradually. If no crack appears it is very probable that it will make drain tile if well tempered."

Good tile is smooth inside, square cut and well burned. Care should be taken to avoid warping in drying and burning. Tile in any and all of its stages should be carefully handled. The method of setting tile in kilns depends on the kind of clay and kind of kilns. The third requisite is good machinery. There are many good machines. In fact, every machine is "the best." Yet some are far better adapted to certain clays than others. Such adaptability should be well considered if you would not enrich the machine maker with no profit to yourself. It is poor business to put in a $1,600 or $1,800 machine, find it unsuited to your clay, take it out and sell it for little more than old iron.

Go slowly in buying machinery. Let well enough alone if you have a machine that keeps comfortably ahead of expenses; hold fast to it. In buying machinery buy only and always the best whatever it costs. Look well to labor and fuel-saving devices. Have well-constructed and well-heated dryhouses and No. 1 kilns. Kilns vary as houses. They may be different yet equally good. Whatever kind they are have them good of that kind.

Study to manufacture a product that will last for centuries, not merely decades. Study your business in a practical, up-to-date way. The day for crude work in any line is nearly done. You must keep abreast with the knowledge of the times in your trade or be overreached by more progressive people. Master all the details of the work for yourself. Know the business from A to Z and so forth. Last, and not least, you want good, intelligent workmen. Especially you want a first-class engineer, a sober man or none, a reliable cut-off man who keeps his mind on his own work. The man behind the pug mill needs brains as well as brawn. His is not merely mechanical work. It requires good judgment to keep the clay at right consistency. But the grimy, sooty burners are the most important. That man who knows just how to burn a kiln of tile knows a whole lot of, to you, very valuable knowledge. Good men are always worth good wages, and you are investing at good interest when you pay them.

We claim no prophetic vision when we say the future of drain tile and its co-product, brick, will be vastly greater than the present. [Applause.]

Adjourned to have a banquet in the evening.

THIRD SESSION.

—Thursday, 10 a. m.—

Paper, "Brickmaking Now and One Year Ago," by C. J. Holman, Sergeant Bluff, Ia.

BRICKMAKING NOW AND ONE YEAR AGO.

By C. J. Holman, Sergeant's Bluff, Ia.

Brickmaking one year ago and now is about the same. The conditions have changed. The closing of the year 1899 has set another mile post on the great highway, a post which is conspicuous for changing three figures on the calendar, and as marking the starting point of a new century. A prosperous year, in which our country has nearly recovered from a period of depression such, as we are told, seldom comes but once in a generation. Let us congratulate ourselves that the brick industry has weathered the storm so well. While being among the last to suffer, we are recovering in a manner that is gratifying to the present and encouraging to the future.

To write an article on the improvements in the clay industry and confine ourself to one year, and that year so full of activity as to demand our closest attention, would be to review the general prosperity of the country and repeat the numerous articles which we have been reading in our morning papers. The improvements in methods of manufacturing have been confined (so far as we have noticed) to finishing up

and perfecting those already well under way. The great improvement has been in "tone and volume," and the encouragement that the brickmaker, as well as nearly all other manufacturers, have received as their share of the general prosperity so marked during the year since our last convention.

We could hardly keep within the bounds of one year in writing or speaking of the improvements in methods of manufacturing that have taken place and made such radical changes in the clay industry, and which have been so universally adopted. They have been continuous and important for nearly a score of years. But one of the first items of interest in our line which we notice during the year is that our Iowa Brick and Tile Association, having graduated at the State Capital nearly two years ago, is now making a tour of the State, with fair prospects of becoming popular. It is gaining friends and has received a hearty welcome thus far; and, judging from the present gathering, it has also caught the spirit of "prosperity," and bids fair to become a healthy and helpful organization. May it grow and prove to be a source of usefulness to the clay industry of our State.

We, as clay-workers, are approaching the new century on a higher plane, under more favorable conditions and with a much larger field of operation than the industry has ever known in the years past. Our business has enlarged, not only in quantity but in character, with new and improved methods of manufacturing, improved systems of burning, greatly enlarged facilities for handling, until it has become recognized as one of the most important industries in our land, showing the result of study, of patience and skillful attention. We are entering the new year also with bright prospects for another profitable season in all directions. During the last twelve months, as we have been gathering headway and striving to keep abreast with the new conditions, we have met and accepted a higher scale of wages, an advance in fuel bills and general expenses, but with corresponding increase in prices for our product, an increasing output and a brisk demand. Let us profit by this improvement, and by a united effort seek to still enlarge our field and endeavor, so far as we can, to maintain a healthy profit to the benefit of all, recognizing the rights of our competitors and meeting our competition in an honest and honorable way, to which end a good rousing convention is of prime importance and benefit to all who attend.

In looking over the past and noting the great improvements and changes that have taken place during the last score of years in all branches of the brick industry, from the old open-yard process to the present methods of manufacturing, with its ponderous clay-crushers, Corliss engines, heavy brick machines, grinding and crushing the clay with deafening noise, the boys picking the well-formed brick from endless belts, the iron cars taking them to steam-heated tunnel dryers, large and expensive covered kilns, where the fire is not allowed to escape until it has done its work and the brick are all hard no soft corners, no ragged arches, no cold spots to watch and work over during the long nights—we cannot help but sympathize with the few who yet remain in the old soak pit, the man with the shovel—brother to "The Man with the Hoe," but no brother to the ox, and not without brains, but a man who, during the last year, has been thinking, and since attending one of our annual brickmakers' conventions, where, on his way home, he visited a new and modern brick factory. He has been thinking that he must fall out by the wayside and leave the business altogether, or fall in line and join the procession, and, like "The Man with the Hoe," who, when last heard from, had gone West and bought a prairie farm, where he was putting his sulky plow in a new toolhouse and getting out his self-binders, preparing to harvest his quarter section of ripening grain in one of his fields, so, the "Man with the Shovel," having made the acquaintance of a friendly banker in his neighboring town, and finding that money was cheap and brick high, has concluded to become a twentieth century brickmaker, throw out his old soak pit, place an order for a full set of new machinery, build some "patent kilns" and start anew, with his stock of experience and a good bed of clay as a foundation. Let us wish him success.

But what of the future? Are we near the top? Let the boys laugh when they tell us that improvements will still go on; but in what direction? Will the perfect brick machine be invented, that will turn out all good, smooth, sharp-cornered, well-tempered brick, and no repressing required? Will the long-sought coming kiln ever come, where the brick will all be burned just hard enough and no waste? Will the time of nearly thirty days between the clay bank and the finished product be shortened? Will electricity be taught to work in clay and come to the relief? Will the business ever advance so far as to be stripped of some of its hard work? These are questions to be solved and answered by future conventions.

It is enough for us to look to the present, profiting by the past. Gather our fruit as it ripens, cut short the waste, clean up and keep a tidy-looking yard (one of the ear-marks of success), look close after the details, keep the machine running, be kind and just to our men, pay as good wages as the price of our product will admit, thus helping to solve the labor question, extend a hearty welcome to visitors—they may prove to be customers and will be sure to speak a good word—improve the quality of our wares in every way possible, bearing in mind that good goods always command good prices; and, finally, let us renew our efforts to the end that we may complete the record and leave a page in the history of the clay industry of our country that will be turned to by the young brickmakers as marking a time at the turn of the centuries when our calling attained a position before the commercial world to which it was justly entitled. (Applause.)

—Discussion.—

E. M. Pike: One of the good features of this paper is that it recommends good work. If we put out even a few good brick they will be noticed, and every one knows that faults travel fast. It is best to put poor goods on the boneyard. If they go out to the trade there is no one there to defend them, and they go as the product of the yard, and are likely to be considered as fair samples.

Mr. Denison: That is our practice. If there is any question whether a tile is too soft or not, we break it at once and leave no doubt. If a customer gets even one soft tile or brick he sees that one and says, "I got that at Mason City," and he not only condemns that piece of brick, but his suspicions are aroused as to all.

Paper, "The Individual Application of Modern Trust Principles to Clay-working," by C. B. Platt, Van Meter, Ia.

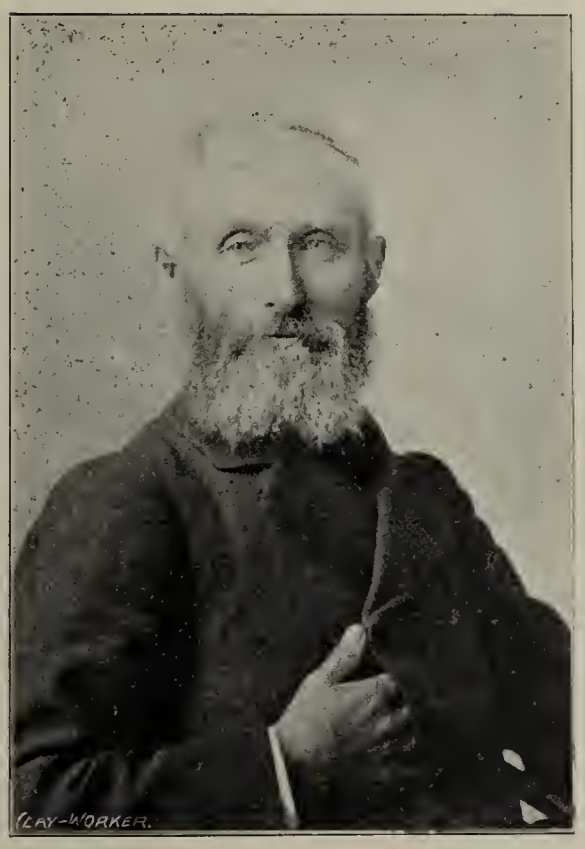
THE INDIVIDUAL APPLICATION OF MODERN TRUST PRINCIPLES TO CLAY WORKING.

By C. B. Platt.

We will try to lose sight of the possible wrong in the principles of the trust and consider only that which seems to be a step in the right direction. While we may be able to see much in the trust which we consider harmful and condemn it on the whole, we will have to admit that it is founded on true business principles. It would perhaps be unkind and unjust to say that all who despise the trust as a neighbor would be glad to entertain it within their own walls, but the observation would be true to human nature. Time only will tell whether the trust is to be dreaded as a raiser of the prices of competition and a harm to industry or not. The trust, so called, is, in fact, nothing more than a corporation, usually a large one, and is not an association of individuals to keep up prices and fight competition wherever it appears. The formation of laws regulating the modern trust is consequently most difficult. If it is desirable to clip the wings of the trust, or rather to cut its suspenders, we must fight it on its own ground. In looking into the trust idea it appears that the trust is built upon a foundation of economy and business skill or business knowledge. Let us consider the conditions in the industrial world which call out the necessity for trust formation. We find on investigation that but few industrial enterprises are successful. That is to say, the cost of production exceeds in most cases the selling price. This is due primarily to lack of business ability and lack of the practice of economy. Active competition cuts the margin of profits to where the expensively conducted business cannot live. It is here that the trust comes in and accomplishes success or profits where the individual has failed. Whether the trust's ultimate object is to destroy competition or not we cannot say, but it meets competition and forces it to figure from its basis of cost or to retire from the field. These trusts are headed by men of great business judgment, and they are well aware that in this country no business can long enjoy a monopoly of high prices without inducing competition. The savings and advantages gained by the consolidation of plants under one management, and that the best to be had, are matters which do not particularly interest us in this matter under consideration. We are looking for something which we can apply, and we can find many items in the operating branch of the trust which should be carefully applied to our industry. If we would observe a properly organized trust operate in the brick business we would undoubtedly observe the expenditure of some considerable money, more perhaps than we might be able to apply. There are not enough good brick makers to go around among the individual concerns now engaged in the business, and so we cannot all, even if we had the means, employ such ability as the trust would attempt at least to employ. We can, however, follow to some extent their methods of economy, and we can aid materially in establishing a condition which will lead up to a greater available knowledge in the manufacture of clay ware. The trust starts in any business with a thorough under-

standing of the needs, demands and prices of the market. They investigate from the figures of experience and success the absolute and entire cost of production and sale. There is then before them a clear-cut proposition. They know exactly what they have to accomplish, and they accomplish it or somebody suffers. It would pay any one as well as it does the trust to reward ability substantially, and while the trust is more apt to give a more substantial reward for paying suggestions and able supervising ability than the individual, it is quicker to condemn and cut off any one who may have advised a failure. The trust, in other words, looks frowningly on anything but success. It demands results. Mistakes repeated are disastrous to the manager. The trust employs only the best proved methods and plans. It demands the limit of producing ability from its machinery and its men. It does not ask more, but ever applies the spurs that the limit may be reached. Trusts succeed through the use of economy and the saving in consolidation, and they can succeed without the oppression of a cornered market. Though they drive competition from the field they do so by outclassing their competitors.

In the clayworking industry we undoubtedly have one of the surest, safest and best industries now established. The demand is constantly extending, and as each year goes by we are confronted with a broader field of operation, with broader questions and with greater chances for success. The growth of brick making has been a slow growth toward much real progress when we consider that it is as old as the world is, practically. The modern growth of the industry has been rapid, it is true, but it has been a wonderfully strange growth. There have been immense amounts of money attracted to brick making, and though there is no good reason why success should not have been universal had there been a more uniform process of manufacture, the failures have outnumbered the successes several times over. This is not surprising when one considers that in ten different clay-working plants, all making the same article, we are more than likely to see some twenty different ways of doing the same thing. The idea seems to have been to try to make brick a little differently from the other fellow. All sorts of attempts have been made to prove the laws of physics at fault, and geometry has failed to attract the attention of more than a few. One sees the product twist and turn on itself like a fox in the chase before it reaches its journey's end. The great need of the industry seems to be a more comprehensive general system which may be adopted by all. A system which has been proven to be the best for each method of brick making would soon become universal, and it would be the means of putting all on the same basis and give everybody an understanding of his competitor's natural or common power. This would reduce competition to the point of a reasonable profit production. Such experimenting should be conducted by the States. Individual experiments would be of little or no avail, would be blind in their results and would not be the property of all. We cannot well get along without experiments, and we should not attempt them individually to any great extent. It does not seem practicable that these experiments be conducted by the general government. All States have different conditions governing the manufacture of clay ware owing to the wide difference in the raw material, the difference in the market, etc. It is important, then, regardless of what may be done of a more general nature, that the clayworker lend his energies toward the establishing of a means of general experimentation within his State. It is a matter of no little importance that these questions be brought before our legislative representatives both by the individual and by a strongly organized association with the idea of gaining a favorable vote for the maintenance of a school of ceramics at the Iowa College in Ames. The State needs this school that a proper investigation of its vast shale and clay deposits may be had. The brick makers of Iowa need the school that intelligent and valuable experiments may be carried on for the good of all; that advice as to the planning and operating of clayworking plants may be had whereby the economical manufacture of brick could be carried on. It is to be regretted that our state association is not larger than it is. We need the power of numbers in pushing this ceramic school. It is the duty of every manufacturer, whatever views he



A. J. Loomis, Clermont, Ia.

holds on conventions, to become a member of this association. More real good can be accomplished through a strong state association than can be accomplished in any other way. It is not necessary to attend the conventions. Their function is largely social and for organization, but the name of every clay worker within the State should be on its roll of membership each year. As far as real benefit goes the convention has so far failed to count materially. The average clay worker throughout the country has failed to spread any very definite knowledge or advice in front of the expectant attender. The days of hidden knowledge in this industry are about passed. It will not be long before the brick maker will attend conventions for other reasons than the hope that some one will thoughtlessly hand to him the keys to success. We can easily make this association the best thing that ever happened. I ask all Hawkeyes who may read in the columns of our valuable friends, the clay journals, of what takes place at this convention to join in with us by sending their names and money ($1) to our worthy Secretary. It is difficult to look in any direction and not see in the signs of the times that we are progressing with some considerable haste toward a radical change in the application of economic questions. We are not all able to see the ends the great consolidations have in view. If we have fears of oppression we should attempt to ward it off. Leaving the consumer out for the moment in the consideration of our affair there will be little harm done by the trust to those who are conducting their business in such a manner as to make returns of profit possible under the present condition of competition. In case of an invasion of our field we would then find a disposition on the part of the trust to pay a fair price for our business. There is not much worth buying of a man who has little beside trouble. The day may come, and probably will, when the trust will want to enter our field, but it never can crush us if we fight behind its own armor—economy—and fight with its weapon—intelligence. [Applause.]

Paper, "The Origin of Iowa Clays and Shales," by H. F. Bain, Assistant State Geologist, Des Moines, Ia.

Paper read by Prof. S. W. Beyers.

ORIGIN OF IOWA CLAYS AND SHALES.

By H. Foster Bain, Assistant State Geologist.

To the practical clay-worker, a clay is any earthy material which has the property of plasticity; that is, which may, when wet, be molded, and which will retain its shape when dry. This property of plasticity is not thoroughly understood, but it is essential from the practical point of view, despite the fact that certain materials used in clay-working, are not plastic as first mined. A scientific definition of clay takes into account its composition, and, accordingly, clay is defined as a more or less pure variety of kaolinite. Kaolinite is a hydrous silicate of alumnia of the following composition:

Silica $Si\,0_2$	- -	46.5 per cent.
Alumina $Al_2\,0_3$	- -	39.5 " "
Water $H_2\,0$	- -	14 0 " "

Practically kaolinite, except in small quantities, rarely occurs pure. It is usually mixed with greater or less quantities of undecomposed feldspar and free quartz. In this form it is usually designated kaolin or more frequently clay substance. Kaolin is the material used in the manufacture of pottery and the finer grades of clay goods. The bulk of the material commonly called clay, includes a variable percentage of this kaolin with large or small amounts of sand, iron oxide, various carbonates, alkalies and other impurities, each of which influences the character of the mixture. The composition and proportions of these impurities determine the use to which a particular clay can be put.

In general, it is true that the kaolin, as distinguished from the sand and some of the other impurities, is fine grained. As a result, a very fine-grained mixture, relatively free from grit, is usually spoken of as pure clay, and, within limits, this is a correct, if somewhat crude, conception. The fineness of grain varies considerably from pit to pit, and from layer to layer, in individual pits.

It is an important factor in determining the use and behavior of a clay, and this seems to be due not only to the fact that a fine-grained clay has normally a larger portion of clay substance, but to certain physical conditions directly dependent upon

the size of the individual particles. For example, a fine-grained clay, regardless of its composition, dries more slowly than a coarse-grained one of the same composition.

All clays, together with soils and other unconsolidated beds of earthy material, are derived from weathering or breaking down of older rocks. These older rocks may be either sandstones, shales and limestones, such as are common in Iowa; or granites, porphyries and schists, such as do not occur here. The former belong to the class known as sedimentary rocks, and the latter are igneous or metamorphic rocks. The igneous rocks seem to represent the primary condition and the sedimentaries have been derived from them. Among the igneous rocks a very large number are principally made up of certain common minerals, including quartz and the group of feldspars. When a feldspar decays the chief product of the decay is kaolin, so that, originally, the kaolin is derived from the decay of feldspar. The kaolin may be gathered up by running waters, mixed with other minerals resulting from the decay of other rocks, and laid down again in some other situation. Clearly, then, there are two general sorts of clays; first, those which have resulted from the simple decay of earlier rocks, and second, those which have been redeposited, and, in the process, have become considerably mixed with other materials. The first class includes the residual clays; the second, the sedimentaries. The former are much the purer, the latter are much the more common. There are in France, England, Missouri, New Jersey and elsewhere, important deposits of residual clays, but in Iowa, owing to the action of the former glaciers, residual clays are almost entirely absent, and those occurring are of little value.

The clays found here are of wide variety, but, except in quantities, not commercially important; kaolin is not known to occur. All the clays now developed, or likely to be developed, belong to the class described above as sedimentary, and are mixtures of kaolin and various impurities. There is a wide range in the character and amount of these impurities, but the various sorts grade into each other so imperceptibly that it is difficult to classify them. In a general way the clays used fall into three groups, a, shale clay; b, loess clays; c, alluvial clays. All of these are sedimentary clays, as defined above, and all have originated through the breaking down and redeposition of previously existing rocks. Each has had, however, a little different history and each requires its own treatment and is best adapted to certain uses.

Considering first the alluvial clays, it may be noted at once that they are the most widespread, and most easily and cheaply worked. As a rule, however, they are ill-adapted to the manufacture of anything save common building brick. They occur covering the bottom lands of the rivers and are more common in the southern than the northern portion of the State. Their situation is usually favorable for working, since the railways here follow the bottom lands, and, accordingly, towns and transportation facilities are usually close at hand. They are surface clays, worked by open-pit methods, and, in the nature of things, the stripping can never be more than a few inches. Very frequently the whole section, including the black soil, is taken. If one examine a sample of such a clay with even a hand lens he will see small particles of hard quartz or sand mixed with still smaller earthly particles and bits of wood and decaying vegetation. The amount of sand is usually large, and this, with the bits of woody matter, make the material open and porous. The voids between the particles are large and are only in part filled by the clayey matter. As a result, the water passes off rapidly, and brick made from the clay can be dried in the open air. In burning, the woody matter burns out and a certain amount of the earthy matter fuses and binds the quartz grains together. There seems, however, to be no chemical relation involving the quartz itself and only the most fusible of the clay constituents is affected, since the burning is done at low temperature.

The loess clays are, like the alluvial clays, of surface distribution. They are also similar in being of recent origin. They cover almost the entire southern half of the State, are not uncommon in the northeast, and are spread over much of the northwestern area. In the north central area alone, extending over the region between Clear Lake, Sibley and Des Moines, are they absent. Even within this region they are occasionally found beneath more recent deposits of bowlder clay. The loess clays vary somewhat in composition and in genesis and yet have certain features in common in both particulars. They are normally very fine-grained and remarkably even-textured. Lamination is of rare occurrence, and usually the bottom of the section is almost exactly like the top or any other portion. The bulk of the clay mass is made up of very finely divided silica, almost too fine to be considered sand, though much of it is chemically the same. The proportion of clayey matter itself is normally small, though, perhaps, averaging above that in the alluvium. In the southern portion of the State the lower part of the formation includes, apparently, much more of the clay substance analyses showing a much larger per cent. of silica. Along the Missouri river bluffs the proportions are reversed and a considerable amount of even, coarse-grained sand is found. The worst impurity found in the loess is lime. This occurs, not disseminated, in which form it would be harmless, but in concretions or balls, and unless these be taken out or thoroughly pulverized and mixed with the rest of the clay, the resulting brick will be broken, owing to the swelling of the quicklime after burning. Fortunately, most of the loess can be worked without difficulty.

In general, it may be stated that the loess owes its origin to the glaciers, which, in recent times, covered so much of Iowa. The material of which it is composed seems to be the same as that found in the bowlder clay. It has simply been ground finer by the rubbing together of the ice and the rocks. In some way the fine material has been sorted out and spread over the country. In part, this must have been done by the waters flowing from the ice front. In part, it was doubtless due to winds which gathered the material up along river bottoms and dropped it on the bluffs, just as it does now. In large part, however, there seems to be no certain data for deciding whether the mud or water was the more active agent.

The loess is particularly well adapted to the dry press process. When the clay content is high, however, it yields good brick and tile, when worked as a stiff mud. It is not suitable for paving brick, pottery or sewer pipe.

The shale clays include, as a class, practically all the clay found in the rock foundations of the State. Certain varieties are, however, so constant and so well known that they have names and uses of their own. The shale clays are of sedimentary origin and since in the past, as in the present, the conditions of deposition have varied greatly, the character of the different beds shows a corresponding variation. The beds here grouped together include everything from rocks so high in silica as to be properly called impure sandstones or sandy shales, to soft potter's clay and what the miners call slate. The differences are those of degree. The different phases often grade into each other by direct transition. In general, these clays, particularly when occurring in the older formations, show a definite banding and a tendency to split more easily along planes here parallel to the bedding. It is this, rather than any particular composition or size of grain, which marks them as shales. This shale structure is most pronounced in the black shales which occur over the coal seams, and, in general, is better defined in fine-grained material than in the coarser. It seems, in part, to be an expression of the original bedding or stratification planes, but is also due, to some extent, to the pressure to which the rocks have been subjected since they were formed. It seems to be always developed normal to the direction of the greatest pressure and to the most pronounced degree in those rocks which have compressed the most.

Except for a somewhat denser structure it is doubtful whether shales have any properties which are not equally well-developed in the nonlaminated clays. As a general thing the shale structure only affects to a notable degree a certain range of clays, but exactly the same clay may be found with and without the shaly structure. It is common to find that the structure disappears when the clay is softened by the weather, so that the same bed is called a clay on the outcrop and a shale under cover. Since in working shales they are crushed, moistened and pugged so that the shale structure is entirely lost, it is difficult to find any basis for the common belief that the structure is valuable, that is that "shale" is better than "clay." The fact seems to be as stated above, that in this region, at least, shale structure seems to only affect certain sorts of clay which happen to be the sort most in demand.

In a material varying so widely there is, naturally, opportunity for a wide variety in treatment and many different products are obtained. The more siliceous shales are used for sewer pipe, though there are some bodies which cannot be used at all. The commoner sorts of shale are used for brick and those high in fluxes may be readily burned for pavers. The softer shales freest from mechanical impurities, are suitable for pottery, and those having the least fluxes may be made into fire brick and other refractory materials.

A clay or shale, used in the manufacture of refractory ware is usually called a fire clay. The most common mode of occurrence for such a clay is immediately below the coal bed, and it is supposed that such a clay formed the soil upon which the coal plants grew. In the process of growth these plants used up the alkalis originally in the clay, and so rendered it comparatively refractory, since alkali is the main flux in common clays. Not all fire clays occur beneath coal, however, and not all clays below coal are sufficiently free from alkali and other fluxes to be valuable for

the manufacture of refractory ware. Most deposits of such material are usually quite impure and will stand but a low heat. The main reason, however, that Iowa has not as yet become an important producer of refractory goods lies in the greater care necessary for the manufacture, their greater cost, more expensive plant and the limited demand, as compared with the demand for other grades of goods.

Shale clays are widely distributed throughout Iowa, and occur from the Trenton of the northeast, to the Lower Carboniferous of the southeast, the Upper Carboniferous of the southwest and the Cretaceous of the northwest. In the central portion of the State are the great beds associated with the coal measures, and from Mason City to southeast is an important bed of Devonian shales. In brief, Iowa has not only a wide variety of shale clays, but an immense quantity readily accessible, easily mined and cheaply to be burned. (Applause.)

President Denison: This is the third scientific paper that we have had, and I, for one, feel very grateful to the writers for them. I feel that we are getting at the basis of our business and the foundation principles upon which our prosperity must be built.

Report of Committee on Resolutions:

Be it resolved, by the Iowa Brick and Tile Association, in Convention assembled,

First—That we extend to the local brickmakers of Mason City and to Mr. O. T. Denison, our President, our sincere thanks for the elaborate reception and extended courtesies received at their hands, and to the Hotel Anderson for the sumptuous entertainment during our stay.

Second—That the thanks of this Association are especially due to the officers of the State Agricultural College at Ames and to those of the State Geological Survey for their extended labors in the clay field, for their careful tests, analyses and experiments covering the practical working of clay into the manufactured product which we believe promises so much for the development of one of Iowa's greatest manufactures.

We view with satisfaction the clay investigations and tests of clay products inaugurated at the State College at Ames, which promise to be of great value in the development of the clay industries of Iowa.

We note with pleasure the prosperity of this college, and especially the growth and increasing usefulness of its four engineering departments.

While favorably inclined toward all the requests from the college of the present Legislature, we, as the representatives of one of Iowa's leading industries, the value of whose product is already more than two millions of dollars anuually, particularly urge upon the Legislature to grant an appropriation for a new engineering hall.

We also urge the establishment at Ames, in the near future, of a ceramic laboratory for the investigation of clays, clay products and cements, because we fully believe that these industries have a great future before them and will merit the fostering of the State.

Committee. C. J. Holman, J. B. McHose, S. C. Johnson,

Adopted.

On motion the Secretary was instructed to have the resolutions printed and send copies to each clayworker, with the request that he send it to his representative, with an urgent request for their support.

A rising vote of thanks was tendered Professors Marston and Beyers and Mr. Bain, of the State Geological Survey, for their able and instructive papers and assistance.

In reply Professor Beyers, in behalf of the college, expressed his apreciation of the interest shown by the clayworkers in the college and their work, and he assured the members of the hearty co-operation of the members of the college, and said that he felt that the interests were mutual.

President Denison: The professors are as anxious to do this work as we are to have it done, if they only know what the people want. They want and need new buildings and apparatus, and

W. P. Grath, St. Louis, Mo.

we can help them, and by helping them help the people to better educational advantages.

The following officers were elected:

President, J. B. McHose, Boone, Ia.

Vice President, D. W. Stookey, Cedar Rapids, Ia.

Secretary, Robert Goodwin, Jr., Redfield, Ia.

Treasurer, F. A. Stephens, Mason City, Ia.

President Denison expressed his thanks to the members who had made this Convention so successful, and indorsed the wisdom of moving the Convention from place to place, as it was thus brought within the reach of more from the immediate vicinity in which the Convention is held.

By coming together we have made the acquaintance of our competitor, and find him to be a good fellow. There are buildings to be built in his town, and he should have the sale. The contractor comes to me for prices to beat him down with, and I will not give a cut price to injure him with.

President Denison announced that arrangements had been made to have all who cared to make the trip visit the Mason City Brick and Tile Co.'s plant, and invited every visitor to investigate any feature of the plant found interesting.

Adjourned.

THE BANQUET.

Mason City Entertains the Visiting Clayworkers Handsomely.

The banquet tendered to the visitors by the local manufacturers proved a very enjoyable affair. Hotel Anderson served an excellent feast, which was accompanied by music and followed by a series of entertaining speeches. There were a number of ladies present, which added to the social pleasure of the occasion. Mr. C. H. McNider, of Mason City, officiated as toastmaster, and started the ball with a very happy address of welcome. He was followed by Rev. C. H. Rogers, a local divine, who made a very entertaining speech, and was followed by J. B. McHose, O. T. Denison and E. M. Pike. Each in turn spoke words of wit and wisdom, to the delight of all present. The oratory was not long drawn out, but was of a satisfying character, which sent the members to bed in a very pleasant frame of mind.

THE TRIP TO THE TILE WORKS.

Thursday afternoon the visitors were treated to a trolley ride and a trip through the extensive brick, tile and hollow block factory of the Mason City Brick and Tile Company, of which President O. T. Denison is the controlling genius. Under his direction an immense business has been established. The plant was a revelation to many of the visitors. The character of the ware turned out accounts for Mr. Denison's success. Every piece of ware turned out, whether it be a brick, a drain tile, a hollow building block or sidewalk tile, must be well-nigh perfect in every particular. Neatness and good order prevailed in every department of the factory. It was an effective object lesson to every visitor, telling of the advantages of good management combined with enterprise and push. Later on we hope to give our readers a full description of the plant, with a series of illustrations.

LIST OF MEMBERS.

O. T. Denison, Mason City, Ia.; C. J. Holman, Sergeant Bluff; J. V. McHose, Boone; C. Nelson, Sioux City; Martin & Burket, New Sharon; S. M. McHose, Nevada; J. M. Harris, representing Frost Manufacturing Co., Galesburg, Ill.; McKessick & Miles, De Soto, Ia.; G. C. Stoll, representing American Clayworking Machinery Co., Bucyrus, O.; F. E. Swift, Washington, Ia.; Mason City (Ia.) Clay Works, F. A. Stephenson;

Cedar Falls (Ia.) Brick & Tile Co.; J. J. Gledhill, representing E. M. Freese & Co., Galion, O.; W. W. Lewis, Williamsburg, Ia.; E. M. Pike, Chenoa, Ill.; E. Hix, Dysart (Ia.) Brick & Tile Co.; C. W. Mitchell, St. Louis, Mo.; G. A. Wild, Cedar Falls, Ia.; E. G. Ulrich, Cedar Falls; George H. Kettell, Tipton; A. J. Loomis & Son, Clermont; M. V. Dibble, Clermont; D. W. Stookey, representing T. A. Randall & Co., Indianapolis, Ind.; Prof. S. W. Beyer, Ames, Ia.; Thomas Madden, Rushville, Ind.; W. B. Lower, Sioux City, Iowa; I. C. Waterbury, Chicago, Ill.; Robert Goodwin, Jr., Redfield, Ia.; George H. Hartwell, Chicago, Ill.; Redfield (Ia.) Brick & Tile Works; A. M. Felts, Fort Dodge, Ia.; Fort Dodge (Ia.) Brick & Tile Co.; J. H. Abel, Fort Dodge; S. C. Johnson, Fort Dodge (Ia.) Clay works; W. P. Grath, St. Louis, Mo.; L. E. Chamberlin, Tiffin, Ia.; A. C. Tupper, Mason City; Gethman Brothers, Gladbrook; Lynn W. Denison, Mason City; C. L. Smith, North English; L. E. Bentley, Tama; L. M. Harris, Rockford; Prof. A. Marston, Ames; E. Barr, Austin, Minn.; H. A. Smith, Deep River, Ia.; B. Hinkley, Luverne, Minn.; Iowa Brick & Tile Co., Mason City, Ia.; C. A. Rawson, Des Moines; W. T. Patton, Gowrie; J. M. Pratt, Earlville, Ill.

CULLS FROM THE IOWA CONVENTION.

Many pronounced this the best convention that the Iowa Association had held for years. There was a healthy, hopeful, wide-awake air that could be seen and felt throughout the meeting.

The investigations made and the papers read from the college at Ames and the State Geological Survey have done much towards intelligent work, and will greatly aid in placing clayworking on a definite scientific basis.

The brick interests were largely in the ascendancy. Drain tile and tile drainage are gradually losing ground at the conventions, although the older members remember that when first organized the various state associations were tilemakers almost entirely.

A. H. Loomis & Son, of Clermont, Ia., are operating the old ex-Governor Larrabee yard, and came to their first convention for information.

L. E. Chamberlin, formerly of Tiffin, Ia., is arranging a plant at Creighton, Missouri.

There seems to be a growing demand for hollow brick and hollow building blocks. Northern architects and builders are realizing the need of something with which to build warmer houses, and the hollow block or brick, with its dead air space, furnishes an excellent material.

Walls with hollow spaces are not as damp and frosty as solid walls.

After twenty years of study of the best methods of manufacturing clay goods the members realize that they must give more time and thought to the sale of their wares. There was a growing disposition shown at this convention to push the advantages of burned clay as a building material before the people, and much thought is being given to this matter. The up-to-date clayworker is going after his market armed with sound arguments in favor of his goods.

The Mason City Brick and Tile Co. is making curved hollow blocks for building stacks. The blocks are curved to fit the circle of the chimney. Double walls are built, and President Denison says they are very effective.

After a sleet storm which covered the sides of all the stacks with ice, it was noticed that the ice on the solid brick stacks melted off within a few hours, while that on the hollow block stacks remained until the ice thawed from moderate weather.

The value of "hand-to-hand" meeting and "heart-to-heart" talks between members was again wonderfully shown. The clayworker who stays at home and thinks he gets the convention from reports is missing half.

One member said that the enthusiasm he received there alone would enable him to go home and make more money than the convention cost him.

The resolutions adopted by the convention clearly show that the Iowa clayworkers realize the need and the value of scientific aid in their work, as well as their determination to make systematic efforts to gain the much needed aid. Doubtless the plans outlined in the resolutions, if energetically worked, will do much towards securing the intelligent co-operation of the scientists at the college and the practical clayworkers throughout the State.

The high prices of lumber and the superior value of burned clay as a building material will do much towards advancing the clayworking interests of the State.

The remarkable increase in the use of building brick in 1898 over 1897, as shown by the statistical report and the unprecedented demand during 1899, vividly show the growing favor of brick, and also show to the Iowa brickmaker that his field is one of the greatest manufacturing interests in the State.

A NARROW ESCAPE.

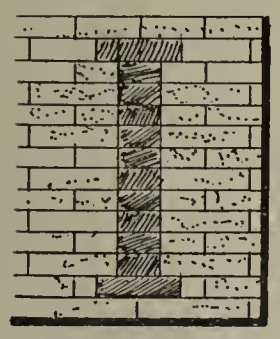
LAND OWNER—"I've no objection to you fishing in my pond to-night, but I'll warn you to keep away from my hen-coop."
JIM—"All right, sah."

JIM—"'Twuz a pity to drown de fowls, but it wuz lucky dat de pond wuz so handy."

STANDARD PAVING BRICK TESTS.

A Review of the Work of Standardizing the Rattler Test.

New Standard and Specifications Adopted by the N. B. M. A.



IMPORTANT ACTION on this subject was taken at the Fourteenth Annual Convention of the National Brick Manufacturers' Association, which met at Detroit, Feb. 7 to 10, 1900, and the standard methods of that body, which have been in force since February, 1897, were somewhat altered.

The history of the testing of paving brick in this country is not a long story, and it may be well in this connection to give it a slight review.

The first tests applied by engineers were the rattling tests for toughness, strength and hardness, and the absorption test for vitrification and immunity from frost. For the first ten years of extensive brick paving in this country these tests were everywhere used, but without any uniform method or under conditions which permitted of the least comparison of the results obtained by different engineers. Each city was a law unto itself in this matter, and many very absurd specifications and demands were made on paving-brick manufacturers, which became more and more difficult for them to meet.

—Work of the National Brick Manufacturers' Association.—

To remedy this condition the National Brick Manufacturers' Association, at their Ninth Annual Convention, appointed a commission of seven members, three of whom were engineers, to investigate the subject and to recommend standard methods for conducting such tests.

This commission called in the aid of four other engineers of experience and training, and, after two years' work, brought in a report of 120 pages, which was published in pamphlet form by the society as a part of their proceedings for the year 1897.

This report, which was by far the most careful and thorough investigation which had been made up to that time on the subject, recommended that the absorption test be abandoned as misleading; that the cross-breaking and crushing tests be omitted as unnecessary, and that the sole method of valuation should be the rattler test, executed as in the following specifications:

The standard rattler shall have a diameter of twenty-eight inches and shall be twenty inches in length. It shall be built of cast iron, a fourteen-sided polygon, in cross-section, and shall make 1,800 revolutions at a rate of thirty per minute. The charge shall consist of bricks only, one kind at a time, enough being taken to equal in their united volume, about 15 per cent. of the cubic contents of the rattling chamber. They shall be clean and dry, as nearly as possible in the condition they are taken from the kiln, and their loss in weight shall be calculated in percentages of the original weight. The average loss of two such charges shall constitute an official test, and be reported as one result.

This report was duly ratified by the Association and was published widely at that time, in the hope that municipal engineers would take it up and adopt it in their respective cities. This expectation was realized in a number of instances, and quite a number of rattlers were bought by cities on these specifications, and other cities adopted the specifications without themselves procuring a standard rattler.

Bricks subjected to this process lose from 15 per cent. in the very best and toughest varieties up to 30 per cent. with an ordinary soft or No. 2 paver. The limits set by various engineers, beyond which they would reject materials, run from 22½ to 27½ per cent. of loss.

—The University of Illinois Test.—

Prof. A. N. Talbot, of the University of Illinois, who had experimented with this process, published a criticism of the N. B. M. A. method, basing his objection principally on the point that the abrasive effect of brick on brick was not sufficiently differentiated in the case of hard vs. soft bricks. Prof. Talbot thought that a soft, tough brick, of no value as a paver, would often wear as well in the rattler as a hard or vitreous brick, of known value and reputation as a paving material. He had used since 1895, for a 24x36-inch rattler standard, abrasive material composed of about 350 pounds of cast-iron shot in two sizes, weighing roughly about one and eight pounds, respectively, half of the weight being composed of each size, and considered that this method gave more discriminating and trustworthy results. He gave the tests of four different bricks, using a 24x36-inch rattler, in charges with and without shot, which tended to show that this iron charge occasioned heavier wear with a soft brick than was occasioned by the wear of these same bricks on each other. Professor Talbot's results were early corroborated by Mr. W. S. Purington, of Galesburg, Ill., working with a rattler of standard dimensions.

The commission of the National Brick Manufacturers' Association had experimented on the use of iron abrasives as well as stone as components of a rattler charge, but had tried charges composed of only iron masses of seven and one-half pounds, which were too severe, and small masses of eight to twelve ounces, which were ineffective. The combination of large and small masses, which Professor Talbot found effective, had not been tried by them.

—The Jones Process.—

In February, 1899, Mr. Gomer Jones, of Geneva, N. Y., read a paper before the Thirteenth Annual Convention of the National Brick Manufacturers' Association, at Columbus, O., describing a new machine for testing paving brick. In Mr. Jones's process the bricks were clamped on edge in pockets in hollow cast-iron staves, which were bolted to the circumference of a pair of twenty-four-inch cast-iron discs, thus making a brick-lined cylinder. Into this chamber a charge of 150 pounds of one and one-and-a-half-inch cast-iron cubes was placed and driven 3,000 revolutions at a speed of twenty-five per minute. Mr. Jones claimed many advantages for this process, the chief being that it gave the bricks the same kind of wear they actually received in the street, and gave results easily translated into wear per square yard of pavement, and also that the wear was more uniform and comparable than in the other tests.

The essential difference in principle between this process and the two preceding lay in the fact that in this but one surface was exposed to action and in the two earlier processes all sides were worn at once. Also, the abrasion was between that of brick and brick in the first process, brick and a mixed charge of large and small shot in the second, and a charge of small shot in the third process.

—Comparison of the Three Processes.—

The two later processes, i. e., those of Talbot and Jones, were both received with more or less favor by brickmakers and brick users. In order to settle the relative merits of the three processes an investigation was begun under the auspices of a committee of some fifteen paving-brick manufacturers, but the final title to the work was acquired by the National Brick Manufacturers' Association, which assumed the expense of completing the work from the point where the manufacturers' committee stopped. The execution of the work throughout was in the hands of Prof. Edward Orton, Jr., of the Ohio State University.

The comparative test was begun in April, 1899, and com-

pleted in January, 1900, costing about $500. On its completion, the President of the Association appointed a committee of seven to receive and revise Professor Orton's report and to make recommendations to the Association as to what course it should take in the matter. The personnel of this committee was as follows:

Prof. J. B. Johnson, dean of the College of Engineering, University of Wisconsin, chairman; Prof. A. N. Talbot, Department Municipal and Sanitary Engineering, University of Illinois, secretary; Prof. H. A. Wheeler, mining engineer, and manager of the Standard Tile Company, St. Louis, Mo.; Mr. Gomer Jones, M. E., formerly City Engineer of Geneva, N. Y.; Mr. D. V. Purington, president of the Purington Paving Brick Company, Galesburg, Ill.; Mr. J. H. Higley, paving brick manufacturer, Canton, O.; Prof. Edward Orton, Jr., Department of Clayworking and Ceramics, Ohio State University.

The committee met in Chicago, Jan. 27, 1900, and, after carefully reviewing the data submitted by Professor Orton and by the other members of the committee, framed a report, of which the following is an abstract:

First—The committee found that, as between the present standard test of the National Brick Manufacturers' Association and the University of Illinois test, the latter is more sensitive in selecting the soft brick and also gives much more uniform results, thus confirming Professor Talbot's principal contention.

Second—The Jones test gives more accordant or uniform results for any given make of brick, and is distinctly more sensitive in indicating the softer grades of brick than either of the other processes; but, as now designed, it embodies objectionable features which prevent its present acceptance as a standard process.

Third—The committee recommended that experiments and alterations should be made in the construction of the Jones machine, with a view to avoiding the present defects, and that the remodeled machine should be again submitted to Professor Orton for a comparative trial, he to submit his findings to the National Brick Manufacturers' Association or to a committee appointed by it, as in the present instance.

Fourth—The committee recommended that, pending the completion of these experiments, the conclusion of which is uncertain, the present standard method of the Association shall be amended on the following points:

(a) The brick shall be thoroughly dried before rattling.

(b) Steel staves shall preferably be used in place of cast iron, as the latter peans and ultimately breaks under the wearing action of the charge.

(c) That the speed shall be between twenty-eight and thirty revolutions.

(d) That the charge shall consist of from nine paving blocks to twelve paving bricks, together with 300 pounds of shot, as described below.

This report was duly transmitted to the Detroit Convention and was accepted and ratified by the Association. Furthermore, provisions were made to continue the testing of the other processes in the future as they might be brought before the Committee on Technical Investigation, so that the Association is now fully committed to the policy of keeping its standard abreast of the times.

The following is a full text of the method as it stands since amendment:

—National Brick Manufacturers' Association Specifications for a Standard Method of Conducting the Rattler Test for Paving Brick.—

I. Dimensions of the Machine.—The standard machine shall be twenty-eight inches in diameter and twenty inches in length, measured inside the rattling chamber.

Other machines may be used, varying in diameter between twenty-six and thirty inches and in length from eighteen to twenty-four inches, but if this is done a record of it must be attached to official report. Long rattlers may be cut up into sections of suitable length by the insertion of an iron diaphragm at the proper point.

II. Construction of the Machine.—The barrel shall be supported on trunnions at either end; in no case shall a shaft pass through the rattling chamber. The cross-section of the barrel shall be a regular polygon, having fourteen sides. The heads shall be composed of gray cast iron, not chilled or case-hardened. The staves shall preferably be composed of steel plates, as cast iron peans and ultimately breaks under the wearing action on the inside. There shall be a space of one-fourth of an inch between the staves for the escape of dust and small pieces of waste. Other machines may be used having from twelve to sixteen staves, with openings from one-eighth to three-eighths of an inch between staves, but if this is done a record of it must be attached to the official report of the test.

III. Composition of the Charge.—All tests must be executed on charges containing but one make of brick or block at a time. The charge shall consist of nine paving blocks or twelve paving bricks, together with three hundred pounds of shot made of ordinary machinery cast iron. This shot shall be of two sizes, as described below, and the shot charge shall be composed of one-fourth (seventy-five pounds) of the larger size and three-fourths (225 pounds) of the smaller size.

IV. Size of the Shot.—The larger size shall weigh about seven and one-half pounds and be about two and one-half (2½) inches square and four and one-half (4½) inches long, with slightly rounded edges. The smaller size shall be cube of one and one-half (1½) inches on a side, with rounded edges. The individual shot shall be replaced by new ones when they have lost one-tenth of their original weight.

V. Revolutions of the Charge.—The number of revolutions of a standard test shall be 1,800, and the speed of rotation shall not fall below twenty-eight nor exceed thirty per minute. The belt power shall be sufficient to rotate the rattler at the same speed whether charged or empty.

VI. Condition of the Charge.—The bricks composing a charge shall be thoroughly dried before making the test.

VII. The Calculation of the Results.—The loss shall be calculated in per cents. of the weight of the dry brick composing the charge, and no result shall be considered as official unless it is the average of two distinct and complete tests, made on separate charges of brick.

NECESSITY OF GOOD ROADS.

Friend Randall—Your annual circular has just reached us, and, feeling grateful for past kindness, we cheerfully respond to your request, and shall contribute our mite, that you may be encouraged to prosecute the good work in behalf of the clay industry.

Personally, we can lay no claim to practical clayworking; still, we have manfully battled the past six years to bring about conditions that would warrant us in embarking in the serious undertaking of converting a valuable clay deposit into commercial products.

Nevertheless, through the assistance of The Clay-Worker and other trade journals, we are made wiser, if not better, for the knowledge gained by their teachings and kindly advice, as we have the assurance that we can erect and equip an up-to-date brick plant for one-third less money than we could have accomplished at the commencement of the investigation. A goodly portion of past life has been devoted to the consideration of the all-important subject of improving our country roads, and, being firmly grounded in the belief that clay is the best material, it became incumbent upon us to enlist the clayworkers in the development of this grand task of making country hard roads a possibility.

Right here we desire to thank them for the interest they manifested in passing the resolutions at the annual Convention in 1898, and they will earn my warmest gratitude if, at their coming Convention, they would promulgate some plan whereby this vitrified clay wheel track can be brought to a practical test, thereby enabling the inventor to demonstrate its practical utility. Experience and observation has convinced the writer that the average person has not the least conception of the coming possibilities resulting from improved highways. Not least among the economical results (so frequently referred to by the friends of good roads) would be the great social expansion of the body politic, and privileges that the bread-winners are now deprived of would occur to every neighborhood, especially to those overpopulated districts in our large cities. The clayworkers can advance these methods of improvement more rapidly than any other class, and we have faith that they will come to see it in the light of a duty, for as sure as night folows day will good roads bless and prosper this nation.

Janesville, Wis. O. L. DE FOREST.

Written for THE CLAY-WORKER.

THE NEW YORK BRICK MARKET.

IN A COMMUNICATION about the supply of clay for the yards in Haverstraw, I said that there was more in sight than at any previous period since the clay banks of that place were first opened. Probably many thought that was a long shot, not giving thought to the removal of clay and sand, or not having any idea of the formation or judging by other clay formations with which they were familiar.

The sand problem was a source of trouble to the brickmaker up to about 25 years ago—that is, how to keep it clear of the clay. Taking the yard level as a basis, the clay bank of the yard would average at least fifteen feet in height, with at least the same number of feet of sand on top, and in many banks a greater depth of sand. The surplus would be carted off. As years went by and the top bank was worked back, and they sunk for the clay, the sand question ceased to be troublesome. As the face of the clay bank became double the height, and as years passed along, more clay was exposed as they sank deeper, till the sand question again became a troublesome matter—where to get it became the leading quesion. There was no yard that had any to spare, so from too much sand it was not enough, and they had to go outside and buy it and have it brought by boats.

The removal of the sand and the sinking deeper for clay exposed more of that material than had ever been in sight before. At that time I said that, when the clay was all used up in the banks, they would and could take it out of the river.

The first step toward making the river bed pay tribute to the manufacture of brick was made on the De Noyelles property, at the south of town. The amount of clay taken off that property has been very large. As clay does not grow, the time came when, if they expected to lease the yards, they must take measures to open a bank along the shore.

How to do it was the question, and when one looks at the method employed, and it is only about fifteen years ago since they opened the bank, it would seem that they had not given the matter much thought, but accepted the first idea that came up. It was the longest water front of any property in that town. There was a long stretch where there were no yards. On this front they drove two rows of spiles, about 10 feet apart; then bolted a piece of yellow pine, say 8 by 8, at low water mark, and another about 8 feet above it, and the same on the other spiles on the inside, then used three by any width of yellow pine planking sharpened at one end and driven down in the clay. It formed a cofferdam, and a good one. Like many other structures, it was not built large enough, did not reclaim enough of the river, and it was only a question of extending the sides, as the same front would answer. Pumps were set to work and the water removed. When once dry there has been no trouble with an accumulation of water. During the winter at regular intervals the water was removed. The cost of building the dam was about $15,000, which seems to be rather costly when pumping has to be continued. It would seem that they would have evolved a system that would take the clay out of the water, and have no more to do with it.

The next to make a try for the clay under the water of the Hudson was at Croton, directly across the river from the said dam. There was a large bank of sand, but no clay. Yards were built outside the Hudson river. A mud digger was the means used to bring the clay to the surface with good results.

The Excelsior Co., of Haverstraw, extended the dock line out in the river, and had the mud digger throw the clay on the dock. They made one or two kilns out of it with indifferent success on account of the silt mixed with it. This was a trial of the clay.

Another firm two years ago purchased a piece of property that had been used for a coalyard, on the same land the foundry of the late R. A. Vervalen was located. The water front would not exceed 500 feet, and had a water grant from the State extending to the channel bank. The property is but a short distance south of main street. At the time of purchase surprise was expressed that the parties would invest. It soon became known why the investment was made, not because there was a fine residence on it, which faced one of the finest residential streets in the town, on the river bank, nor for the location of any business on the property, but for the clay. Where is the clay, under the water? Yes; their yards are in the creek, about three miles by water from this property, and they try to make me believe that it is for the clay that they bought it. A fact. The creek property, as it is called, is at Grassy Point, and runs from the Hudson to Mineceongo creek. It was bought by them about 18 years ago, when all the clay was used up, so it was said. Still, the present season clay and sand has been taken off the same used-up property, but the end is near, and, with foresight that others in the trade seemed to lack, they bought about the only water front that was purchasable, with one exception, and that has only 100 feet front, and is not covered with a water front.

—Getting Clay to the Yards.—

They built a tight bulkhead on the shore of the creek, then drove spiles about 12 or 15 feet above the level of the ground, and put the ties and track on top of them, on which they have a small mud digger on wheels. The shovel part is built like an umbrella, which, when dropped, opens from its own weight, sinks in the clay in the boat which lies along side, and when the strain is put on by steam, up it comes full of good solid blue clay. It is then swung over the track and dumped to lay there and dry out.

Many, no doubt, will ask, does it pay? Beyond a doubt, the cost was well considered before any move was made toward the purchase of the land, and the more clay that is taken out the depth of water will be increased, thereby making the dock property more valuable for a manufacturing site. A deep draught vessel can then be gotten to the dock, as at present seven feet of water is all that is available. Water deep enough to float an ocean greyhound is possible.

D. Flower & Son, the present season, were the last ones to take clay from the river bottoms. In time others will have to follow the ones I have mentioned.

The Way It Is Done—Of the many readers of The Clay-Worker, few are conversant with the location of the yards. The many changes which have taken place by the removal of clay and sand has, as in the case of D. Fowler & Son, completely removed all existing landmarks which surrounded the yard

Handy as a pocket in a shirt is an old saying. The Messrs. Fowler have planned the handling of the clay so that some of the pits can be filled with wheelbarrows if they think best. They have a tressel built on an incline of probably less than 45 degrees. On it a railroad with dump cars run up from the boat which holds the clay taken from the river. The power to hoist and run it is located under the tressel work. It is steam taken from the boilers which run the yard. The removal of the clay at the edge of the river virtually makes it part of the Hudson river. When the digger fills the boat she is floated in and the clay loaded on the cars, run up the incline and dumped. Sufficient quantity can be stored in the spring to last the season. As the sand has been used up on the property as well as the clay, they use one of their old boats to bring it from the banks further up the river. The same as with the clay boat, the sand vessel is brought in and lays but a short space from the pit. A platform is built, so that a horse and cart can go aboard and load up. A quantity is kept on hand, to be taken from when the boat is unloaded and has gone for another load. No question, it is a perfect plant.

The Excelsior Co. loads its clay on dump cars from the boat at the end of a long incline, with more slope than the one before mentioned. The power to run the car up is an engine, with a drum to wind up the cable at the highest part of the tressel. They have any quantity of room to dump clay, so that if the company should wish, several seasons of clay could be taken from the river at one time.

The clay will be removed from the river bottom by the three parties not far apart. The Felter Bros. have to take their clay some distance to the yards.

Slides will be unknown, and there will be no recourse to the courts to try and get their own or some portion of it where your neighbor has dug close up to the line, knowing that he will be the gainer, even if he allows the owner of the slide to come on his property and remove it after engineers have taken measures of the slide.

Extra pumping will cease on these yards, as the river clay can be taken as soon as the ice is off the flats. If there is any to be done, after the yards are running the water can be taken out.

The cost of having a mud digger come and take clay out would be more if only one yard was getting clay that way. As three will require its services, it will be work for the

machine, as they can deepen the water as they go along, it will not require a wait for the tide to raise. If the clay could be taken off the boats as fast as the digger could load it, it would take but a few days to get the amount needed for a season's work. The two yards on the river front used the cars of the plant at Croton, and were found not to be well adapted. They expect to improve on them. If the plan works well, as is looked for, there will not be the detention from breaks that they had to contend with the past spring. The cost per yard of getting from the river and placing it on land ready to put in the pit is, if everything works well, about 12 cents per cubic yard, which does not make it expensive material. The present season it cost more than that figure, and the cost may reach more than that, but not likely.

The yards which have to have their boats towed over two, or, I may safely say, three miles, will be handicapped with the tide, as the tug boats and loaded scows cannot get in the creek only at high tide, and towage will be more.

A gift, and it can only be called that, of all the clay contained under the water covered by the water grant for which they did not have to pay anything, only the cost of a lawyer to draw the application to the State government for the right to the land under the water from low water mark to the channel bank. The width of the flats at that point is about the widest along the whole shore. At least in two of the cases five or six hundred feet front, and over a quarter of a mile from low water mark to channel bank, with about from six to seven feet of water at high tide at the dock to eight or nine at the channel line. It is not often that men, especially men in the brick trade, are favored with such a gift . All cost of getting, when compared with the high banks on land up the Hudson, is met by the cost of towing the burnt brick the longer distance.

The brick market moves along at the usual gait. The shipment was stopped for a time by the ice, but at present the market can get all it requires. As each day is nearer spring no fancy price is in sight, and the market remains the same.

A. N. OLDTIMER.

REGARDING THE BERG PRESS PATENTS.

In connection with the claim of the Chisholm, Boyd & White Co. that our Berg press is an infringement on their patents, we beg to submit the following letter from Mr. B. C. White, who has been connected with the Chisholm, Boyd & White Co. ever since its organization, and was its president until early in 1898. Furthermore, Mr. White is the inventor and designer of all the Boyd presses, and all patents under which the Boyd machines are built were issued to him, or to him and Mr. Boyd jointly:

Sept. 30, 1899.

John J. Moroney, 225 Dearborn street, Chicago:

Dear Sir—I have carefully examined the Berg brick press, built by you, and have compared it with all the patents pertaining to brick presses issued to B. C. White, and to J. A. Boyd and B. C. White jointly. All of the above patents are owned by the Chisholm, Boyd & White Co., and comprise the only brick press patents owned by said company up to January, 1898. The Boyd brick presses are built under these patents.

I do not find that the Berg press infringes any claim of any of the above patents, and I see no way in which a suit against the Berg press or its builders or users could be successfully maintained by the owners of the White or Boyd & White patents.

In making this statement I take into consideration the prior state of the art, whereby a number of the claims allowed to White & Boyd and to White are limited to such an extent that they do not cover your machine.

The Boyd brick presses are all machines of my own design and invention in every important particular.

In conducting a long patent litigation involving these patents, I made a thorough examination of all patents relating to brick presses, and am therefore qualified to make the above statements without fear of successful contradiction. I am, yours truly,

(Signed) B. C. WHITE.

The above should be conclusive as to the matter of patents. Mr. White is one of the best mechanics in this country, and is more familiar with the patents on dry press brick machaines than any other one man in the United States. His opinion as to the Berg press patents is upheld by the foremost patent attorneys in Chicago and Cincinnati, who carefully examined and compared the patents. We satisfied ourselves thoroughly on this point before undertaking the sale of the Berg press in 1897.

The Chisholm, Boyd & White Co. are fully aware of the above facts. We do not believe in trying a case in the newspapers, but as that company sent a notice of the suit to all of the clay journals, with a request for its publication, we feel that it is only justice to ourselves, to the Berg press, and to the Anderson Foundry and Machine Works, who are now building this machine, that we publish the above letter. We also wish to assure all customers, both present and prospective, that they will be fully protected in the purchase and use of the Berg press.

CHICAGO BRICK MACHINERY CO.,
By John J. Moroney.

FROM UP IN MAINE.

FROM END TO END of the Pine Tree State the heralds of spring bring words of hope and cheer to the hearts of the clayworkers. Brick are bound to be in great demand the coming year, and the demand has already begun. Wm. H. Grady, Esq., of the firm of John Grady & Son, contractors, who are laying the foundation of a large pulp and paper mill at Fairfield, on the Kennebec river, has traveled all over the State seeking for possible brick supplies to meet the demand. In every locality he found a shortage, and in a majority of the localities he found a total dearth of brick.

The pulp mill fever is still rising, and that means a continuous rising of the demand for the brickyards' output. The latest is a plan for the erection of a gigantic pulp and paper mill in the Fish river region, the northernmost territory in the State of Maine, a locality covered by the densest forests, broken only in small spots by the little clearings of the Frenchmen's home sites. Millions of brick will be required to carry it out, and the nearest brickyards is thirty miles south, at Ashland, where Dan Mullen has a yard of about one million capacity. But Maine is mostly clay, and the chances are that some enterprising clayworker will find here an opportunity to increase the number of brickyards in the State, and also the size of his own exchequer.

More kiln wood has been cut and hauled into the yards of Maine this year than ever before, and it would seem that the manufacturers are bound to make an effort to keep up as well as they may with the demand, something not a prominent feature of their conduct in the past.

As to the opening prices, it is hard to say. Maine brickmakers have been so accustomed to selling below cost that when they find the price going above the cost of production they stand in awe at the spectacle, and look upon it as if it were a dream too good to be true.

There are not three million brick for sale to-day in the State of Maine. There will be a demand for not less than twelve million brick in Maine by the time the readers of The Clay-Worker see this, and new brick will at that time be still two months away. And yet it is safe to wager that the price of brick will not go far above seven dollars a thousand at the start, nor at any stage of the programme. One reason is that the Maine brick manufacturer is satisfied perfectly with the business horizon from his own yard. If the State were better represented at gatherings of manufacturers like the National Brick Manufacturers Association there would be more money in the pockets of the manufacturers and more reliability in the markets to the eyes of all. S. J. C.

THE NEWELL CRUSHER.

The attention of brickmakers and others is called to the advertisement, found on page 303 of this paper, of the "Newell Crusher," so long and favorably known to the brickmakers of this country.

This crusher is used in all sorts of brick, tile and terra cotta works, and crushes successfully all varieties of clay, preparing same in the best possible manner for further treatment.

This crusher stands high in the regard of the clayworking industry in this country, and the manufacturers write us they have shipped crushers to Great Britain, Germany and France, which speaks well for their national reputation and the regard in which they are held abroad.

They are made in five sizes, and therefore adapted to most any capacity, and the manufacturers are endeavoring to turn out the best possible construction for the least money. Intending purchasers of this class of machinery should communicate with the Duplex Heating and Machine Company, 534 West Twenty-second street, New York, who are the only manufacturers and sellers of this valuable machine.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

The Chicago Situation.

Editor Clay-Worker:

How not to do business is the all prevailing topic for Chicago in industrial lines. The controversy between capital and labor is on full head, and with the advent of open weather, will find the warring factions determined that neither shall win out. An occasional fight keeps up the interest, although the casualties so far, with one exception, are on the side of the nonunion men. The exception is the case of an overenthusiastic young man who stopped a bullet from the pistol of the superintendent of the Link Belt Machinery Co. If one has a taste for war, he need not go to South Africa or the Philippines, simply hang around one of the few buildings in process of construction, and if he is a good dodger, he can have lots of fun. While all this may interest the unions and contractors, it is hardly appreciated by the material man, as their action of the 6th inst. proves. Fifty-nine firms met in the Builders' and Traders' Exchange rooms and agreed to suspend business until the settlement of the labor troubles, as the cost of operation under existing conditions greatly exceeds the profits. As some $20,000,000 of capital is represented in the above firms, the gravity of the situation may be realized. On the same day the bricklayers' and stonemasons' union imposed a $500 fine each against 69 contractors, who were guilty of employing nonunion labor. These "fines" could hardly be considered as available assets of the unions, as the retail merchants and landlords during the past week have protested against being made a party to the scheme of the union leaders, and the next week will see a curtailment of credits and possibly a move towards cheaper quarters for hundreds of families, as the aforesaid merchants and landlords maintain that if their customers can afford to keep a strike alive for several months, they can afford to pay their bills.

Ultimatums and defies are issued with pleasing regularity by the building contractors' council, building trades' council and the independents. General Falkenanfonstein directs the contractors' forces from the kopje, northwest corner La Salle and Washington streets; General Motschman-Huichliff, for the independents, marshals his forces at the kraal, 161 La Salle street. Brig. Gen. Carroll-Gubbins-Woodbury, who occupies Harrison's nek, keeps the union side of the question hot. The only mutual point of attack for the three factions is the "laager," at Old Quincy Number Nine. The civic federation made an attempt to settle matters and gracefully retired with burned fingers. We have yet to hear from the Y. M. C. A. and the W. C. T. U. VERITAS.

Chicago, Ill., March 12.

Local Organization Proves Profitable and Pleasant.

Publishers Clay-Worker:

Please accept the inclosed and put it in your pocket and don't say anything about it. If it is any more just let me know. I will not make any excuse as to why I did not send it before.

In regard to business, it has been very good. The sales might have been a good deal better, but we are getting a good price for what we do sell.

We have had an association the last three years; there are six of us in it, two of whom are both contractors and brickmakers, but they do not sell many to builders.

Our plan of association is this: We appoint one of our brickmakers agent, he keeping his yard closed. We pay him a commission of so much per thousand, so that he makes as much a year as we do. One yard we buy a limited quantity of outright, as we had difficulty in getting them to join us, so that was one way out of it. Another yard, a small one, we pay a yearly rent for and keep it closed.

As I have said we keep together and have had fairly good prices. At the present time we are getting $7 per thousand for kiln run, $7.50 for face brick, so you see it pays to be together. No matter what it costs, it pays to be together. We have no trouble. We have it so arranged that we can get our money on the fifteenth of each month in full, for all brick delivered the previous month. Our agent does all the selling and collecting, we regulating the prices. Although our agent is one of us, he is liable to his share of all losses and his share of expenses; he also has a vote with us, but he is subject to our orders and we find we get along all right.

We could have had our work done cheaper, but thought it best to have one of our own men do it, as he would be more satisfactory than an outsider.

I would advise all brickmakers, no matter how many are in the business in a locality, whether two or fifty, to do the same. It will pay them in every move they make. With best wishes, I am, very respectfully, A CANADIAN READER.

P. S.—I forgot to thank you for your kind invitation to meet with your National Association in Detroit. I hoped to be able to meet with you at some future time. The next best thing, I follow all your proceedings in your valuable paper. Cannot see how a brickmaker can get along without the Clay-Worker. I think the Bible and the Clay-Worker are the two best educators for the brickmaker.

Time and Money well Spent.

Dear Mr. Randall:

I have received the February Clay-Worker, and it is just the thing, and will serve to give the poor unfortunates who could not, or would not, avail themselves of the opportunity of a lifetime some idea of what they missed in not attending the Convention. To say that I enjoyed the whole trip, from start to finish, is poor praise, and to say nothing but a shortness in the bank account will ever prevent my future attendance is a simple statement of actual fact. I am like our friend, the treasurer, Mr. Sibley, I would not miss a meeting of the association for anything in reason, and I wish to thank you for your kindness and courteous treatment while there. I have not fully examined the Clay-Worker yet, but as far as I have noticed there are no errors in typography, but if I find any will send notice of same. The photograph came duly to hand, and I have already been complimented on my picture in the Clay-Worker, so conclude your artist must have flattered me a little in his copying.

In conclusion, I assure you I am most fully repaid for my time and money invested in the Detroit visit, and my recollections of it are all of the most pleasant character. Very truly yours, J. R. COPELAND.

Birmingham, Ala., March 5.

Grate Bars or no Grate Bars.

Editor CLAY-WORKER:

Kindly permit me to call the attention of your progressive readers to some very practical remarks made at the late Brickmakers' Convention at Ottawa, Ill. The subject I refer to, and that has suggested these thoughts, was, "Grate Bars or No Grate Bars."

I have read with interest and profit the clear and convincing statements made by gentlemen of experience on the above subject. The views expressed were quite unanimous in favor of grateless furnaces. In the use of such furnaces they emphasized the importance of strong draft. The necessity of strong draft was declared to be essential in order to prevent "clinkering," and to carry the heat into the kiln and away from the fireman. All heat discharged outside of the kiln is so much heat wasted, and hence the supreme importance of sufficient draft and properly constructed furnaces to prevent this. After the watersmoking is well-nigh finished no cold air should be permitted to enter the kiln. All air should pass through the body of hot coals before entering the kiln, and only so much of this as is necessary for complete combustion.

One speaker stated that "clinkering," in such cases, required to be done every three hours, and in doing this where grates were used an amount of cold air entered the kiln through the open door of the furnace sufficient to so chill the heat in the kiln as to require about two hours to restore the heat to the burning point. This is something like taking

three steps forward and two back, making a net gain of one in three, where the gain should be three in three.

Now, this seems extravagant, but I believe the gentleman's remarks were close to facts, and the evil he mentioned can only be avoided by constructing grateless furnaces so designed that the rustling never interferes with the feeding, and neither permits cold air to enter the kiln. It was said truthfully that strong draft was very desirable. We may add that this is true for three reasons: First, it is important in facilitating watersmoking; second, it is essential in order to perfect combustion and the consuming of a large percentage of smoke; third, it gives means to control the draft at certain stages of the burning, and this has some effect on the color of the brick when burned.

When I recommend a grateless furnace I do not mean such as have been used in former years, chiefly in the kilns used for burning fire brick. These were but little more than a large hole in the wall of the kiln; but I do refer to a grateless furnace so constructed that the rustling and firing are in separate parts of the furnace, and neither admits cold air into the kiln.

The admitted need of strong draft brought up the subject of chimneys, their area, height, etc. Much was said on this subject. and some things that were not quite clear to the comprehension of one so unlearned as the writer. One brother, who claimed to be an adept in such things, said: "It was not a question of small stack or tall stack to create draft." The power of stack, short or tall, was affected by certain conditions, he said, such as the velocity of cold air, in feet, entering the furnace per second, and the velocity of hot air in feet per second leaving the chimney top. But I can't go through the list of conditions, so refer your readers to the excellent table on page 36 of the January, 1900, Clay-Worker. The gentleman should not be understood as saying, other things being equal, the height of the stack did not affect the draft. It is very true that a hot chimney or stack will increase the draft, but if the hot chimney is at the expense of fuel it is not desirable. It is true that height of stack, as a general rule, governs the draft they have, but if certain conditions independent of the stack can be employed by which a forty-foot stack will have a draft equal to an eighty-foot stack, it would be folly and a waste of means to build the higher stack. For proof on this point let me say that last summer, for a round down-draft kiln, I furnished the plans containing the draft conditions. I sent these to the gentleman by mail. (I have never seen him.) He is and has been for many years a reader of The Clay-Worker, and his letters to me showed this, because they were instructive, intelligent and clear. Well, he built the kiln according to the plans and has burned it five times, requiring from four and a half to five days from the time the fires are started until the kiln was closed.

He informs me that he has a draft from the start, notwithstanding the green brick, cold bottom and cold stack, and when his kiln is hot and the damper open you can hear the kiln roar thirty rods away. I should say his stack is forty-two feet high. He is making a red sand-molded brick, and his object in using a down-draft kiln is to have a good red color and a large percentage of first-class brick. This cannot be had in the open-top up-draft kiln. He speaks of the satisfactory working of his kiln in language stronger than my modesty will justify me in mentioning. I furnished the plans, and they contain but one of the important principles of my up and down-draft kiln. J. K. CALDWELL.

From the Far Northeast.

Editor CLAY-WORKER:

I am happy to inform you that I landed here right side up after a journey of about 1,500 miles. I think that is about what it is from Detroit. Anyhow, it was a tedious old ride, especially this end of it. I must admit that traveling by rail on the Island of Cape Breton is far short of a luxury.

The Sidneys are busy places just now, as there is a big iron works in course of erection, known as the Dominion Iron and Steel Co. They are building blast furnaces and coke ovens on a large scale, consequently they are using a large amount of brick, all of which have to be shipped in. I understand the fire brick are coming from Great Britain, and the common brick they are getting them wherever they can, so I think the brick industry will be good here for some time. There are a number of frame buildings going up in Sidney which would be brick if they could get them. Up to now Sidney has but very few brick buildings.

The Cape Breton Manufacturing and Development Co. are going to start a yard just as soon as the weather will permit. They are putting in a Monarch machine of forty thousand capacity, and everything else up to date for a summer season yard. They also contemplate going into the paving brick and tile business, so the manager, Mr. R. S. Hodging, told me. He also informed me that he had contracted with the Dominion Iron and Steel Co. for nearly the entire season's output. All I have seen in this vicinity up to now in the shape of a brickyard was a very crude affair about eleven miles out from Sidney. From what I could see, the last kiln they burned held about 40,000, so you see they did not intend to flood the market. GEO. E. DERRY.

Busy Times in the Far Northwest.

Publishers Clay-Worker:

Inclosed please find check for $2 subscription for the Clay-Worker for 1900.

Last year was a fairly successful one with us, and we again expect a good season, although at present it don't look as if there would be as much building as last.

The Convention number of the Clay-Worker just at hand. It is a daisy. Detroit and the whole State of Michigan did themselves proud by the hospitality which they extended to the fraternity. I feel (coming down draft on Scripture), "Inasmuch as they have done it unto the greatest of these my brethren they have done it unto me."

The brickmakers of this city have all been extending and strengthening their lines and there is talk of one or two new yards, which will certainly keep the supply ahead of the procession.

Wishing your journal a still fuller measure of the success which it enjoys, I am, yours truly, J. T. DAVIE.

From Way Down South in Dixie.

Dear Mr. Randall:

Although too late for your Convention number, I feel like testifying to my experience as a freshman at your Convention; which is such, that, although located way down in "Dixie," I was so agreeably surprised that I shall endeavor to put in regular attendance hereafter.

Not only from a business standpoint was I generously rewarded for this trip, but also socially was I highly delighted. While it has not been my good fortune to meet my fellowmen in convention often, I must say that the attendants at the N. B. M. A. at Detroit Convention were as fine and intelligent a body of men as any craft can produce.

Certainly, all honor and praise is due the Detroit brickmakers for their untiring efforts to make each and every one enjoy their short sojourn in their beautiful city. With best wishes, your friend F. SALMEN.

Slidell, La., March 14, 1900.

Cheaper to Build of Brick than Wood.

Publishers Clay-Worker:

Inclosed find check for $2 subscription for The Clay-Worker for 1900.

We are sorry that we could not be at the National Convention. We have been very busy the last year—could not begin to supply the demand. We are going to erect some kilns as soon as the weather will permit, and double our output this season. Think we will have fully as good a trade this year as last. At present prices it is cheaper to build brick than frame buildings, so we expect an increased trade in this direction.

Wishing you success in making The Clay-Worker better than ever, we remain, yours truly,

BUTLER BRICK & TILE CO., LTD.

Butler, Pa., March 6, 1900.

Don't Toss Your Brick—It's Expensive.

A "slick" and profitable device for handling brick into and out of kiln and into boats, etc., absolutely doing away with the pitching and catching of brick entirely, is embodied in what may be known as the Eureka Brick Elevator, made in four styles, from the best material and workmanship, which is proving very satisfactory wherever introduced. It is illustrated on page 299. Once adopted, this system is a continual consolation and a good investment. This is the verdict of all its users since 1890 to date. It earns good money for the user, and is a helping aid and practical assistant to the brickmaker. From their own words of testimony, they are "suited to perfection," attested to and certified in black and white. The proof of the pudding is in the eating of it. Write for particulars, and learn of its merits, advantages, benefits and profits to you as a money maker. Address A. C. Newton, manufacturing patentee, Crescent, N. Y.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIII. MARCH, 1900. No. 3.

CURRENT COMMENT.

We expected to include in this issue a full report of the Ohio State Convention, but the stenographer was unable to complete the work in time, so it cannot be given till next month.

* * *

The report of the Iowa convention will be found quite interesting. As usual The Clay-Worker publishes the most complete account of that meeting, thanks to our able contributor, D. W. Stookey, who, we are pleased to note, was honored by election to the vice presidency.

* * *

One of the absentees writes: "I know I missed a rare opportunity in not attending the Detroit convention, but am in a large measure compensated by the full report in The Clay-Worker, compared with which the other trade papers are far behind." We appreciate the compliment, and likewise the fact that it is deserved.

* * *

Our correspondent, and those like him, who depend on the report of the convention, misses a vast amount of practical information, that which is passed from hand to hand, as it were, in the lobby talks and which can never be recorded by any reporter, however diligent. The printed records of the convention are valuable, very valuable, but they contain only a small part of the knowledge that is imparted at all these yearly gatherings.

* * *

It is in the lobby talks that the "silent member" finds his voice. Not infrequently the silent member is possessed of just the information that is needed to turn failure into success, and this he most cheerfully imparts on the quiet, but will not do so for love nor money on the floor of the convention. If asked for an opinion in the convention hall he will beg to be excused, but in the lobby talks cannot be suppressed. For this reason, those who con the printed reports and say, "This is interesting reading but there is little of practical value in it all," and conclude that the talk of the importance of convention work is talk and nothing more, are deceiving themselves and neglecting valuable opportunities.

A FINE PICTURE.

A very pleasant remembrance of a very pleasant time comes to us in the form of the group picture of the members of the N. B. M. A., taken in front of the Hotel Cadillac. Though many of the faces of the faithful are missing, fully one-half of those in attendance are included in the group, and almost every face is clear and distinct. Those who neglected to order a print, or those who have failed to receive the copy ordered, if any there be, are requested to address C. M. Hayes & Co., photographers, Detroit, Mich.

As we gaze at the picture the thought comes to us, How would a similar picture of an equal number of brickmakers of thirty years ago compare with this, could it have been taken? Those comprising this group are prepossessing in appearance, so much so that they could easily be taken for a body of professional men. How would it have been with the past generation of brickmakers? They were men of brawn, sturdy pioneers, who, though deserving of all praise for their sterling qualities, were handicapped by want of education—technical knowledge, if you please. Thirty years ago brickmaking was a roadside industry. Now it is a great manufacturing business, requiring as much skill and mental acuteness as any of the professions. Judging from the picture of the members of the N. B. M. A., it is in safe hands, and will go forward with the best industrial progress of the world.

BRICK PAVEMENTS GROWING IN FAVOR AND MUST TAKE A LEADING POSITION.

The above expression is the essence of the able article on Good Roads, which is given the place of honor (the first reading page) in this issue. The author, Mr. Geo. W. Tillson, is a distinguished engineer of New York city, and his opinions will have much weight with the engineering fraternity throughout the country, to whom he is well known. His article will be read with more than ordinary interest we are sure. We commend particularly the closing paragraphs of this, the first of the series of papers which Mr. Tillson has prepared especially for the columns of The Clay-Worker. They are well worth repeating.

"The accompanying cut (page 235) was made from a picture taken Oct. 28, 1899. It will be noticed that, besides the elevated railroad on the street, there are also two lines of surface tracks in the center. This drives all traffic to the brick between the tracks and the curb. The cut shows the condition of the pavement after severe use for eight years, with practically no repairs. No one can examine this street as it is to-day without being satisfied that a pavement properly laid of such material is adapted to almost any traffic, and under ordinary conditions cannot fail to give satisfactory results.

"Engineers are proverbially conservative. They do not wish to depart unnecessarily from precedent, and it is not to be wondered at that they have been slow to accept an artificial product until it has been proved in actual practice, especially when, as in this case, the material is so far away as is the paving brick clay of the Central West. When brick was first used in pavements the writer had very little confidence in its success. But the results obtained in the cities where it has been used must convince the most skeptical that brick has not only come to stay as a paving material, and that it has not only correctly solved the pavement problem in interior cities far from natural stone, but that it has proven itself to be the proper thing for all cities.

"Many brickmakers are willing to place their product in competition with any material on streets of the heaviest traffic, and certainly some results will justify them. But in

streets of moderate traffic, where the property owners wish a smooth, clean and durable pavement, it does seem to be just what is to be desired. The borough of Manhattan, New York city, is laid out with its great arteries of travel running north and south. It is crossed by streets sixty feet in width, with blocks two hundred feet wide, where the traffic is moderate. This would seem to be the ideal place for brick pavements. The action of the elements will be nil, they can be easily kept clean, they are sightly to the eye, the cost of repairs will be very slight, they maintain a smooth and even surface under wear, and their life will depend wholly upon the volume of the traffic. Granite blocks, as a rule, wear rough; asphalt, while smooth and pleasing, is acted upon by the climate and is expensive to maintain.

"In the era of automobiles and rubber tires which is about to open up, and is bound to create a revolution in city traffic, whose magnitude no one can exactly predict at the present time, but which will certainly reduce the wear of all pavements to a minimum, it does seem as if first class paving brick must take the leading position."

UP TO THEIR OLD TRICKS.

A journal, which is devoted to brickmaking and draws its substance from the representatives of that industry, should at least be considerate of an organization which has for its objects the advancement of that industry, and which includes among its members many of the most progressive and successful men engaged in the business. No one will deny that the N. B. M. A. is the dominant organization of the brickmakers of this country and, as such, it is certainly worthy of respectful consideration, especially from those who have profited by its work. No one is expected to accept all that it does without question or to applaud its every action, but it is expected that those who pretend to represent its proceedings will speak from knowledge and with truth.

Ignorant expressions where knowledge is easily obtainable is as culpable as untruth. One who speaks hastily, where haste is unavoidable, may be excused for inaccuracy, but one who utters false statements when facts are easily obtainable, places himself beyond the pale of decency. This is just what our juvenile Chicago contemporary has done in its pretended account of what occurred at Detroit in connection with the election of officers. It says:

> The annual election of officers was then taken up, and here was the great surprise of the week. Visitors generally had anticipated that the usual custom would be followed, and Detroit honored with the presidency. In fact, Mr. George H. Clippert had been selected by the Detroit manufacturers for this honor, and as the visitors arrived early in the week Mr. Clippert was introduced as "our next president."
>
> A sudden change was made in the programme by some "unseen power" willing that Detroit was not to be so honored. But to defeat Mr. Clippert in open contest was not the method selected. Some "leading members" of the association called upon Mr. Clippert and coolly asked him to make the nominating speech for Mr. W. D. Gates, of Chicago, for the presidency, and Mr. Clippert courteously stated that he would do so.

This is pure, unadulterated fiction. There is not a word of truth in it, nor the least excuse for any such utterance. The real facts are that Mr. Clippert was urged to accept the presidency because it was known to all interested that he was exceptionally well qualified for the office. For reasons of his own he declined the honor with a firmness characteristic of a strong man and of his own choice nominated the gentleman who was elected.

That a journal claiming respectability should stoop to such petty meanness and utter palpable falsehoods, where the truth would surely serve a better purpose, is well nigh incomprehensible. When we read such things we are constrained to believe that the publishers of Brick are degenerates. They evidently need a guardian or some restraining influence to prevent them from following in the footsteps of their renowned predecessor, Charles T. Davis, who, by the way, is again in the toils of the law, having recently been sent to jail in New York city charged with complicity in a blackmailing scheme.

BY WAY OF COMPARISON.

Our German scribe sends us a translation of the programme of the German clayworkers' annual convention. We spread it before our readers, that they may see how it compares with that of our own national organization. It will be observed that our German brothers are wrestling with much the same problems as ourselves and are solving them through organized effort much as we are doing.

—Programme of the German Clayworkers' Convention.—

For the thirty-sixth convention of the German Clayware, Lime and Cement Association, held at Berlin Feb. 22 to 25, the following programme was arranged:

"Economic Value of Electric Haulage of Clays."
"The Patent Literature of the Past Year," by Dr. Hecht.
"To What Extent is Electric Power Used in the Brickyard?"
"The Advantages of Superheated Steam and Its Production."
"Notes on the Czerny Method of Dry Pressing," by J. Matern.
"New Improvement in Brickyard Machinery," by Schlickeysen.
"Experiments Made in Regard to Efflorescence," by Dr. Maeckler.
"Results Obtained from the Examination of Kiln Gases in Regard to Their Injurious Effect upon Vegetation," by E. Cramer.
"How Successful Has Been the Crownless Kiln of Bock?"
"What Advantages Are Offered by the Two-story Continuous Kiln?
"Notes on Gas Kiln," by Mendheim.
"The Combination of the Moeller-Pfeifer Tunnel Dryer and a Tunnel Kiln."
"The Latest Experience with Keller's System of Drying," by Meyer.
"How Much Does It Cost to Dry a Thousand Brick in a Modern Dryer?
"Description of a New Automatic Cutting Table for Roofing Tile," by Matern.
"A System Which Simplifies the Setting of Glazed Roofing Tile."
"What Shapes of Roofing Tile Are Best?" First, for plain buildings, not residences; second, for residences and fine buildings.
"Modern Metallurgical Apparatus for the Production of High Temperatures."
"Discussion of Several Brands of Fire Brick," by Hecht.
"Are Magnesite Brick Used for the Arches of Basic Martin Furnaces?"
"What Experience Has Been Had with the Drying of Plastic Clay in Lumps in the Cummer Dryer?"
"What Experience Has Been Had with Rotary Kilns for Burning Grog?"

The society has offered a price of $750 for anything which will remove efflorescence by treating either the green or the burned ware. The remedy must not injure the brick in any way, must not be injurious to the health of the workingmen, and must not cost more than one dollar per thousand brick.

A CHANGE OF BASE.

Our well-known contributor, J. W. Carson, has severed his connection with the Marion Brick Works to accept a position with The Columbus Face Brick Co., Columbus, O. Mr. Carson will take up his residence at Shawnee, O., where the brick works are located, and assume the duties of superintendent. Though he has had charge of the Montezuma plant of the M. B. W. for little more than a year he has in that time made many warm friends there, who regret his departure. The Montezuma plant has prospered under his care and the manager, Mr. F. W. Butterworth, was loath to lose him. On the eve of Mr. Carson's departure the gang of burners surrounded and presented him with a fine fountain pen as a reminder of their esteem. It is the wish of all who have been associated with him that the new position may prove as he anticipates, even more profitable and pleasant than the old one.

In a recent communication Mr. Hervey Haigh, superintendent of the Eastern Shale Brick Co., Catskill, N. Y., writes of the splendid Convention at Detroit, and closes his letter by saying: "Just a word about the report of the Convention. I never saw a more complete report gotten out than this one, and I realize that it represents a large amount of hard work, which, I must say, was well done. I thoroughly enjoyed my visit to Detroit, as I always do at these Conventions, and do not intend to miss one as long as I can get there and back."

TRADE LITERATURE.

THE CROSS OIL FILTER is a device that clayworkers who use any considerable quantity of lubricating oil will find a profitable investment. How this profit may be realized is fully explained in a little booklet which the manufacturers, The Burt Mfg. Co., Akron, O., will be pleased to send to any of our readers who write them for it. See ad. on page 284.

A VERY HANDSOME little booklet bears the imprint of D. J. C. Arnold, New London O., and tells in a brief but convincing way of the good qualities of the brick and tile yard supplies manufactured by that gentleman. The list includes everything needed about a brick or tile plant. Those who may want anything of the sort the coming season will do well to write for a copy. A postal card request will bring it.

1900 BRICK MACHINERY is the title of a new catalogue issued by the Wellington Machine Co., Wellington, O., which any of our readers may have for the asking. In it will be found some excellent views of the Monarch brick machines—they build several sizes—and also the "Iron Quaker," which is made for both horse and steam power, and a full line of soft-mud supplies, including pug mills, disintegrators, elevators, clay cars, dump carts, brick barrows and mold sanders, each having the Wellington quality, which the testimonial letters indicate stands for service.

THE FROST MFG. CO., Galesburg, Ill., has favored us with a copy of their new Catalogue H. It is devoted entirely to their line of automatic and throttling engines and high-grade tubular boilers. These are beautifully illustrated, the cuts being among the finest we have ever seen. Frost engines are peculiarly adapted to the needs of clayworking plants, and this company have facilities for manufacturing which enable them to turn out high-class engines at moderate cost. They also have a catalogue devoted to their dry pans (see cut on page 306) which they will gladly mail to any reader of The Clay-Worker who will address them.

COAL WASHING EQUIPMENTS is the title of a profusely illustrated catalogue issued by the Jeffrey Mfg. Co., Columbus, O., who are among the largest manufacturers of conveying and elevating machinery in the world. As quite frequently clayworking plants are operated in connection with coal mining, we are sure that many of our readers will find in this book much of interest, especially as the illustrations show the method of building and operating mining apparatus. A line of mine supplies, including cars, screens, buckets, etc., is also illustrated. Those who are interested are requested to write the Jeffrey Mfg. Co. direct.

CLAYWORKING MACHINERY in words of shining silver stands out in bold relief from the black cover of a new catalogue published by H. Brewer & Co., Tecumseh, Mich. Looking within we are apprised that it is the forty-first annual catalogue issued by that firm. Since 1859 they have been engaged in making stiff mud brick and tile machinery and are now offering a line of mills that have demonstrated their superior qualities. A line of up to date automatic brick and tile cutters are illustrated and described, as, too, are their Hand Cutters and Clay Crushers, Pug Mills and Elevators, and other appliances needed in a stiff-clay brick or tile factory. These are backed up by extracts from numerous testimonial letters of recent date, showing that Brewer machinery is losing none of its old time popularity. Write for a copy.

A NEW CATALOGUE of clayworking machinery has been received from the old and well-known firm of Taplin, Rice & Co., Akron, O. Like the machinery they make the catalogue has a very substantial appearance. Within the covers, which are of heavy green colored paper and bear the title in gold bronze, there are illustrations of the brick, pipe and pottery machinery which they manufacture. The list includes steel and wood frame dry pans, wet pans of varying capacity, bucket elevators, steel frame sewer pipe presses, drain tile machines, pottery molding machines, flower pot and insulator machines, self-contained jollies, power wheels, kick wheels, chaser mills, molds, and a full line of trucks, barrows, etc. etc., required in modern clayworking establishments, all of which are carefully described. In addition the book contains a striking bird's-eye view of their immense factory, a series of tables giving the transmitting power of belting and shafting, which make it well worth preserving. Copy can be had for the asking by our readers, who are requested to mention The Clay-Worker.

BRICK MACHINERY is the title of a handsome catalogue being sent out by the Henry Martin Brick Machine Mfg. Co., Lancaster, Pa. Opening the book, the first illustrations to catch the eye are half-tone portraits of Henry Martin, the venerable founder of the business and president of the company, and W. R. Martin, who has grown up in the business and, as secretary and treasurer of the concern, is bending his energies to keep step with the ever increasing demand for Martin machinery. "Since the time of Augustine," they say in the announcement, "soft-mud brick have stood the test and to this day are the most desirable and the most durable for building purposes." They might add that they will continue in demand to the end of time. Then follow illustrations of Martin steam and horse-power brick machines, of which they make various styles and capacities to suit almost any taste or condition. Next are illustrated pug mills, then disintegrators, dry pans, rock crushers, clay screens, mold sanders, sand dryers, hand presses, dump cars, barrows, molds and all manner of brickyard supplies, each carefully illustrated. Copy will be mailed free to those who write for it.

AN INTERESTING RECORD OF NATIONAL COMMERCIAL GROWTH.

The month of February, 1900, has made the most remarkable record of any February in the history of our foreign commerce. The exports during that month have averaged $5,000,000 for every business day in the month, and the total exports were $199,765,762, or more than 25 per cent. greater than that of any preceding February. Not only are the exports larger than those of any preceding February, but the excess of exports over imports is also much larger than in any preceding February, surpassing those of 1898 by nearly 25 per cent. and being more than 50 per cent. in excess of that of any earlier year. February is a month of heavy importations, and it frequently happens that the imports exceed the exports, so that an excess of $50,991,612 in exports over imports in February makes the record of the month a remarkable one, despite the fact that the importations, which amounted to $68,774,150, were slightly larger than those of any preceding year except 1893. The relative importance of the February, 1900, record will be more clearly seen when it is stated that the average February exports during the last 10 years were $76,000,000 per month, while the total exports of February, 1900, as already stated, were $119,765,762; on the other hand, the average February imports of the preceding decade were $61,000,000, making the average February excess of imports during that time $15,000,000, while that of February, 1900, is $50,991,612. This makes the total exportation for the 8 months ending with February about $75,000,000 greater than that of the corresponding months of the fiscal year 1899 and makes it apparent that our total exports in the fiscal year ending June 30 will exceed those of any preceding year by probably $100,000,000, and carry the total commerce of the year considerably beyond the $2,000,000,000 line.

Written for The Clay-Worker.

BEFORE.

I imagined these lines while others slept,
This work of a master hand;
I read them over, then I wept,
When I thought where I might land.

I imagined some things I don't care to tell,
Some things I don't want to see,
Suffice it to say this illustrates well
"What fools we mortals be."

I imagined we'd have a lot of good fun,
That would sizzle and fizz like pop;
And spring the old jokes one by one,
But never, not once, talk shop.

I imagined I saw the buttonhole man,
With his genial wholesome smile,
Cracking his jokes on the wholesale plan,
In his own inimicable style.

I imagined the man who came with his wife,
Who was quietly trying to shake her;
But he couldn't, not on your life,
Not much, umph umph, had to take her.

I imagined the present lined up with the past,
The future coming on a pace,
Old things were strictly outclassed,
Old ways were not in the race.

I imagined a plant without any cull,
A plant where all was serene,
Where the fireman never got full,
Where the brick never turned green.

I imagined a kiln that burned its own smoke,
Where fuel was saved by the ton,
Of grate bars that would never choke,
Where firing was simply just fun.

I imagined a business without any debt,
No matter how you dried it;
Where you needed no pallet, hake or rack—
For the man who sold me had tried it.

I imagined machines which would do as they said—
Where repairs were not the disideratum;
Where flaws were not all filled with red lead;
Where courts could not get at 'em.

I imagined a business without a debt,
Where you'd get anything if you'd ask—
But I've not been able to find that place yet,
And it seems a difficult task.

I imagined a trust with all of us in it;
Competition a thing of the past;
But the dream didn't stick a whole minute—
The world is getting so fast.

I imagined old things had all become new—
With the smartest I found myself;
Then I awoke to find this untrue,
For I was back on the shelf.

AFTER.

When the vaporings, which above appear,
Were done, and done to a turn,
The poet sat with a cheerful cheer,
And yearningly yearned a yearn.

Oh! for a chance to spring this wit;
To jump, so to speak, into fame;
'Twould be no doubt the evening's hit
But a ghost of a chance never came;

For "The Moth and the Flame" and the corn cob pipe,
And vaudevillians galore—
Filled all the time, till the night was ripe,
And he didn't get the floor.

—Orpheus.

THE BRICKYARDS AT BUFFALO.

THE TWO YARDS at Lancaster, one at Winchester and one at Pine Hill, are all members of the Buffalo Brick Association and have signed a contract extending two years more from January 1, 1900. The basis of the contract was fixed upon a ratio of about two millions for each machine on the different yards. Nearly all Martin machines are used in this vicinity. Sales through the manager's office are all made and regulated upon the number of brick each yard is entitled to, under the contract, and office expenses and losses figured on the same basis. Losses are very light, as there is practically no competition.

Sales for 1899 amounted to about forty million, and prices were $6.25 for hard, $5.85 for run of kiln and $5.30 for inside or soft delivered within three miles of yards. An addition of 25 cents per thousand each of the different haulage lines is made. An indemnity fund of $10.000 is held against a breach of contract. It has worked so well that all the yards are satisfied and are willing to renew.

The outlook for the coming year is very good, with the American Steel plants and the large manufactories which are continually being built along the Niagara frontier, it looks like a busy year for the brickmaker.

"NORTON."

TABLE OF CONTENTS.

Good Roads 235
Obituary 237
The Garden City Brick Co 238
Some Costly Bits of Experience 239
Button Hole Talks 240
Modern American Front Brick 241
Kaolin — Its Composition and Use, Etc 243
Standard Paving Brick Tests .. 259
Necessity of Good Roads 260
Regarding the Berg Press Patents 262
The Newell Crusher 262
Don't Toss Your Brick—It's Expensive 264
Recent Exhibit of Rookwood Pottery Prepared for the Paris Exhibition 292
The Brickyard at Buffalo 284

IOWA ASSOCIATION:

Reports of Members 244
President's Annual Address... 245

SECOND SESSION.

Brick Drying 246
Tests of Clay Products 247
Hollow Building Blocks 250
Shrinkage and Fusion Point for Certain Iowa Clays 251
Down-Draft Burning 252
The Manufacture of Tile 253

THIRD SESSION.

Brickmaking now and One Year Ago 253
The Individual Application of Modern Trust Principles to Clayworking 254
Origin of Iowa Clays and Shales 255
Report of Committee on Resolutions 257
The Election of Officers 257
The Banquet 257
The Trip to the Tile Works 257
List of Members 257
Culls from the Iowa Convention 258

CORRESPONDENCE.

Kiln Economy 240
The New York Brick Market .. 261
From Up in Maine 262
The Chicago Situation 263
Local Organization Proves Profitable and Pleasant 263
Time and Money well Spent... 263
Grate Bars or no Grate Bars 263
From the Far Northeast 264
Busy Times in the Far Northwest 264
From Way Down South in Dixie 264
Cheaper to Build of Brick than Wood 264
St. Louis Notes 290
Philadelphia Notes 290
Notes From Tide Water, Va.... 290
Pacific Coast News 292

EDITORIAL:

Current Comment 265
A Fine Picture 265
Brick Pavements Growing in Favor and Must Take a Leading Position 265
Up to Their old Tricks 266
By Way of Comparison 266
A Change of Base 266
Trade Literature 267
An Interesting Record of National Commercial Growth... 267
Editorial Notes and Clippings 286

MISCELLANY:

A Narrow Escape 258
Before—After 284

Index to Advertisements on Front Inside Cover Page.

FROM YOKOHAMA.

The Burt Manufacturing Co., of Akron, O., manufacturers of the Cross oil filter, have just received one of the largest orders of the year from Yokohama, Japan. This concern say they have already broken their record for business as compared with the early months of previous years. The Lehigh Valley Coal Co. have just sent in an order for nine, and the American Tin Plate Co. their twelfth order.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

SAVE THE DROPS

"We have tried others without success, but the
CROSS OIL FILTER.
We can heartily endorse and recommend."
CLEVELAND ELEC. ILLUM. CO., Cleveland, Ohio.

Your supply man will send you one on approval. The largest Brick and Tile Yards use them. They will save 50 per cent. of your oil.

Catalogue 43 tells the Story.

Burt Manufacturing Co., AKRON, O. U. S. A.
Largest manufacturers of Oil Filters in the World.

RAYMOND

BRICK MACHINERY

Where it is Used.

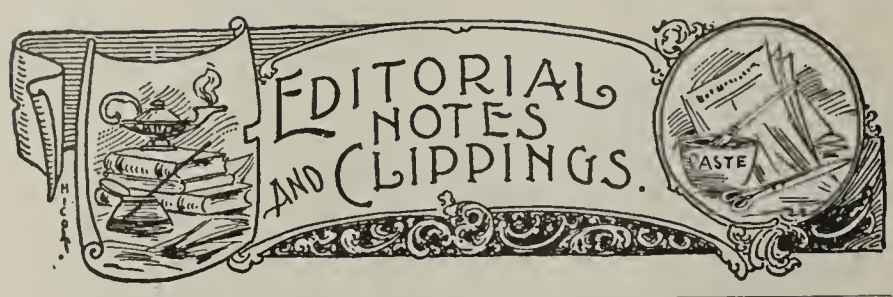
In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

RAYMOND BRICK MACHINERY is now used and in daily operation the world over. Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine.

Our great success has not been obtained without merit. Buy Raymond's and you get the best.

The C. W. RAYMOND CO.

DAYTON, OHIO, U. S. A.



Abbeville, La., wants a brickyard.

A brickyard is wanted at City Point, Va.

F. M. Woodsmall will erect a small brick plant at Gibbs, Mo.

T. B. & D. L. Ragan, Hawksville, Ga., want prices on brick machinery.

Parker & Van Rok have established a new brickyard at Centralia, Wash.

C. A. Coykendall contemplates erecting a first-class brick plant at Loveland, Col.

F. & A. Wehr's brickworks, at Baltimore, suffered a slight damage by fire March 10.

J. M. Gunkle and John De Sellern contemplate manufacturing brick at Denver, Col.

A new brickyard will be established at Elliott, Ia., by Jennings & Grant, of Creston, Ia.

The Western Brick Co. has been incorporated at Hastings, Neb., with a capital stock of $20,000.

Harry Wales will begin the manufacture of paving brick at Nebraska City, Neb., early in April.

The office of the Clearfield (Pa.) Clayworking Co. was damaged to the extent of $500 by fire recently.

The Verdigris Valley Brick and Tile Company has been incorporated at Neodosha, Kan., with $20,000 capital.

The Creighton (Mo.) Clay Co. has been incorporated by L. E. Chamberlin, W. A. Wade, T. J. Miller and others.

The Calverton Lumber and Brick Co. has been incorporated at Baltimore, Md., with a capital stock of $10,000.

Henry Randall has sold his brickyard at Bartonville, Ill., to his son, Albert, who will continue the business as usual.

The Rocky Ford (Col.) Press Brick and Tile Co. has been chartered by F. W., W. O. and E. Cheek. Capital stock, $15,000.

W. A. Krumpe, Saxonburg, Butler Co., Pa., wants to purchase some second hand, double deck cars for drying brick and tile.

The Winston (N. C.) Brick and Tile Co. has been chartered by W. T. Carter and others. They have a capital stock of $12,000.

S. A. Palmer and others have purchased the Zollar brick plant, at Marietta, O., and will begin the manufacture of brick at once.

Fred Peoples has purchased a half interest in the tile factory at Monmouth, Ill., and the firm will now be known as Magley & Peoples.

The Delaware Clay Manufacturing Co. has been incorporated to manufacture brick, tile, terra cotta, pottery and other clay products, at Dover, Del.

The Niagara Brick Co., Niagara Falls, N. Y., have recently secured a contract to supply 1,000,000 bricks to be used in a new steel plant at Tonawanda.

The Fallston (Pa.) Fire Clay Co. has decided to put in new machinery and double the present capacity of the plant, which is now 30,000 brick daily.

J. H. Grant contemplates starting a brickyard at Kane, Pa., and will be pleased to receive catalogues and price lists of brickmaking machinery and appliances.

D. L. Darr contemplates starting a small brickyard at Basin, Wyo., and writes that he would like to correspond with manufacturers of molds, brick barrows, etc.

W. Martin, of Parral, Chihuahua, Mexico, writes that he is in the market for brick and tile machinery and would be pleased to receive catalogues, price lists, etc.

The Taylor Brick Co., of Taylor, Williamson county, Tex., has been incorporated with a capital stock of $15,000, by Peter Schramm, J. A. Krueger and John Decker.

John Demers, a pioneer brick manufacturer of Troy, N. Y., passed away March 1, at his home in that city. Mr. Demers was 82 years old and quite active up to the last.

Alexander Chalmers has purchased G. T. McKenzie's interest in the brick and tile plant at Monkton, Conn. Hereafter the firm will be known as Barnhardt & Chalmers.

Thomas H. Boyd & Son, Knob Noster, Mo., wants a good practical man to handle a dry pan. He must understand the manufacture of vitrified paving brick from start to finish.

An explosion of dynamite at the Springfield (Ill.) paving-brick plant completely destroyed the magazine and caused a loss of about $100, but no injuries resulted to the workmen.

The Centerville Brick Co. has been organized at Centerville, Tenn., by J. B. Walker, J. B. Stuart, A. H. Grigsby, Stanley C. Broom, John C. Cunningham and J. R. Hungerford.

John Wick, Jr., recently purchased the entire interest in the Ford pottery, at Pittsburg, Pa. This is said to be one of the largest and most completely equipped potteries in the country.

Henry and George Weitzel, who have for years manufactured brick at Wrightsville, Pa., have dissolved partnership. Henry retires from the business, which will be continued by George Weitzel.

The air is full of rumors of an immense deal by which all the brickyards of Philadelphia will be combined under one general management. It is said that Frank B. McAvoy is one of the prime movers.

The latest news from Hudson River is to the effect that all the brick plants purchased by the American Brick Co. last year are now being repurchased by the original owners, who will operate them individually as before.

The Ashland Fire Brick Co., an organization composed of the representative brick manufacturing firms in that section of the State, was recently incorporated at Ashland, Ky. The company has a capital stock of $100,000.

The James Gardner, Jr., Co. has been incorporated at Pittsburg, Pa., by E. H. Henderson, J. K. Henderson and W. M. Howard, all of Pittsburg, for the purpose of manufacturing gas retorts, fire clay settings and fire brick.

Wm. Shellah has purchased an interest in Klose & Polenski's brickyard at Hastings, Neb., which is one of the finest equipped brick plants in Nebraska. They are making preparations to increase their output the coming season.

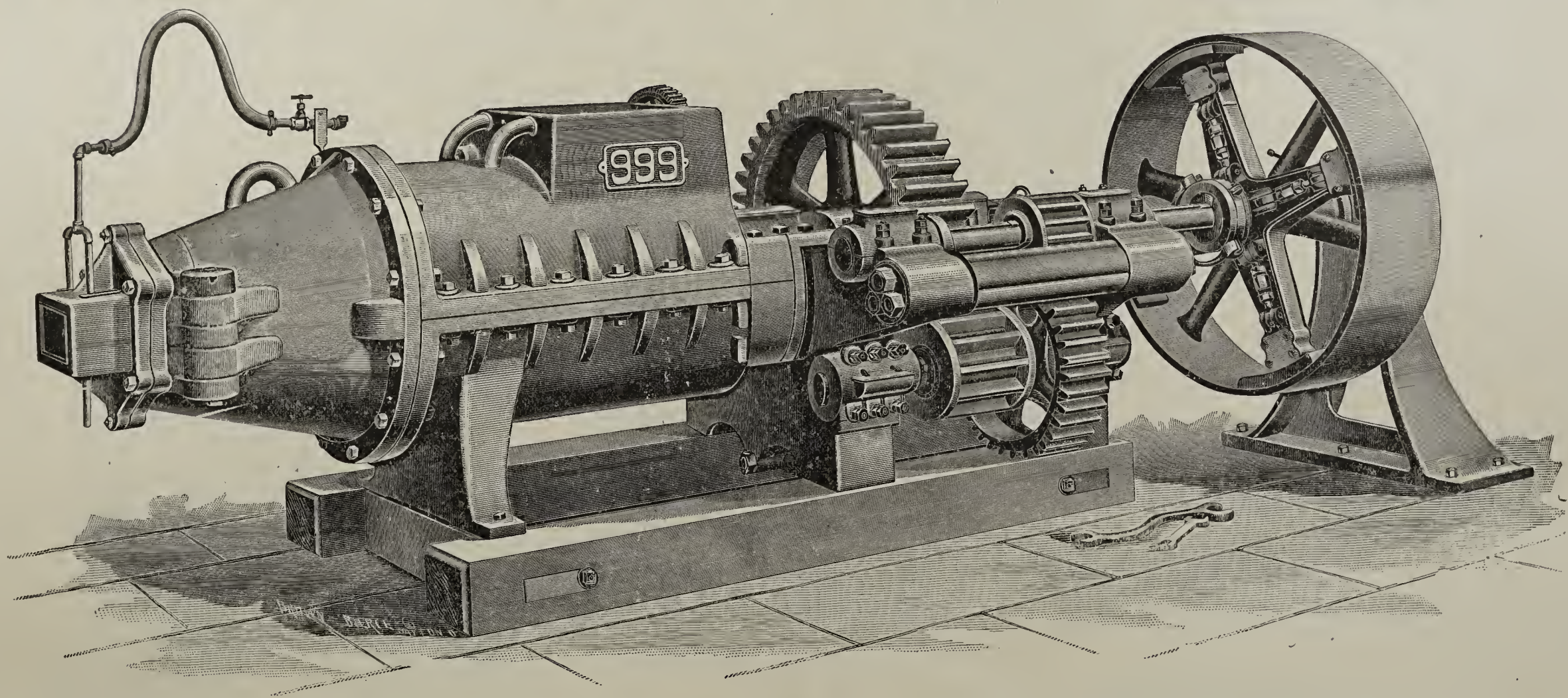
A new dry press brick plant is to be established at West Raleigh, N. C., on the Raleigh & Cape Fear R. R. Mr. W. H. Bostwick, formerly of Spencer, N. Y., will be the general manager. They expect to have the plant in operation early in the spring.

The firm of Dale & Goodwin, Des Moines, Ia., has been dissolved and F. & E. Dale will assume charge of the factory at Des Moines, while Robert Goodwin will move to Grand Junction and with his sons, Thomas and William, will have charge of the business there.

The great demand for coke oven brick is so urgent in the Connellsville coke region that some of the large manufacturers of coke have turned their attention to erecting plants of their own. The W. J. Rainey Coke Co., Dunbar, Pa., have found the market too slow in furnishing bricks for their

[CONTINUED ON PAGE 288.]

Raymonds Large Capacity Brick Machine.



"Looks are nothing, behavior is all," is just as true of brick machines as of mortal clay. The above cut shows that our 999 machine is a good looker, and in operation it is even better than it looks. The very embodiment of strength, it is the machine for those who want to increase the capacity of their plant, while for the making of paving brick from tough shales it is par excellence. Its great power makes it possible to make good pavers from shales that can not be worked successfully in ordinary auger machines. This machine has many good points which we will gladly enumerate in detail to every brick maker who is interested. Address,

We also make a variety of superior Represses, Cutting Tables, Clay Crushers, Pug-Mills, Tempering Wheels and all kinds of Brick Yard Supplies.
Write for new Catalogue.

The C. W. Raymond Co.,

Dayton, Ohio, U. S. A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

many new ovens in course of erection through the region, and have broken ground at Mt. Braddock, Pa., for a model fire-brick works, which will have a capacity of 25,000 bricks daily.

F. C. Feigel will in all probability start a brick plant at Rapid City, S. Dak. where he has a fine bed of clay. He will be pleased to receive catalogues giving prices of brick machinery, etc.

Silveira & Co., of Havana, Cuba, desire to communicate with reliable brick and tile manufacturers from whom they can purchase full cargoes of brick and tile, as they have a large trade in all kinds of building material, particularly roofing tile of the French pattern.

At a recent meeting of the Green & Hunter Brick Co., at Thurber, Tex., the resignation of Mr. Wm. Wassall, the superintendent of the Thurber plant, was accepted and A. O. Jones, who has had charge of the Ft. Worth office of that company, was elected to succeed him.

J. N. Gamble's brick plant, at Westwood, a suburb of Cincinnati, was damaged to the extent of $10,000 by fire recently. The flames originated in the dryer and nearly all the machinery and buildings were destroyed. The loss is covered by insurance and the plant will be rebuilt.

E. A. Poe, of Fayetteville, N. C., writes that he has moved his brickyard about half a mile from his former location, and is now located on a railroad, with good siding. He is putting in a new steam dryer and making other improvements that will give him one of the best equipped yards in the South.

The Miller Oil and Supply Co., Indianapolis, whose ad. will be found on page 296, are offering a lot of odd lengths of belting at cut prices. This includes both the Standard red stitched and rubber belting. Those of our readers who want anything of the sort will find it to their advantage to get their prices.

The W. H. Haws Fire Brick Co. began operating their new plant at Mt. Union, Pa., February 1. They have a splendidly equipped plant and are turning out a fine grade of silica brick. The equipment includes four grinding pans of the Phillips & McLaren make. W. H. Haws, of Johnstown, Pa., is general manager.

The entire plant of the Philadelphia Clay Material Co., operated by Stephens & Co., Philadelphia, Pa., was destroyed by fire March 12. A portion of the ground floor of the main building was fitted up as a stable, and six valuable horses quartered there perished in the flames. The loss is estimated at $50,000, partly covered by insurance.

Under date of March 2, Jenkins & Reynolds Co., Chicago, Ill., remitted subscription for Clay-Worker and announced that owing to the increase of business they have been compelled to take other yards and larger office room at 1210 Chamber of Commerce building, where they will be glad to greet their friends and visiting brickmakers.

In a recent letter, inclosing subscription to Clay-Worker for 1900, John E. Barnes, of Logansport, Ind., says: "I enjoy the Clay-Worker very much. It will keep me awake longer than most any other reading. Business has been good here during the past year and promises well for the present. I put in a 'Wallace' crusher and I have not had a moment's delay with it since it started."

Smith & Miller, Pittsburg, Kansas, write that they contemplate starting a pottery in that vicinity. The clays have been tested and proven very satisfactory. They contemplate making crocks, jars, jugs and pottery of that class, for which there is a large demand locally, and as they have good shipping facilities, it will not be difficult to work up a good, big trade. They will be pleased to correspond with a practical potter desiring to take charge of such a plant. A reliable man with a little money to invest will find this a very desirable location. The above named gentleman will be glad to give full particulars.

J. P. Norton, of York, Me., for many years a faithful member of the N. B. M. A., died at his home in York Harbor, February 27, after a short illness. Mr. Norton was a native of York, having been born there in 1837. He became interested in the brick business in 1884, and at the time of his death his plant was one of the largest in that section. He leaves a widow and one son and one daughter.

J. H. McKnight, Corona, Riverside county, Cal., writes that he is thinking of erecting a small brick and tile plant in that vicinity and will be pleased to receive catalogues, etc., giving the prices of machinery for crushing very hard non-plastic clays and molding same in the proper form. He would also be pleased to correspond with any one who can furnish a repress on which locomotive tiles and blocks can be repressed.

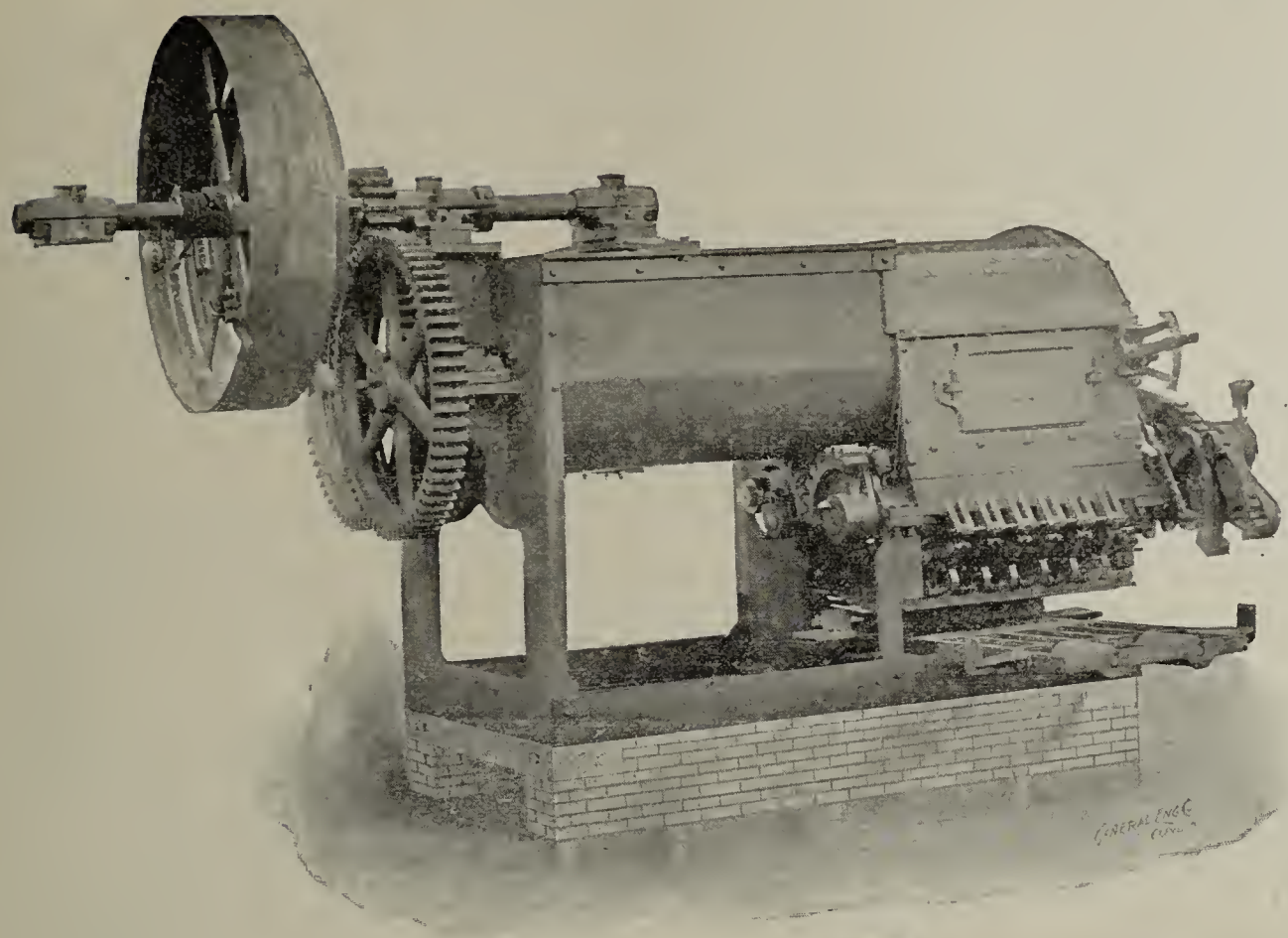
The Reid Brick Co. has been incorporated at Charlotte, N. C., by F. H. Reid, S. S. McNinch and B. D. Springs. It is the purpose of the company to have one of the largest and best equipped brick plants in the South. Mr. Reid formerly lived in Cincinnati, where he operated a successful brick plant, and brings to the new concern a vast amount of valuable experience. In addition to his interest in the brick plant, Mr. Reid is also Southern agent for the Wallace Manufacturing Co., of Frankfort, Ind.

The Ironton (O.) Fire Brick Co., in order to accommodate their growing trade and facilitate the shipping of their product, will establish another plant at Enterprise, Ky., where they own a valuable tract of clay land. The plant will be operated in connection with the Ironton concern, and will have a daily capacity of about 20,000 brick, which will be used chiefly to supply the Southern trade. F. E. Hayward, now secretary and treasurer of the old plant, will be general manager of the Enterprise factory.

The Sewer Pipe Trust, to which the daily press throughout the country has given so much publicity, has been refused articles of incorporation by the Secretary of State of Ohio. This will not seriously affect the deal, however, as they will in all probability be able to procure articles of incorporation in some other State. It will be operated under the name of the American Clay Mfg. Co., with head office in New York city. It is stated that no rise in price is contemplated at the present time.

H. L. Boaz, secretary of the Montello Brick Co., of Reading, Pa., in remitting subscription to Clay-Worker and membership fee in the N. B. M. A., writes that important business matters prevented them from attending the Detroit convention. He says they are at present adding several kilns and more machinery to their vitrified brick plant, at Montello, and are in addition to this erecting a large building and sewer brick plant, which will have a capacity of 100,000 to 125,000 brick daily. The brick business in that locality is very good and Mr. Boaz anticipates a first class season.

Messrs. C. & A. Potts & Co., Indianapolis, Ind., are very busy at their factory. Among recent orders they note that of a complete outfit for J. R. Chamberlin, Raleigh, N. C. This is a new plant and Messrs. Potts & Co. will furnish the entire equipment, including engine and boilers, an all iron horizontal brick machine, Potts disintegrators, mold sander, and a supply of trucks, molds, etc. Another similar outfit goes to the same locality, J. B. Sheppard, Winston, N. C., being the lucky man. C. L. Ross, of Waynesburg, Pa., will put in a complete Potts equipment of the same sort, as will also the Lincoln Fire Brick and Shale Co., of Bolivar, Pa., excepting the engine and boilers, which they now have. Reese, Hammond & Co., of the same city, will put in a Potts machine and other equipment for the manufacture of fire brick. These are but a few of the orders recently booked by this firm.



Over 75 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

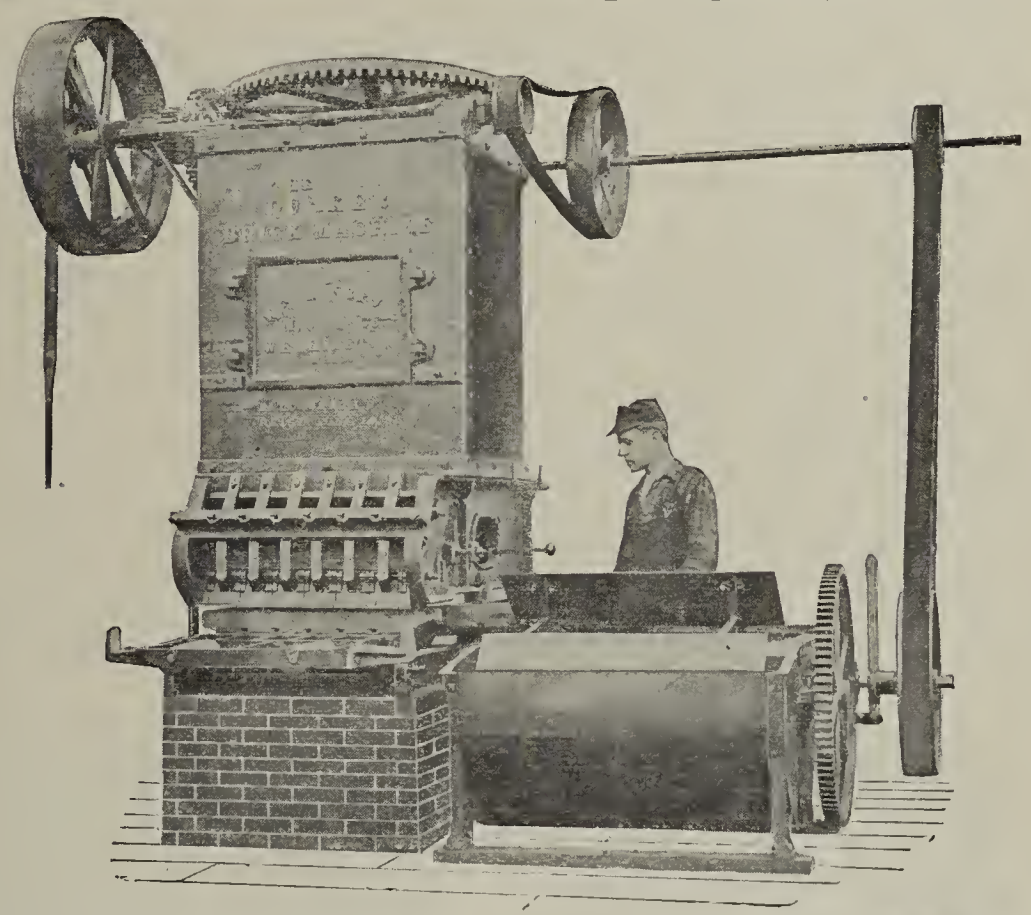
Long acknowledged the best for small and average sized yards.

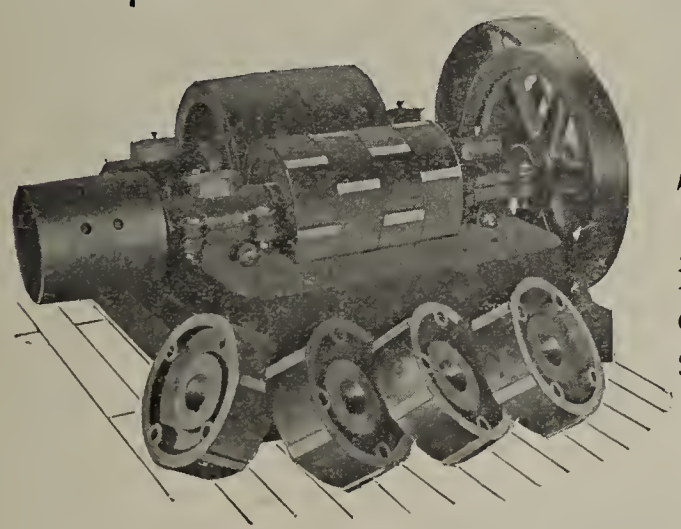
FOR 1900

We have added several new machines to our line.

Send for our 1900 Circulars.

Our mould-sander is the best, simplest and cheapest.

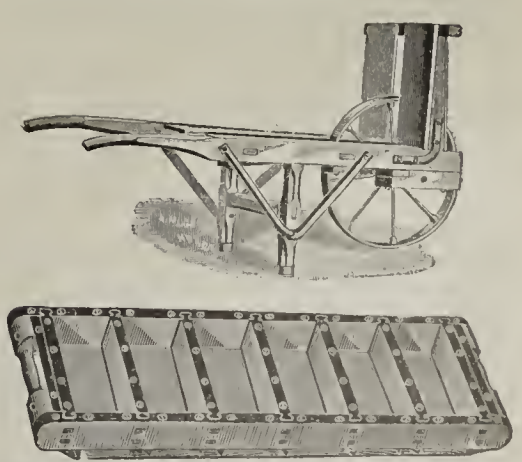




TWO Styles of Disintegrators, Solid rolls with inserted cutting bars and cutting roll made of hard sections.

MOULDS, TRUCKS, BARROWS,

and all other Supplies.



Nothing runs easier than our BALL-BEARING BARROWS AND TRUCKS.

The WELLINGTON MACHINE CO.,

WELLINGTON, OHIO.

LOU NOTES

PROSPECTS are better for work than anticipated at the beginning of the year. A number of heavy buildings are being figured, and others requiring about five million brick have been let. The prospect for residences are not very flattering. The comparisons of the years 1898 and 1899, as shown by building permits and as officially reported by Mr. C. F. Longfellow, building commisssioner, are as follows:

	ick ildings.		Frame Buildings		Additions and	
	Permits.	Value.	Permits.	Value.	Alterations.	Totals.
1898.....	1861	$7,449,729	786	$221,773	$182,387	$7,833,889
1899.....	1539	7,087,027	961	267,594	447,472	7,802,093
Increase			175	45,821	265,085	
Decrease	322	362,702				31,796

It is the general opinion that the World's Fair project will go through, and all the real estate men, contractors and material men are looking forward to a rich harvest. The Illinois Hydraulic Press Brick Co. have leased the works of the American Hydraulic Press Brick Co. at Collinsville, Ill., discharged all the workmen (except the watchman), from superintendent down, disconnected all water and steam pipes and closed up the works. They will not run it unless there is more of a demand for brick than they can supply from their own yard. Most of the yards in St. Louis are still shut down.

The terra cotta people are fairly busy, but could stand more orders and not be overcrowded. Fire brick is in good demand. The trade for sewer pipe is reported only fair.

Mr. Walter P. Grath is having phenomenal success with his coking furnace, and is daily contracting to equip new and old works.

It is reported that Mr. W. M. Lindeman, having resigned as general manager of the American Hydraulic Press Brick Co., will travel in the interest of the Illinois Hydraulic Press Brick Co., with headquarters at St. Louis.

Our friend Scott, of the Fernholtz Machine Co., is still talking and dreaming about the good time he had at Detroit.

Anthony Ittner, or, as it now stands, the Anthony Ittner Brick Co., has been running all winter, stocking up in pressed and molded brick and preparing for spring trade.

Mr. F. G. Evatt, recently manager of the terra cotta department of the Evens & Howard Fire Brick Co., has resigned, and is debating whether he will go East to accept a position offered him or ally himself with a local enterprise of much promise. BUFF.

PHILADELPHIA NOTES.

A HALF A MILLION dollar blaze last week, and one in February last equally disastrous, leaves a big blank void that can only be filled up by a judicious amount of brick and mortar. There is an odd saying, emanating from Cologne, somewhere in the middle ages, about the "devil taking care of his own." Lest, however, brickmakers should grasp this as a gratuitous reflection, I hasten to assure them that I mean by this that the proprietors fortunately escaped with their lives.

Yet, with all, I can but recall the fact that several of our local men lately said, "The season doesn't look very promising," when along comes this hot wave, that will certainly call for a few extra millions. Funny, isn't it? Just one of them "natural coincidences."

As this is a chilly morning, I can't do better than stick to the subject, although I'm sorry to have to report it.

—A Terra Cotta Blaze.—

Have just returned from viewing the havoc caused by fire at the terra cotta works of Stephens & Co., at Forty-sixth street and the Pennsylvania Railroad. The fire was discovered between 3 and 4 o'clock a. m. yesterday morning, the 11th, by the watchman, who immediately sounded an alarm. Notwithstanding the exertion of the firemen, the large storage, modeling and casting building was entirely destroyed, together with the stables and six horses. The three-story structure destroyed was 40 by 200 feet, facing the railroad, and was only recently rebuilt at a cost of $10,000. This, together with a large quantity of goods ready for shipment, and the horses, entails a loss of $20,000, fortunately, covered by insurance. The kiln remained intact.

Before the next issue some of us may learn of a wedding. John McAvoy, son of Thomas B. McAvoy, and brother of Frank, purposes entering the realms of matrimony about the middle of April. Closely identified with the work of the office, John is recognized now by his family trait, a sense of humor, obliging, generous and a nice smart appearance, coupled with genuine executive ability. The companion of his choice is, I am told, charming, idealized by the father. Let's wish them happiness forever and aye.

—Mr W. H. Conway—

On whom neither age nor care seems to betsow any attention whatever, assures me with a hearty but well drawn-out smile, that he, they and all of them, had a splendid time at the Detroit Convention. Gratifying, isn't it, when a man expresses himself thus. Through the vista of our imagination we can see him shoulder to shoulder with other conferrees exchanging greetings, taking up with other views, sometimes questioning his own methods, and returning home with a new set of resolutions. My one regret is that we cannot get a stronger contingent from here. Murrell Dobbins was hampered with a lot of business, and again he said it was "so —— —— cold."

—The Brick Market.—

The call at the present outlook is for all hard, but until the plans are out for estimates nothing definite can be said. The first week in April will determine much that applies to real estate operations and sky scrapers, of which there will be three or four, to make inroads upon the productions of the yards. W. P. L.

NOTES FROM TIDE WATER, VA.

THE SUFFOLK Clay Company have burned their first kiln of brick, which is very fine. In this kiln they had 350,000, and are now burning another kiln of 400,000. They are making 25,000 brick per day.

The firm known as the Clark-Monteville Company has changed the name of the plant to Nansemond Clay Company. They are now putting in a Bucyrus steam dryer, and have just finished building a square down-draft kiln for tile and hollow building block.

The Nansemond River Brick and Tile Company are putting in new machinery—J. D. Fate & Co. make—and building new kilns at their plant. They expect to increase their business this year, and are preparing for it.

Mr. Geo. Daugherty, of Alger, O., arrived this week, and will operate the Larson brick plant the coming season.

J. D. Turner & Co., of Norfolk, Va., expect to put in a new plant on the Elizabeth river, with a daily capacity of 50,000 brick. Their office is in Norfolk.

The Elizabeth City Brick Company, of Elizabeth City, N. C., are in the market for a dryer. Mr. Ward visited me this week to look at our Sharer hot-air dryer, and will visit other plants in this section that are using steam dryers. They are going to put in new machinery of the Henry Martin make, soft-mud, but have not yet decided on the dryer they will buy.

The Rocketts Brick and Tile Company, of Richmond, Va., office 905 East Carey street, W. E. T. Bass, secretary and treasurer, are in the market for new machinery, having written me in regard to their proposed change several times, saying they want a combined pug mill and brick machine of 25,000 daily capacity.

Mr. Charles Parker, of Franklin, Va., called at our plant the past week and said he was going to put in a new Sharer dryer and down-draft kiln for tile; also new machinery of the J. D. Fate & Co.'s make for side-cut brick.

Mr. John Sailes, of Lawrenceville, Va., visited our plant today. He is an old Baltimore brickmaker, and seems to be pretty well up in the profession. He is going to put in a new J. D. Fate & Co.'s side-cut machine, and has already placed his order.

The prospects in this section for 1900 are not encouraging by any means. We have just double the plants we had a year ago, and there will be butchers in the business instead of brickmakers before the season is ended. H. L. JACOBS.

Feb. 20, 1900.

WANTED — A night burner for down-draft kiln. State experience and wages wanted.
THE GARDEN CITY CO.,
3 1 d Farmingdale, L. I.

WANTED — STONEWARE TURNER, thoroughly competent and with first-class references.
LOS ANGELES STONEWARE CO.,
3 2 dm 423 N. Ave. 26, Los Angeles, Cal.

WANTED — A capable man to manage a small brick plant who can and will do any part of the work necessary, using an Adrian No. 2 machine. Would prefer to sell a working interest to such a party. Address
3 1 c NEB, care Clay-Worker.

FOR SALE — One large 20x36 cylinder, horizontal, I. & E. Greenwald make, slide valve engine, with attachments complete and in first-class order. For sale cheap. Address
THE HAYDENVILLE MINING AND MFG. CO., Haydenville,
3 1 d Hocking County, Ohio.

FOR SALE — Brick machinery.
We buy and have for sale all kinds of machinery; good second-hand engines, boilers, brick machines, crushers, pugs, presses, dryers, cars, rail, etc.
We have several yards in operation for sale. We equip entire new yards.
Write us what you want. Address
3 tf d C. W., care Clay-Worker.

LEVIATHAN "It's a Brick,"

....EITHER FOR....

Transmission or Conveying,

And why it is in such general use among CLAYWORKERS, is that it may be run with less tension than other belts, does not slip; may be subjected to the most excessive weather conditions without injury, and as a result,

Outlasts From Two to Five Rubber Belts.

MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.
55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.
Write for Samples and Price List.

Mention the CLAY-WORKER,
When writing to Advertisers
Mention the CLAY-WORKER.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

FOR SALE — Having purchased a Martin Letter A machine, I offer my Letter B and pug mill, 30,000 capacity, at a bargain.
JAMES B. OBERLY,
3 1 c Wilmington, Del.

FOR SALE — Forty kiln cars, one Buffalo Forge Co. engine dryer fan. Fan 8 feet in diameter, 3½ feet wide; engine 9x10 cylinder.
C. G. BARKWILL,
3 1 d Cleveland, Ohio.

WANTED — 8,000 or more brick pallets, size 33x10 inches, two strip, three batten, Mershon make preferred. Give full description, condition and price. DAYTON BRICK CO., Dayton, Ohio. 3-1-c

FOR SALE — One 9-foot dry pan made by Frost Co., Galesburg, Ill; in excellent condition; every part visible. Address
WESTWOOD BRICK CO.,
3 1 dm 51 Carew Bldg., Cincinnati, O.

WANTED — Position as foreman or burner of shale pavers or fire brick by thorough, practical and experienced man. No. 1 references.
3 1 cm 19TH CENTURY.

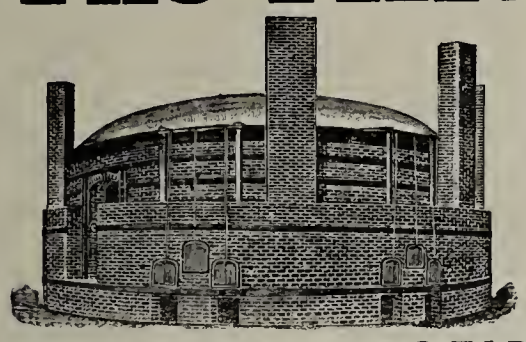
WANTED — A first-class man as superintendent of a sewer pipe factory. State experience, salary expected and for whom you have worked. Address
3 3 d J. T. S., care Clay-Worker.

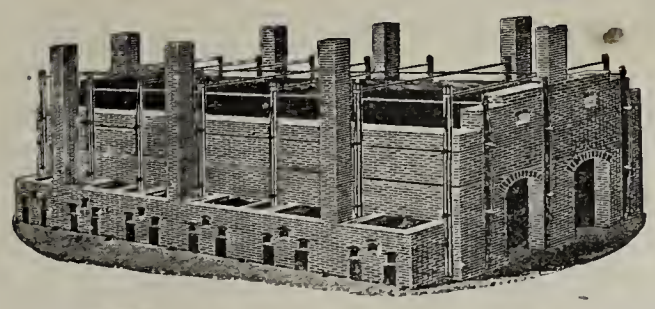
FOR SALE — The site of the Salamander works at Woodbridge, N. J., formerly used for the manufacture of fire brick, sewer pipe, hollow brick, etc.; also clay bank; on easy terms. Address
C. POILLON,
3 1 dm 39 Cortland St., New York City.

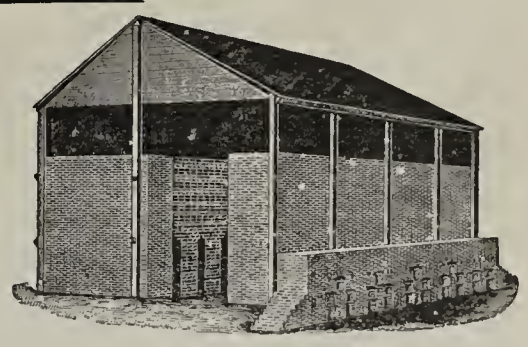
FOR SALE CHEAP.

A Timpson Brick Press and a Johnson Dry Pan; also large number of brick dryer cars and some track—all in good condition, having been used but little. A rare chance as they will be sold cheap for cash. Full particulars on application to
CHARLE OF EASTERN ONTARIO,
3 1 r care Clay-Worker.

The THREE KINGS.





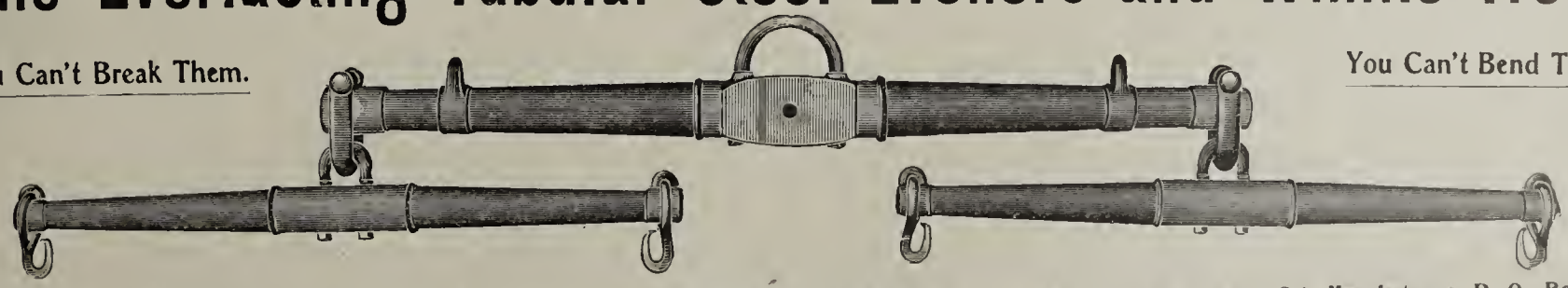


SWIFT SLACK COKING TABLE FURNACE KILNS. Over 700 old kilns changed and many new ones built in the past year. Send for Catalogue and Price List of Plans and Specifications.

F. E. SWIFT, Washington, Iowa. U. S. A.

The Everlasting Tubular Steel Eveners and Whiffle Trees.

You Can't Break Them. You Can't Bend Them.



THEY are **no heavier** than **wood wiffletrees** and **cost no more.** You can't afford to be without them.

PITTSBURG TUBULAR STEEL WHIFFLETREE CO., Sole Manufacturers, P. O. Box 480, **PITTSBURG, PA.**

PACIFIC COAST NEWS.

THE CLAY-WORKING FRATERNITY is passing through a very quiet season, although there is enough going on in the way of general work to make ends meet and keep things going. There has been quite a lethargy in the building market. That is to say, not as many large and fine structures have been going up during the past few months as one would suppose there would be, but there is reason to expect more in this direction in the future. In fact, already several fine buildings are being contemplated. One is a large hotel to be erected at the corner of Sutter street and Van Ness avenue, to cost in the neighborhood of a million and a half dollars. This hostelry is to be very elegant in its appointments and will be the finest of its kind west of Chicago. The Crocker estate is to launch this enterprise.

The Steiger Terra Cotta & Pottery Works are running very well on minor work and sewer pipe contracts.

Gladding, McBean & Co. have been awarded the contract for the architectural terra cotta work on the new Hale building that is in course of construction on the south side of Market, near Sixth street. This work will run onto about $13,000. This same firm is pushing to completion the work on the dome of the $60,000 gray stone grand stand which is being erected in the Golden Gate Park by Claus Spreckels, who donated the same to the city for the weekly open air band concerts. The dome work is architectural terra cotta and will cost about $7,000.

The government is advertising for a quantity of fire brick and fire clay to be used at the naval station, Puget Sound, Wash.

The Weston brickyard, at Weston, Ore., has been given the contract for furnishing 250,000 sewer brick for the city of Walla Walla, Wash. These brick are exceptionally hard, and are used in making flush tanks and manholes. The yard will begin work this season about April 1, if weather conditions are favorable.

A kiln of 150,000 brick will be burned at Loomis, Wash., by Mr. Fowler, an experienced brickmaker from North Yakima, that State. A fine grade of clay has been found suitable for his purpose about two miles south of Loomis, where a plentiful supply of wood and water make the location most favorable for the enterprise.

It is said there is a prospect of the pottery at Antioch, Cal., being started up. Parties were there recently looking over the plant with that end in view.

G. W. Friday intends to run his brickyard at Medford, Ore., to its fullest capacity this season, and will shortly commence the manufacture of brick for the new Halley block, for which he has the contract.

S. Childers, of Medford, Ore., has secured a steam engine and will commence making pressed brick as soon as the weather permits. He proposes making 600,000 during the coming season. The first kiln he will burn will contain 160,000 brick, which will be for immediate use.

The Holt & Gregg brick firm is making extensive preparations for a big run the coming season at its brickyard near Anderson, Cal.

W. G. Leggett, of Kansas City, has become interested in some large deposits of Indian pipe clay which have recently been located near Jerome, Ariz., in the Black range.

The machinery at the Remillard brickyard, near San Rafael, Cal., is undergoing a thorough overhauling and many improvements have been made. The Remillard Brick Company is filling an order for 200,000 brick to go to the Hawaiian Islands.

Some clay deposits have been discovered at Chehalis, Wash., by Ernest Bechly, who claims that it is a good fire clay and suitable for pottery.

Stevens & Collins, builders and brickmakers, of Lewiston and Kendrick, Idaho, have bought the Pioneer pottery plant at Palouse, Wash., and it will be increased and equipped with modern machinery. Hollow block ware, white ornamental and fire brick and tile will be manufactured, as well as vitrified paving brick. A new brick and tile machine, having a capacity of 15,000 brick daily, and apparatus for manufacturing all sizes of tile has been ordered and will be installed in the near future. Stevens & Collins will give their whole attention to the manufacture of brick, tile, foundation ware and vitrified brick, while Deguine & Cockran will operate the pottery department.

Messrs. Judia & Dolson, contractors and builders of Solomonville, Ariz., have let the contract to Seth Merrel, of Thatcher, Ariz., to take charge of their brickyard, and the work of making and burning brick will begin within a short time on Mr. Judia's ranch east of Solomonville.

Crosson & Gray, building contractors and proprietors of the Roswell brickyard, at Roswell, N. M., have built up a flourishing business in that city. They commenced operations there less than a year ago and are meeting with gratifying success.

Dodd & Lembke, of the fire-clay works at Socorro, N. M., have recently shipped five carloads of brick from that point.

Mackenzie Bros. have installed a brick plant on False Creek, near Vancouver, B. C.

George Kreiger has a force of eight men and two teams at work at the Oro Dell brickyards, Lagrande, Ore., preparing for the season's work. It is estimated that there will be a demand for about 2,000,000 brick in Lagrande the coming summer. A large portion of this amount will be required in the construction of the new Masonic Temple and Mr. Bohnenkamp's building. There are also several other structures under contemplation, and a large amount of brick will be required.

A repress machine is to be added to the plant of Garrett Bros., at North Yakima, Wash., this spring. It is anticipated that there will be a number of buildings erected in that section during the summer, and Garrett Bros. hope to fill a number of orders for their brick, which are used largely in business building fronts.

A fact not generally known is that a fine body of fire clay exists within two miles of Modena, Utah. Several sacks of this were recently taken to Salt Lake City for quiet experimenting at the instigation of prominent capitalists. The matter has been kept so secret that no particulars can be learned. It is known, however, that F. Brind, a resident of Ogden, and formerly of the Rio Grande Western engineering department, located a claim covering a large deposit of fire clay near Modena, some time ago. This, on being tested, it is claimed, came up to every requirement for the manufacture of very fine fire brick.

Charles Hegele has sold his interest in the Pacific Pottery Company, at Portland, Ore., to L. P. L. Le Compte.

San Francisco, March 5, 1900.

RECENT EXHIBIT OF ROCKWOOD POTTERY PREPARED FOR THE PARIS EXHIBITION.

The Rockwood Pottery Co. recently held an exhibition in Cincinnati of the pottery which it intends to send to the Paris Exposition. The exhibition was largely attended and pronounced by experts to be one of the finest of its kind ever held either here or abroad. It included 1,000 pieces, the value of which was about $42,000.

Some of the vases alone were worth $500, and two specimens were not for sale at any figure. They were the work of one of the most celebrated artists in this line.

This display is an example of the wonderful strides the Americans have made in this industry during the past few years, and is encouraging to the trade at large, as it clearly shows that American ingenuity and skill can successfully compete against the whole world.

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.

For **uniformity** in **burning, hardness of ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump,** and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

FOR SALE — One hundred and ten ball-bearing, single-deck dryer cars, in good condition. Eighty of them have never been used. Price, $7 each. Also, two transfer cars, good as new, at $16 each. The cars are 24-inch ga. Address EXCEL, Plymouth, Richland county, Ohio. 3-1d

FOR SALE CHEAP—5,000 to 6,000 Mershon C Pallets with risers on ends; Two 6-Mould Brick Machine (Soft Mud); One Winding Drum; Two 1½ yard Bottom Dump Clay Cars. Machinery practically new.
Address,
H. MULBERGER, Executor.
3-3 cm. Watertown, Wis.

FOR SALE—Two 4-Mold Boyd Press; 2 Clay Elevators; 2 Clay Screens; 8 Spring Trucks; Atlas Engine, Cylinders 14x20; Boiler 60-Horse Power; Two 6-foot Dry Pans. All in good condition, having been used very little.
Address,
C. P. MERWIN BRICK CO.,
3 1 d Berlin, Conn.

WANTED — A situation as superintendent or foreman of paving brick department in a clay manufactory. Have had years of experience, and can successfully manufacture blue vitrified paving brick, such as have proven so satisfactory in England. They are generally considered the most durable of all paving brick, and can be made from shale or clay used in this country in the manufacture of sewer pipe, etc. These brick can be made at small cost—little, if any, more than common builders. I will guarantee this and to produce paving brick the equal of any made in this country. I know whereof I speak, and do not propose to indulge in any experimental work. Can give the best of references. Address "BLUE PAVER," care Clay-Worker. 3-1-r

A COMPLETE BRICK PLANT FOR SALE AT A BARGAIN.

EVERYTHING NEW.

Only brick plant located in Warren, O., a town of ten thousand inhabitants. Having bought same at assignee's sale, must be disposed of at once.
THE HORTON MFG. COMPANY,
Painesville, O.

The GRATH Slack Coal, Gas... and Coking Furnaces

The ILLINOIS SUPPLY & CONSTRUCTION CO. will protect all users of their Furnaces, and will prosecute all infringements on their Patents, which fully cover the application of heat UNDER THE COKING TABLE, in combination with the radiating heat from the top of main arch—as will be seen by two of their claims, viz.:

PATENT Nos. 639,037 and 640,144.

1. A furnace comprising outer walls inclosing a grate and combustion-chamber, and having a raised imperforate platform arranged under the roof of the combustion chamber and extending horizontally from a wall thereof so that a mass thereon may be removed onto said grate, the ducts or channels beneath said platform being open to the products of combustion and the space above said platform being continuous with the combustion-chamber; substantially as described.
2. A furnace comprising outer walls inclosing a grate and combustion-chamber, and having a raised imperforate platform arranged under the roof of the combustion-chamber and extending horizontally from a wall thereof so that a mass thereon may be pushed off onto said grate, the space beneath said platform being open to the products of combustion, and the space above said platform being continuous with the combustion-chamber and cut-off from the supply of air, substantially as and for the purpose set forth.

Will give you better satisfaction with nothing but the cheapest grade of soft slack coal than with lump coal in the ordinary furnaces, and will also consume all the black smoke.

The Ludowici Roofing Tile Co., Chicago Heights, Ill., are now attaching the **Grath Furnaces** to all their kilns, after making a number of most successful tests; although, a year ago they tested another style of Coking Furnace at their plant, which resulted in failure.

For further particulars apply to the

ILLINOIS SUPPLY & CONSTRUCTION CO.,
St. Louis, Mo., U. S. A.

See Ad. on Page 310.

WANTED — A party with about $8,000 to take a half interest in a soft-mud yard. Address O. V. PAYE,
12 4 c Station "C," Los Angeles, Cal.

FOR SALE —A good, well-equipped tile factory, in central Ohio. Worth the money. A bargain. Address
2 3 cm J., care Clay-Worker.

WANTED — Two seven-foot (second-hand) dry pans.
MONMOUTH POTTERY CO.,
2 3 d Monmouth, Ill.

WANTED — Position as superintendent of paving or press brick plant, by a thorough, practical and experienced man. A No. 1 reference. EXPERIENCE,
3 1 c Care Clay-Worker.

FOR SALE — One 36-inch Stedman Mill, latest make, almost new. Can give good reason for selling. Apply to
ERIE CHEMICAL WORKS, Erie, Pa.
2 3 d

FOR SALE — First-class Sewer Pipe Plant. Unlimited amount first-class clay and a good market for all ware made. Good reason for selling. Address J. W. & T.,
2 3 dm Care Clay-Worker.

FOR SALE — First-class tile works, equipped for making drain tile, brick and flower pots; four acres of good clay and shale. Address
GOODING & STOOKEY,
1 3 c Belleville, Ill.

NOMINAL RENT — Small brick plant, center mining region northern New Jersey; near three competing railroads; unlimited sale. O. H. BABBITT,
1 3 cm Morristown, N. J.

FOR SALE — Brick and tile works, in good condition; large capacity; plenty of market; would consider other property for part pay; now in operation. Address
D. W. TOWNSEND,
9 6 d Cherokee, Ia.

FOR SALE — One four-mold Eureka dry pressed brick machine, but little used, at a great bargain; one No. 2 Worrell dryer; one 48-inch Ross disintegrator.
C. SIEDLER,
11 tf d 156 Fifth Ave., New York, N. Y.

RARE OPPORTUNITY — An interest in well located and well equipped Brick Yard in Northern Michigan is offered on very desirable terms to a reliable manager with capital. Good market, inexhaustible material, cheap fuel and two railroads
GEO. KANE,
2-tf dm. Care Clay-Worker.

FOR SALE CHEAP—One large size Iron Pug Mill, has been used very little, good as new, made by E. M. Freese & Co., of Galion, Ohio. One Crusher in good running order, made by H. Brewer & Co., of Tecumseh, Mich.
Address
WARREN BRICK & TILE WORKS,
1 3 c Warren, Mich.

FOR SALE CHEAP — One 4-mold Simpson dry press; used one year; cost $4,000; will sell for $1,100 f. o. b. cars Washington, D. C.; also two 100 H. P. Westinghouse engines $400 a piece. Inquire of
TOM COLLINS,
Phoenix Building, Washington, D. C.
1 3 d

WANTED — For a large clayworking establishment, located near New York city, an experienced superintendent or manager, who thoroughly understands the manufacture of fireproofing as well as common brick; applicants please state past experience, amount of salary expected, references, etc. Address
H. F. JAMES,
11 tf d 156 Fifth Ave, New York.

FOR SALE—200 acres coal land, six foot vein two mines open and operating, equipped with half mile switch to main track, surface under cultivation, situated in Eastern Illinois. This land has also a strata of fine clay suitable for paving brick manufacture; some of the finest paving brick in the country having been made from it. Will sell coal and clay interests together or separately. For particulars apply to DR. JOSEPH FAIRHALL,
1 3 c m Danville, Ill.

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

WANTED — A good, practical brick maker to take charge of brick plant making vitrified sidewalk brick, drain tile and hollow building blocks. Permanent position for right man. Address
3 1 d L. B. C., care Clay-Worker.

WANTED — Clay manufacturing plants to locate in cheap coal belt of southern Illinois and Indiana. Special inducements, with excellent quality of shale, pottery clay, fire clay and surface clay. Address
L. H. SKINNER,
Room 811, Lincoln Trust Building,
3 3 d St. Louis, Mo.

FOR SALE —Two Penfield auger brick machines with automatic end cuts; 50,000 capacity each. Two Sioux City Corliss engines, 75 to 100 horse power each. One boiler, 80 horse power, with full front. 10,000 wooden brick pallets. All of this machinery is as good as new. Will sell cheap.
3 1 d J. A. BUCKSTAFF, Lincoln, Neb.

FOR SALE.

Michigan brick and tile machine, with upright pug mill, pulleys, tile dies 2½ to 12 inch, hollow brick die, hollow block die, side and end-cut brick dies and all cutting tables.
No. 2 Adrian brick and tile machine, tile dies 2½ to 8 inch, side and end-cut brick dies and combination cutting table.
Board delivery cutting table, new.
Little Giant repress, same as new.
Kiln grates.
30 horse power tubular boiler, with front, stack and grates.
Canton duplex boiler feed pump, new.
40 horse power center crank engine.
40 horse power tubular boiler, all fixtures complete.
Penfield double plunge machine, tile dies 3 to 12 inch, brick die and all cutting tables, same as new.
Rotary brick and tile table, nearly new.
65 foot, 8 ply, 14 inch Leviathan belting.
3 tf d J. F. CLARK, Morenci, Mich.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS, Agent and Patentee, **161 Grand Street. Rahway. N. J.**

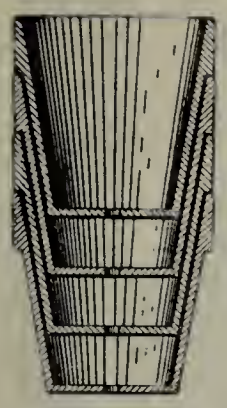
H. W. CALDWELL & SON CO.,

CONVEYING, ELEVATING AND POWER TRANSMITTING MACHINERY.

OUR NEW PLANT.

Western Avenue, 17th-18th Streets, CHICAGO, ILL.

With enlarged plant and the best facilities for economical production of our line of machinery, we announce change of address as above.



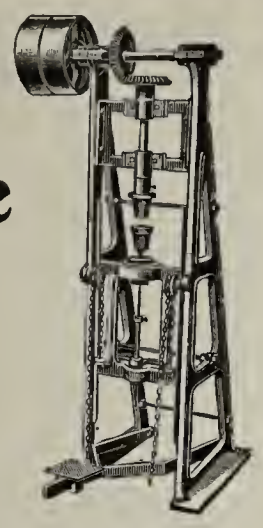
Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.



The Rockwood Mfg. Co.,

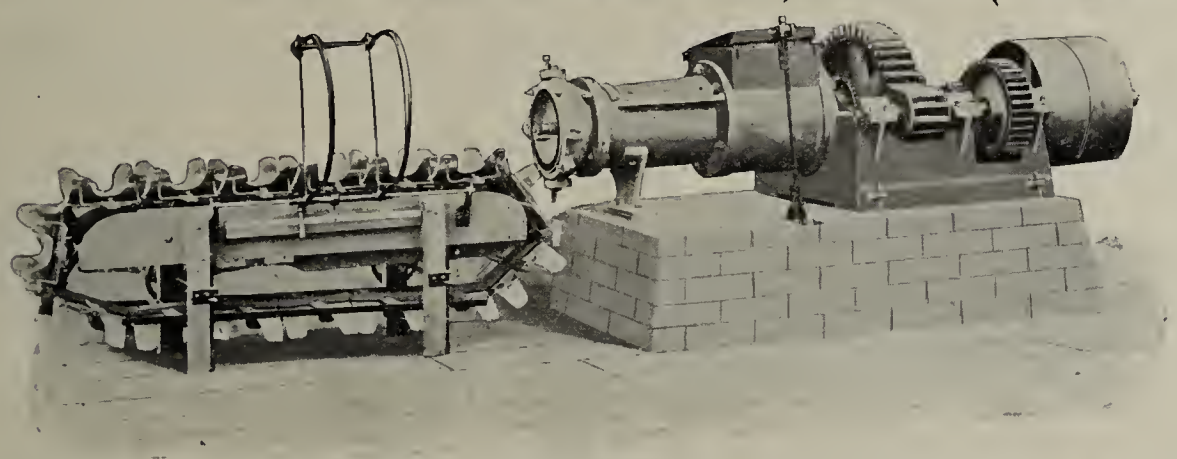
78 South Pennsylvania St., INDIANAPOLIS, IND.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,

Detroit, Mich., U. S. A.

FOR SALE — One of the best paying brick and tile factories in Iowa.
12 tf d Lock Box 36, Lohrville, Ia.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — A large tract of land, comprehending what is unquestionably the finest vitrifying shale deposit in the country for paving brick, sewer pipe and stoneware. Labor, fuel, transportation the best.
R. L. LITTLE,
Room 414 Fullerton Building,
2 2 dm St. Louis, Mo.

FOR SALE — Boiler and engine in No. 1 condition, as good as new. Cylinder engine 12x12; boiler about 40 horse power. All connections ready to set up in good shape. Also 40-foot smokestack, 20 inches in diameter, one Penfield plunger brick machine, one Freese board delivery cut-off table. For prices, etc., address
2 3 cm S. SHANNON, Shellsburg, Ia.

FOR SALE — Splendid plant for manufacturing brick and porous terra cotta. Situated 15 miles east of Cleveland, O., between Lake Shore and Nickle Plate Railroads, having switches from both roads. Has 25 acres excellent clay bed, boilers, 150 horse-power engine, machines, presses, steam dryers, kilns and full equipment. Reason for selling, owner nonresident and in ill health. For further information call at 701 Cuyahoga Building, Cleveland, or write to
2 4 dm W. B. OWEN, Hobart, Ind.

FOR SALE — Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address
OLD BRICKMAKER,
1 tf d Care Clay-Worker.

FOR SALE.

Sites for brick plants on fine tract of land, on James river, in Virginia. The land fronts the river 1½ miles, where vessels can lie within 30 feet of kiln. Banks are 50 feet high, 35 to 40 feet composed of this clay and the lower 10 or 15 feet contains excellent molding sand. Wood sells for $2 per cord. Newport News, Norfolk and Portsmouth, near by, are terminals for three extensive railroads, and, together, use 100,000,000 brick a year. The demand is increasing each year. An abattoir is being built, which will require millions and millions of brick. Will employ five to six thousand workmen, which means the extensive building of homes. Sites will be leased at low figures and long time. If you are interested it will pay you to investigate. Address W. L. J., care Clay-Worker.
2 2 cm

FOR SALE.

One Martin horse-power brick machine.
One Standard wood-frame steam power brick machine.
Two extra heavy Quaker machines.
One Fletcher and Thomas pug mill.
One Anderson brick machine, with 12-foot pug mill.
Three reliable hand brick machines.
One Potts mold sander.
One new Brewer crusher.
One second-hand Brewer crusher.
One Carnell repress.
Two Penfield roll crushers.
One Penfield No. 7 brick and tile machine.
One Penfield soft-mud machine.
One Penfield double plunger brick machine.
One Freese board delivery cut-off table.
One Fate-Gunsaules rotary table.
One 40 horse-power boiler and engine.
One Andress dry press machine, has two screens and two sets of special molds, for octagon, cornish and circle brick; good as new.
One Monarch brick machine, used two summers; in excellent repair.
HORTON MFG. CO.,
2 tf d Painesville, O.

ODD LENGTHS OF RUBBER AND GIANT RED STITCHED, from 2 ft. to 80 ft. long, and from 1 in. to 16 in. wide; 3, 4, 5, 6 and 8 ply. **First-Class Belting** less than mfrs. cost prices. **Get Our Prices** on Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gages, Brass Fittings, Hard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weiler Jacks, Circular Saws, Sawing Machines, One-Man-Log Saws, Asphalt Felt Roofing, Endless Thresher Belts. **One Trial** will make you a regular customer of the **MILLER OIL AND SUPPLY COMPANY, 36 McNabb St., Indianapolis, Ind.**

FOR SALE CHEAP.

Two 4-Mold Simpson Dry Presses, Cost $3,500 each. Only used three months. Plant having been changed to Paving Brick. Just as good as new. Will sell for $1,500 each F. O. B. cars, Cleveand, Ohio. Inquire of

FRANK B. MANY,
809 Cuyahoga Bldg. Cleveland, Ohio.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. Carbonate of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

Have you thought About your Cuts for your NEXT CATALOGUE? We Make 'em Right
INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.
INDIANAPOLIS, IND.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } Chenoa, Ill.

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

W. B. MERSHON & CO.,
Saginaw. East Side Mich.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

Evens & Howard Fire Brick and Sewer Pipe Company.

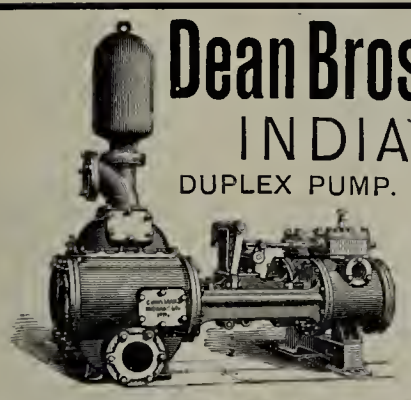
ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Dean Bros.' Steam Pump Works

INDIANAPOLIS, IND.

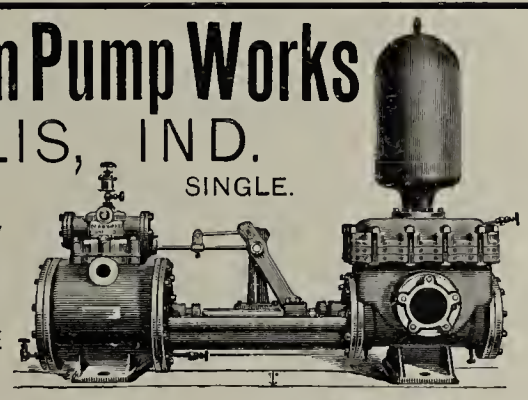


DUPLEX PUMP.

PUMPING MACHINERY FOR ALL PURPOSES.

SEND FOR CATALOGUE AND PRICES.

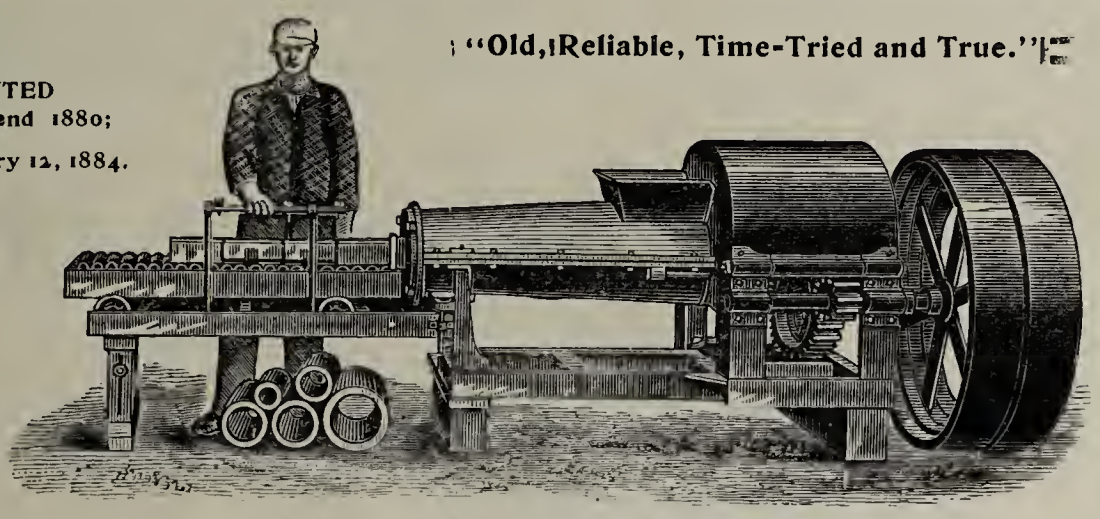
SINGLE.



KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

VanDuzen's STEAM JET Pumps.

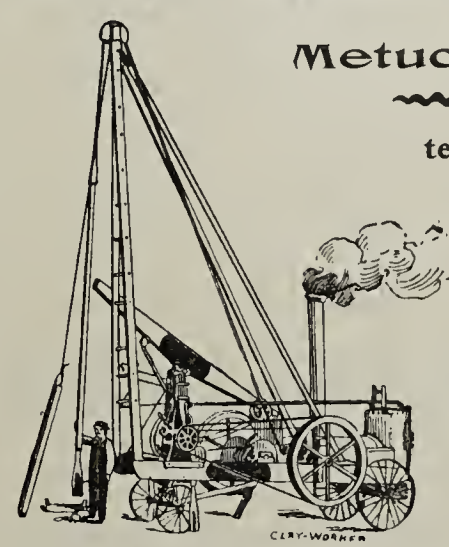
Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** etc., for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

W. R. Osborne,

Metuchen, N. J.

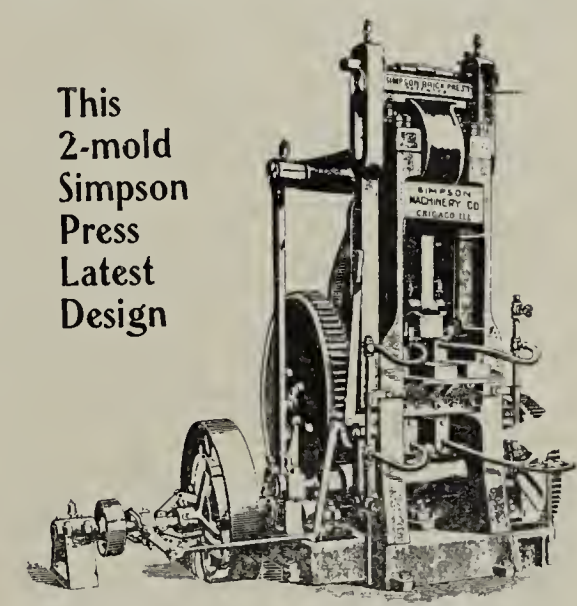
ter Wells, Tanks, Pumps, Etc.



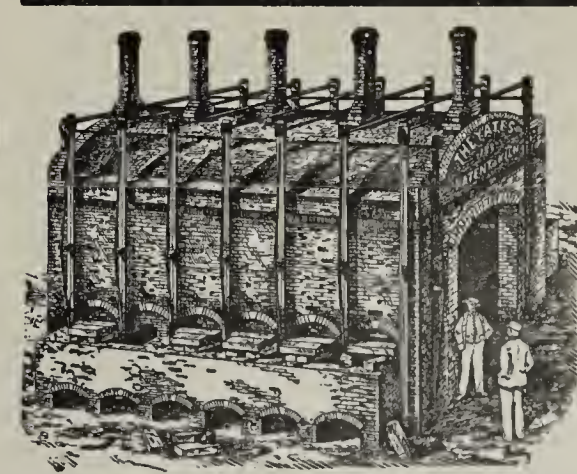
LOW PRICES

For Sale at a Bargain

This 2-mold Simpson Press Latest Design



WESTERN MACHINERY & SUPPLY CO.
163 La Salle Street, Chicago.



Economy of Fuel and Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.
Hot air dryer. Continuous and Muffle Kiln.

ALFRED YATES,
JOHNSONBURG, PENN

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY,
Industrial Agt., St. Louis, Mo.

or

E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between CINCINNATI, INDIANAPOLIS, DECATUR and SPRINGFIELD, ILL.

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	3.35 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

Solid Train Between

Sandusky and Peoria

—AND—

INDIANAPOLIS and MICHIGAN CITY,

FT. WAYNE and CONNERSVILLE.

—o—

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger	7:00 a. m.
*No. 22 Passenger	1:20 p. m.
No. 24 Passenger	7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger	10:20 a. m.
No. 23 Passenger	2:50 p. m.
No. 25 Passenger	6:20 p. m.

*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent, Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

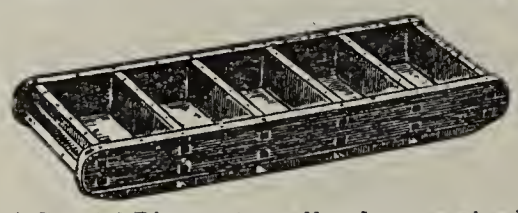
For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**



We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

The PERFECT CLAY SCREEN.

HAS NO EQUAL.

This Screen positively Saves one man.

Increases grinding capacity.

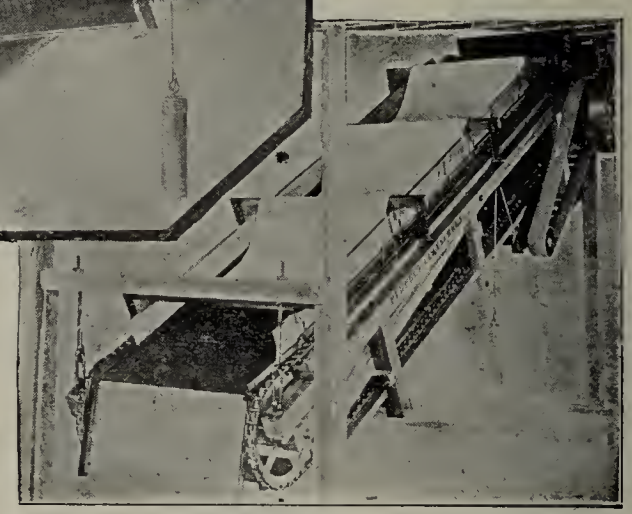
Gives a finer grade of clay

Does the work as well in cold weather as in warm.

Screens cold moist clay as well as dry.

It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

The Peerless System Up-Draft, Down-Draft and Continuous Kilns

Is the Acme of Perfection in Brick Burning.

READ WHAT THEY SAY ABOUT IT:

LaPrairie Pressed Brick and Terra Cotta Co., Quebec:

"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, demonstrates our Entire Satisfaction with your PEERLESS SYSTEM.

Elmsdale Brick Co., N. S.:

"Never saw a Kiln work so even and free both in watersmoking and burning in all my life. The arches were as good as any other part of the Kiln."

John Cubbins Sons, Memphis, Tenn.:

"After burning the first kiln that was changed, the second time, we found the improvement so great and so much Superior to the old updraft kilns, that we are now changing our entire system to your PEERLESS PATENT."

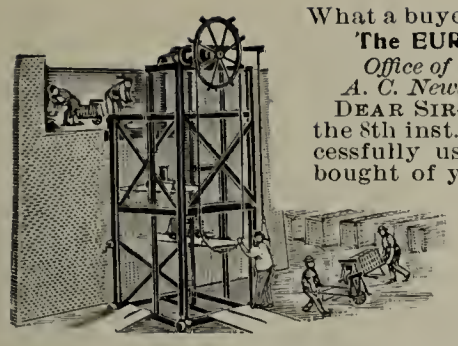
Jacob Kline, Baltimore, Md.:

"Your system of burning good hard brick is without doubt the best I have ever seen."

And there are Others.

No matter what you manufacture, or the capacity of your plant, if your make is of clay and you want it burned, write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. Montezuma, Ind.

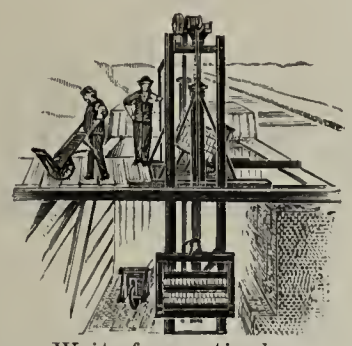


What a buyer in 1890 says to-day of
The EUREKA BRICK ELEVATOR

Office of the Buffalo Brick Association,
A. C. Newton, Patentee, Crescent, N. Y.

DEAR SIR—Replying to your inquiry of the 8th inst., this Association is still successfully using the two brick elevators bought of you in 1890. They are useful and practical machines, and the long and hard use of them by us shows that they are constructed in a very serviceable manner.

Very truly yours,
The Buffalo Brick Asso.
O. W. WAGER, Mgr.



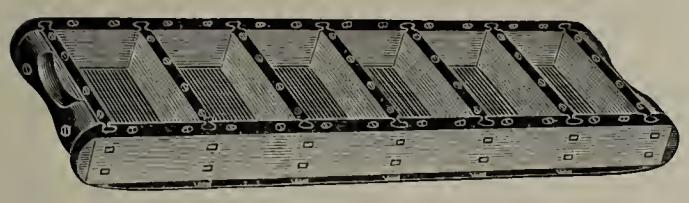
Write for particulars.

A. C. NEWTON, Manufacturer, Crescent, N. Y.

HARDIN & GRAY,

MANUFACTURERS OF

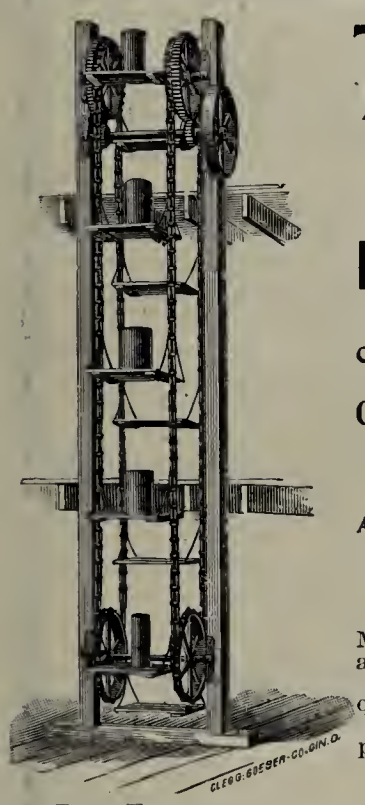
BRICK MOULDS



Of every kind and description. We make a specialty of Brick Moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.

Don't fail to get our prices. (Telephone 1084.) **1510 W. Washington St., Indianapolis.**



TILE ELEVATOR.

The Jeffrey Manufacturing Co.,

Columbus, Ohio, U. S. A.

ELEVATING--CONVEYING MACHINERY.

CONVEYORS FOR HANDLING
Green Tile,
Brick,
Sewer Pipe,
And Packages of all Description.

Chains, Standard and Special,
Sprocket Wheels,
Elevator Buckets. Elevator Boots,
Shafting, Cable Conveyors,
Hangers, Apron Conveyors,
Pulleys, Spiral Conveyors.

We make Elevators, Conveyors, Carriers, Power Transmission Machinery and all sorts of Labor Saving, Profit-producing appliances for use in and around Tile Mills, Brickyards, etc., etc.

We also submit designs and build machinery to meet special requirements in the lines named above.

Write to us for estimates, before placing your order. We can probably save you some money.

SEND FOR CATALOGUE.

NEW YORK OFFICE, 41 Dey Street.

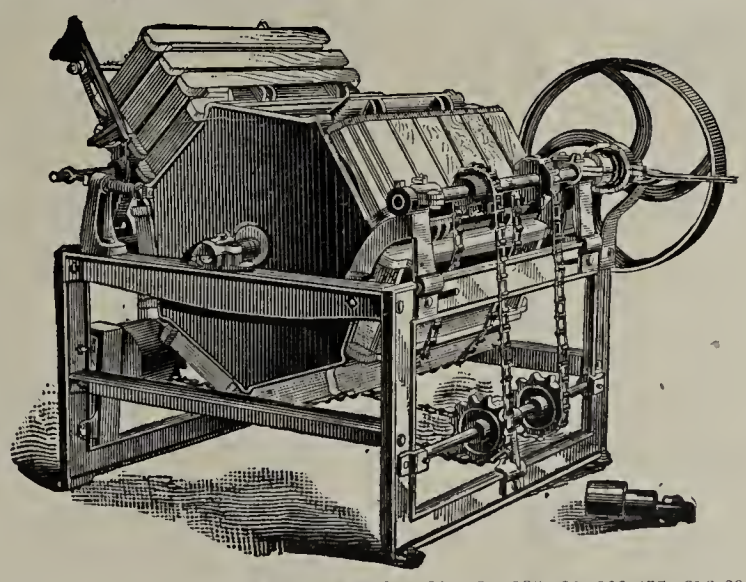
CHAMPION Brick Mould

SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent.
H. W. FULLER, Gen'l Pass. Agent,
CINCINNATI, OHIO
WASHINGTON, D. C.

The VANDALIA LINE

The Short Line for St Louis and the West.

Leave Indianapolis.		Arrive at Terre Haute.	Arrive St. Louis
No. 15	7:25 am,	9:55 am	5:00 pm
No. 5	7:15 am	9:10 am	1:45 pm
No. 21	12:35 pm	2:37 pm	7:12 pm
No. 11	7:05 pm	9:05 pm	1:44 am
No. 7	11:20 pm	1:25 am*	7:00 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No, 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.

All trains carry first-class coaches.

12:40 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent,
E. A. FORD, G. P. A. Indianapolis, Ind.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 2:30 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 11:55 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY.

Lv Indianapolis, 3:40 am, 8:05 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades.
Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING.

SYRACUSE, N. Y.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO.,
Publishers,
INDIANAPOLIS, IND., U. S. A.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
TELEGRAPH OFFICE,
WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

J. L. HIGLEY & CO.,

CANTON, OHIO.

Four of the largest and best paving brick plants in the world.

Canton Paving Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.
Write for prices.

T. B. McAVOY, President.
FRANK B. McAVOY, Sec. and Treas.

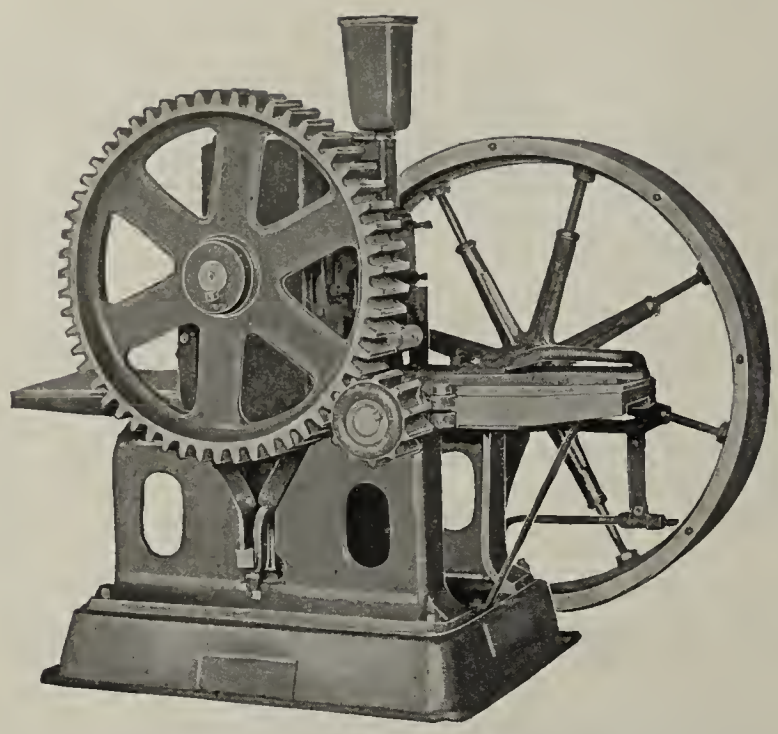
McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 Arch St., Philadelphia.
WORKS:—Perkiomen Junction, Penn.



The Steele Repress,

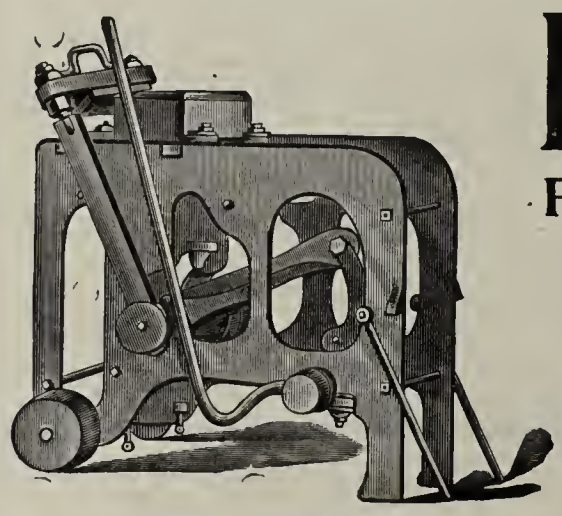
Price $185.00.

This is a very compact, strong and easily operated Press designed for the large number of yards which have more or less local demand for repressed brick which they are now filling with Hand Presses.

The compactness of this machine makes it almost impossible to break it, at the same time reducing the cost to very little more than hand press. A number of them have been in operation the past season giving perfect satisfaction.

> Fletchers, N. C., Oct. 27, 1899.
> Messrs. J. C. STEELE & SONS, Statesville, N. C.
> Relative to the Repress we are making 12 M brick per day and it works first rate with a standard paving die.
> Yours truly,
> ASHEVILLE BRICK & TILE CO.

J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**

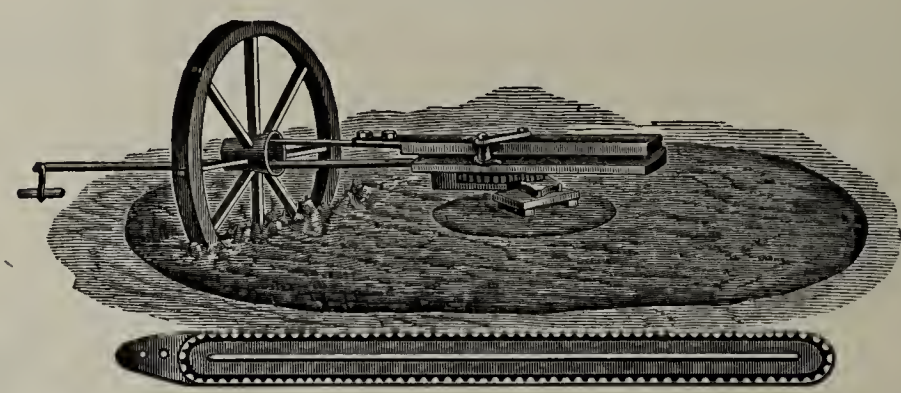


RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

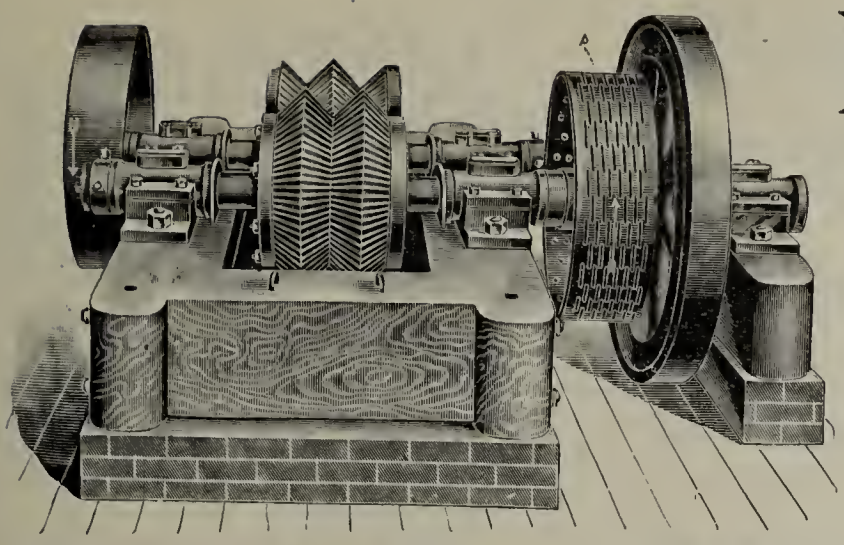
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



NEWELL CRUSHER.

Successfully crushes any and all kinds of Clays, preparing same for Brick, Tile or Terra Cotta. Fully guaranteed. Fast shaft fitted with Para Pneumatic Pulleys, increasing power of the belt, and efficiency of the crusher.

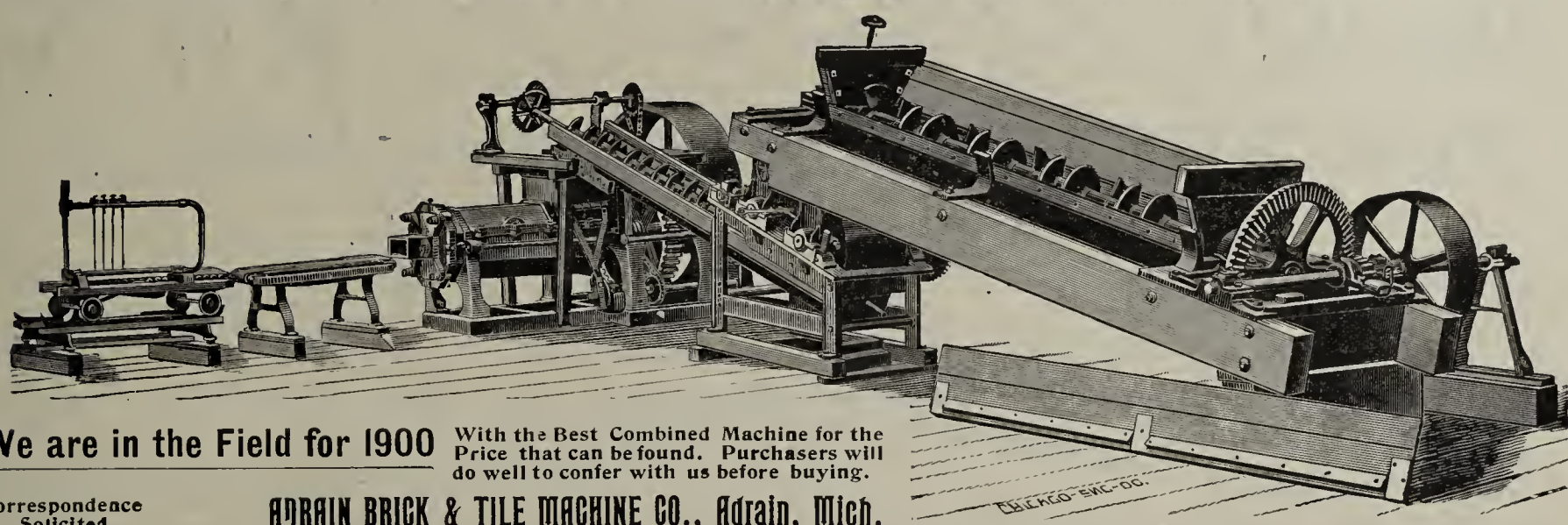
Also we equip these machines with Improved Elastic Roller Bearings when desired. These bearings greatly reduce friction thereby saving power in operating, and insuring an always cool journal.

Our Crushers will do the work where others fail. Prices reduced Quality maintained.

Extract from a recent letter from the Frontier Brick Works, Niagara Falls, N. Y., "THE CRUSHER RUNS FINELY, AND IS ENTIRELY SATISFACTORY."

Write us for price and particulars, stating capacity wanted.

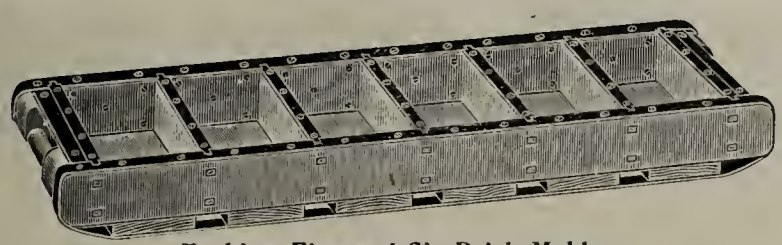
DUPLEX HEATING & MACHINE CO. L'td. Successsors to Newell Universal Mill Co. 534 West 22d. St., NEW YORK.



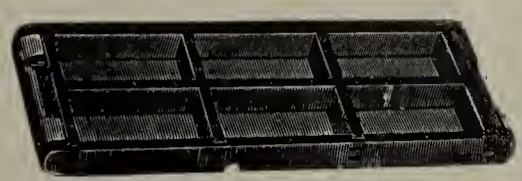
We are in the Field for 1900 With the Best Combined Machine for the Price that can be found. Purchasers will do well to confer with us before buying.

Correspondence Solicited.

ADRAIN BRICK & TILE MACHINE CO., Adrain, Mich.

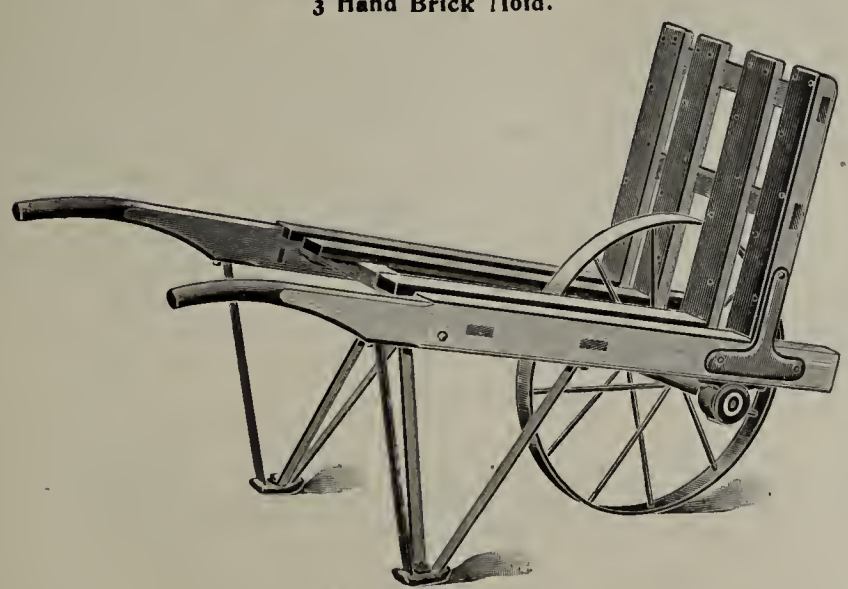


Machine, Five and Six Brick Mold.



6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

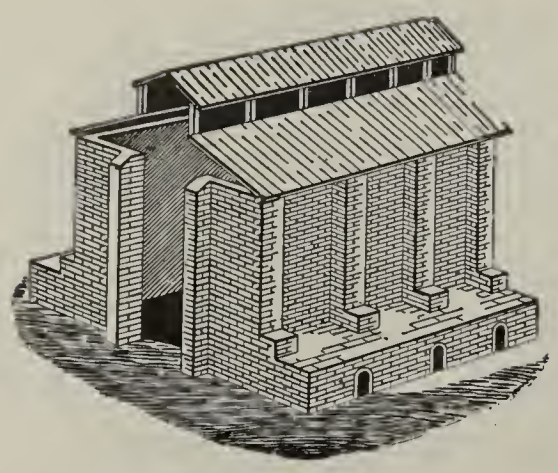
BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

D. J. C. ARNOLD,

New London, O.

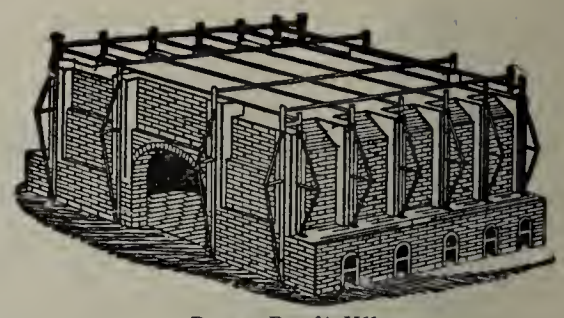


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, 2,422 Chestnut St., *Kansas City, Mo.*

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

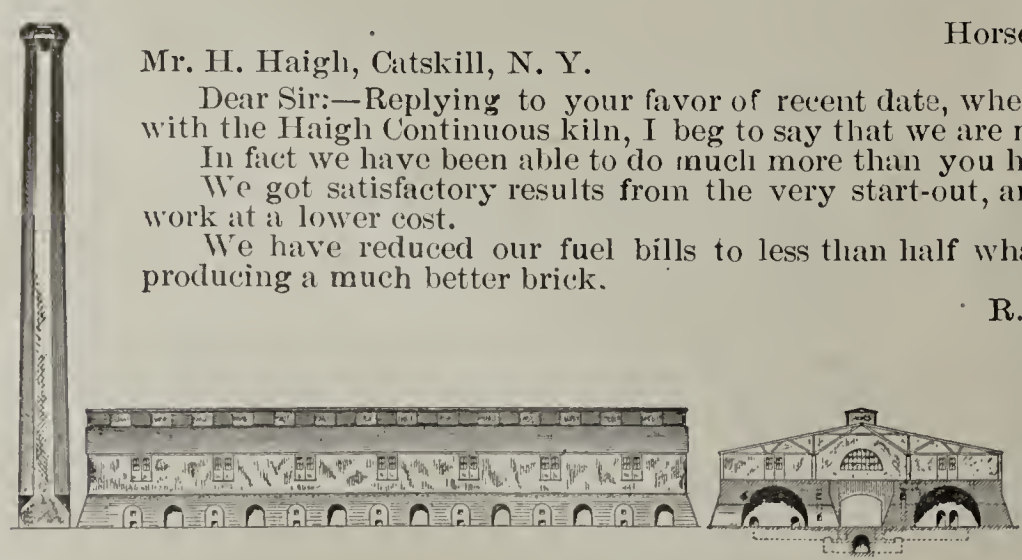
R. B. MORRISON & CO.,

P. O. Box 335. *ROME, GA., U. S. A.*

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile, Paving Brick and Common Building Brick.



Horseheads Brick Co., N. Y., August 13, 1899.

Mr. H. Haigh, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success.

In fact we have been able to do much more than you had guaranteed the kiln would do.

We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

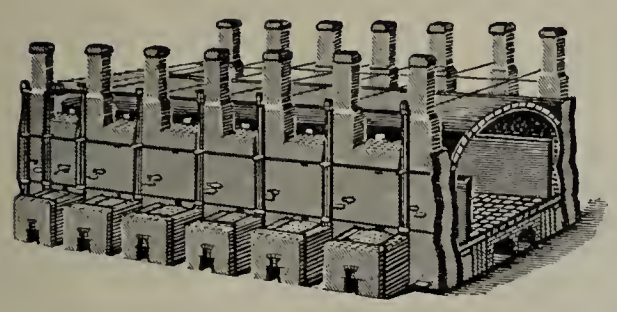
We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours,
R. G. EISENHART, Treas. and Gen. Man.

This kiln has now been in operation nearly three years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at $2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.

Address **H. HAIGH, Catskill, N. Y.**

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Oaks, Pa., January 26, 1900.
M. M. BUSHONG, Phoenixville, Pa.

Dear Sir:—Your letter of inquiry of the 25th inst, in regard to kiln received; in reply will say it gives us great pleasure to say that your kiln is doing splendid work, we have made eleven (11) burns and they were all a great success, in fact it surpassed our expectations in every particular, both to quality of paving brick produced and the amount of coal consumed and we contribute its success to the perfect system of drafts and absolute control of same. In other words if your kiln does not burn evenly from top to bottom or wall to wall it is the fault of the man in charge and not the kiln.

We have had a wide experience in the kiln line and do not hesitate to say that your kiln is the best for burning Shale Paving Brick to be found.

We can assure you that in the future should we build more kilns they will be the **Bushong Down Draft.** Wishing you success we remain,

Yours respectfully,
PERKIOMEN BRICK CO.,
Per HAGGINBOTHAM, Supt.

BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.

These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

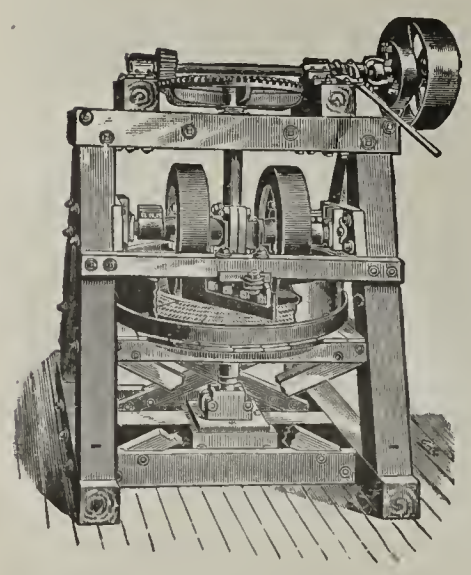
The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

OUR SPECIALTY IS

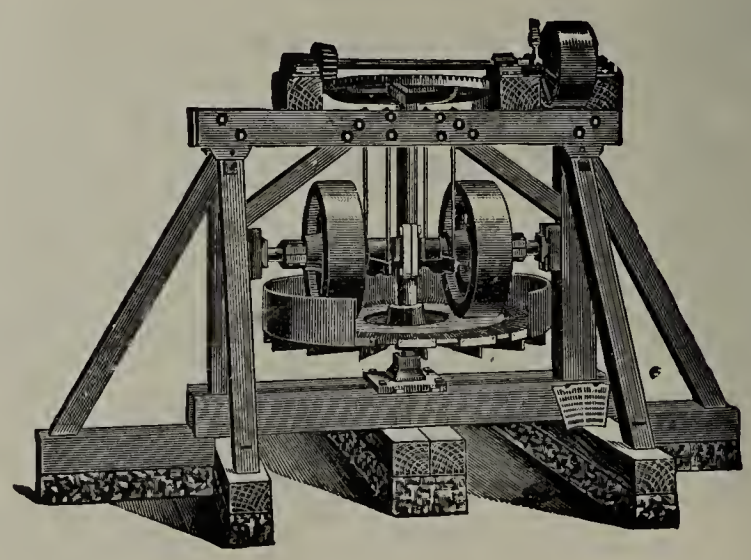
DRY PANS.



IRON FRAMES,

WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

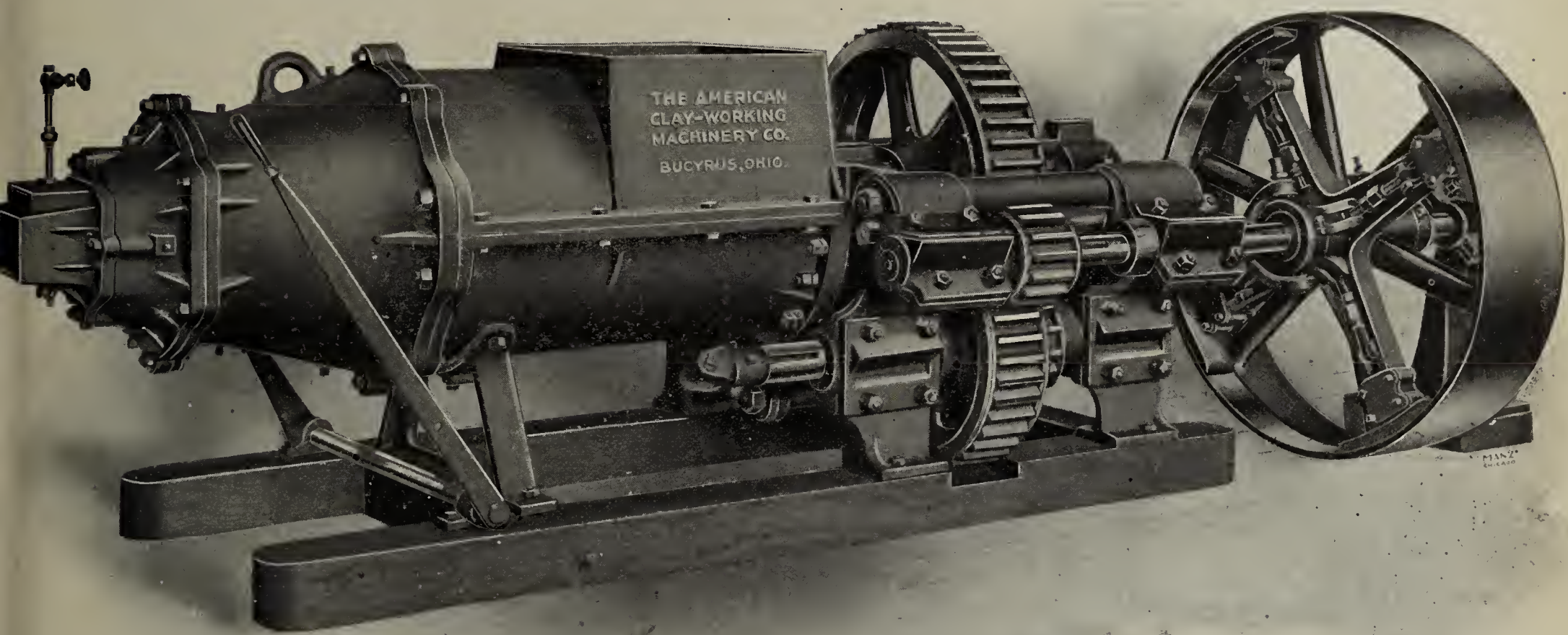
FROST ENGINE CO., Galesburg, Ill., U. S. A.

The Bucyrus Giant No. 1.

....

Built Right Run Right.

THE THREE VITAL POINTS in successful machinery are possessed by the No. 1 GIANT. It has great strength, great capacity and great durability. Not only these but its product is without a flaw. A greater per cent of perfect brick are made on the GIANT than on any other machine. If you want a permanent success you will find your money well invested in the GIANT. Send for full description.

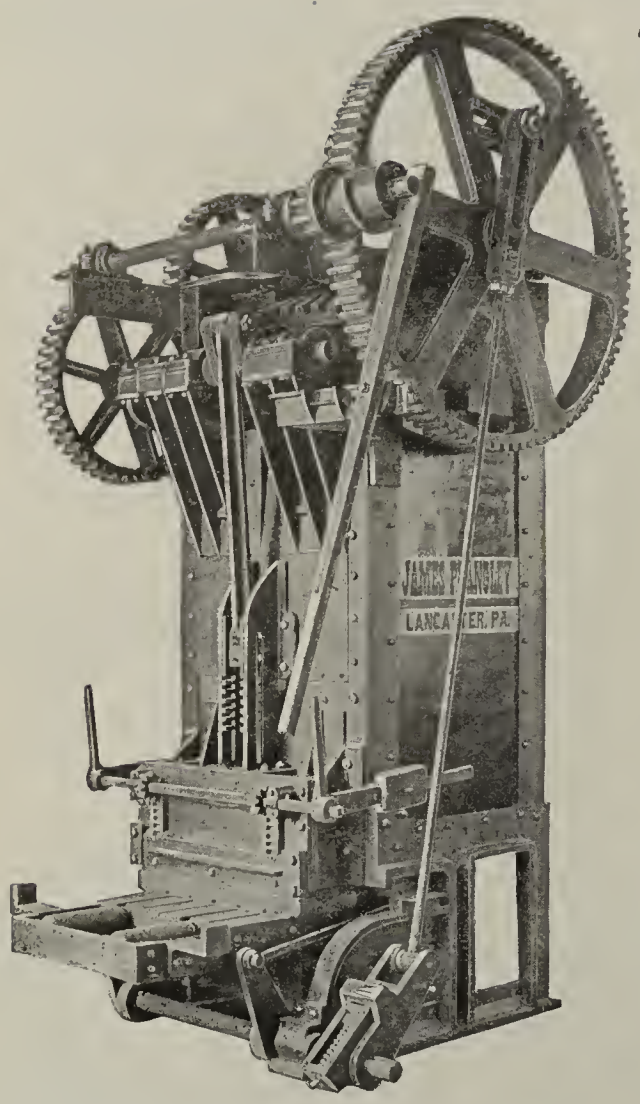


We build a hundred other clay-working machines, all the best in their line. Every one is fully illustrated and described in our new 1900 catalogue just issued. If you are interested, write for one. If you contemplate improvements, mention it when you write. Write today, tomorrow never comes.

We build the **Bucyrus Steam Tunnel Dryer.** It removes more moisture with less fuel than any other dryer built.

The American Clay-Working Machinery Company,

Bucyrus, Ohio, U. S. A.



The Prangley Brick Machine.

BUILT TO LAST A LIFE TIME.

Large Capacity. Molds Brick Very Stiff. Pug-Mill Not a Necessity, Will Work Clay Direct From Bank.

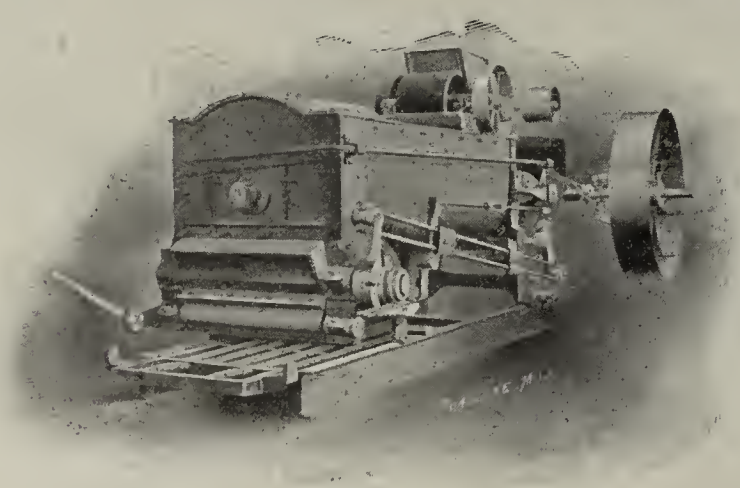
This Machine is constructed on practical lines by Mr. James Prangley, a successful brickmaker of thirty years experience. The tempering knives are of solid steel, and the press box is lined with steel, making it the most durable machine on the market. Brickmakers who buy the Prangley Machine will get their money's worth. Manufactured by

JAMES PRANGLEY,

Office 666 West Chestnut St.,

LANCASTER, PA.

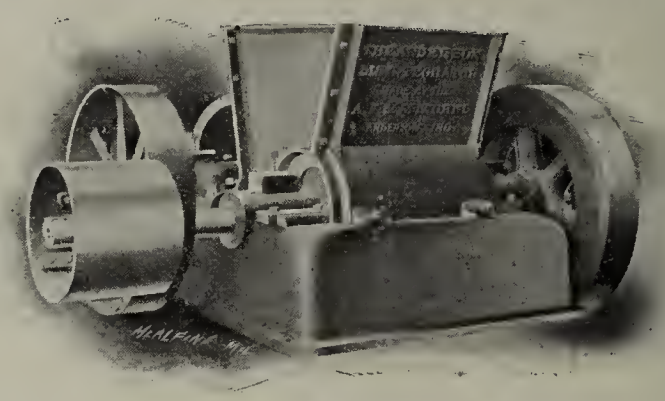
Write for Prices, etc., to
EDWARD C. HUHN,
Sole Selling Agent, 1215 Filbert St., Philadelphia.



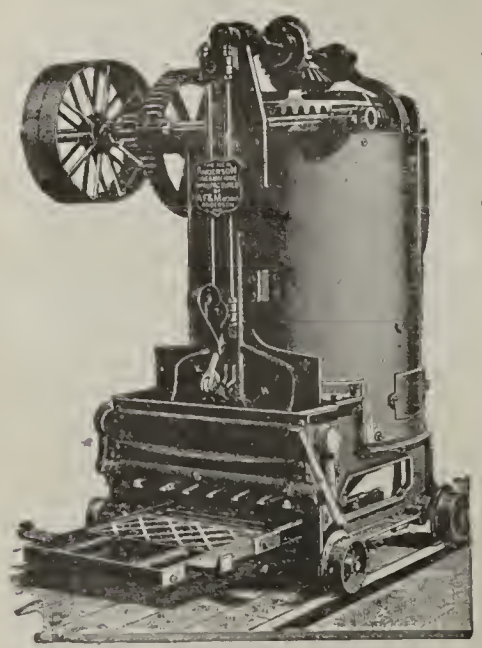
Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



Best Disintegrator on the Market.



Steel and Iron Upright Stock Brick Machine.

MANUFACTURERS OF....

New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.

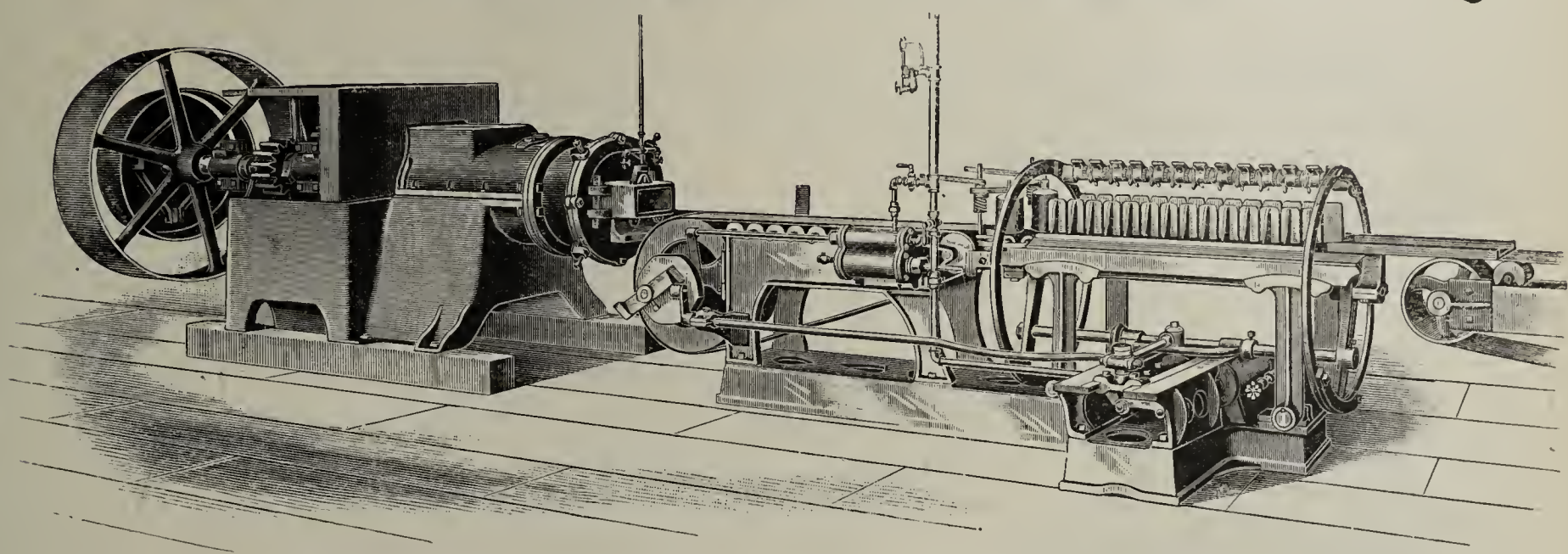
1899 Horse Power Machine.

The Anderson Foundry and Machine Works,
Anderson, Ind.

You Obtain More for Your Money

(When Purchasing)
(While Using)

Leader Machinery

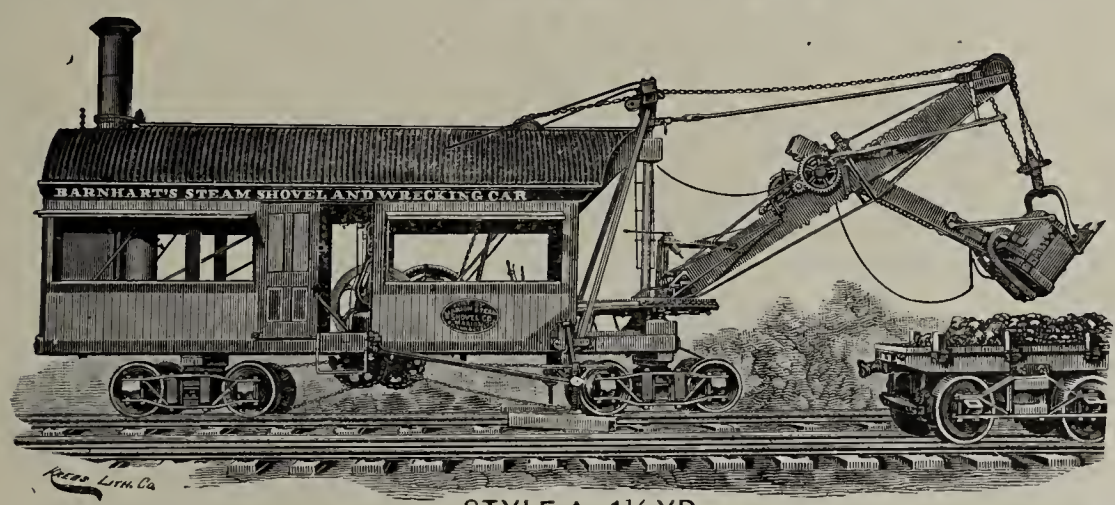


Leader No. 25 with Side Cut Die and Automatic Cutter.

LEADER MACHINES are most economical because they are properly designed and well built. They do good work with least waste. Printed matter illustrating and describing **Leader Brick Machines, Pug Mills, Crushers, Presses,** etc., free.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

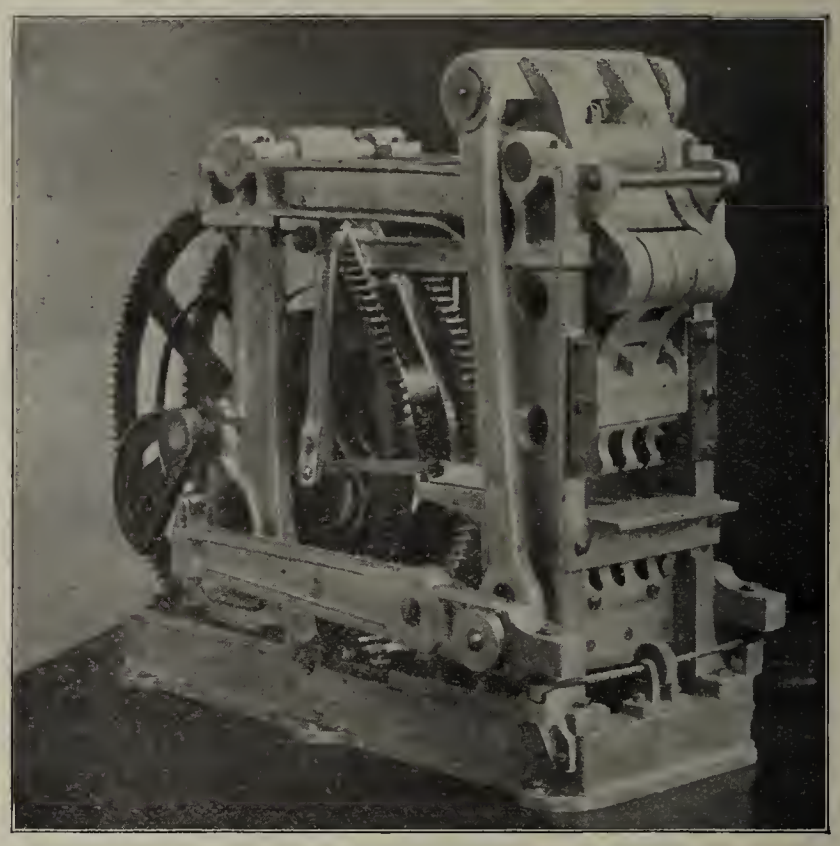
The Marion Steam Shovel Co.,

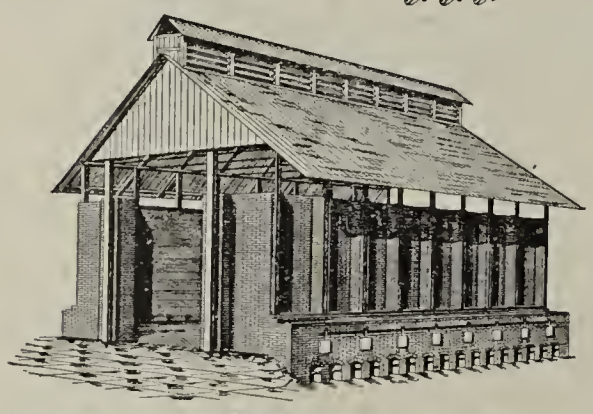
603 West Center Street, - MARION, OHIO.

The GRATH Brick Press.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

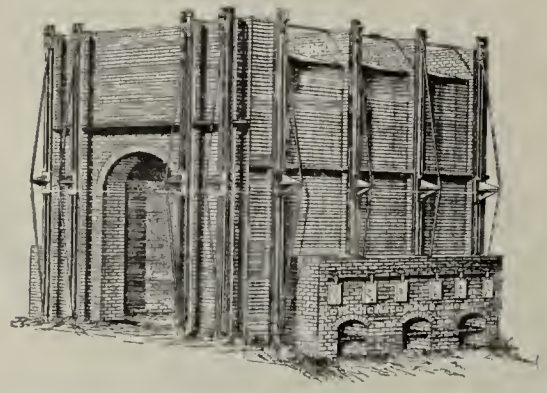
1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Operated with less Horse-power than any other Press.
5th. It makes Brick free from Granulation or Seams.
6th. It fs Adjustable.
7th. All Bearings Bushed.
8th. Master Wheels. Close to Bearings.
9th Thickness of Brick Changed without Stopping Press.
10th. All parts easily Accessible.





The Grath Up-Draft Kiln

WITH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with nothing but cheap slack, and with better results than by using lump coal in ordinary Furnaces.



GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH SLACK COAL, GAS and COKING FURNACE ATTACHED. This kiln will burn uniformly throughout, and give perfect results, with less fuel and in less time than any other kiln. It requires nothing but Slack Coal or screenings; one ton of slack will go as far as one ton of lump coal. For burning face brick, fire brick, roofing tile, drain tile, sewer pipe, pottery and white ware.

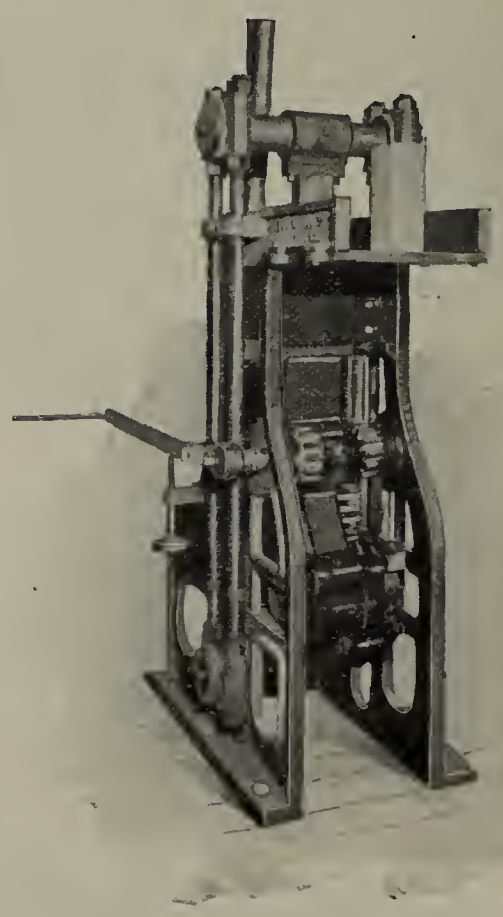
The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK AND TILE.

The only Successful Press of its kind in the Market

GUARANTEED TO GIVE SATISFACTION.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.



The Grath Brick Grinding Machine

FOR GRINDING ARCH AND AND RADIUS BRICK OF ANY HARDNESS, EVEN TO A VITRIFIED BRICK.

Simplest, Best and Cheapest Grinding Machine in the Market. Used by the American Hydraulic Press Brick Company.

FOR FURTHER INFORMATION ON ABOVE, ADDRESS

Mention The CLAY-WORKER.

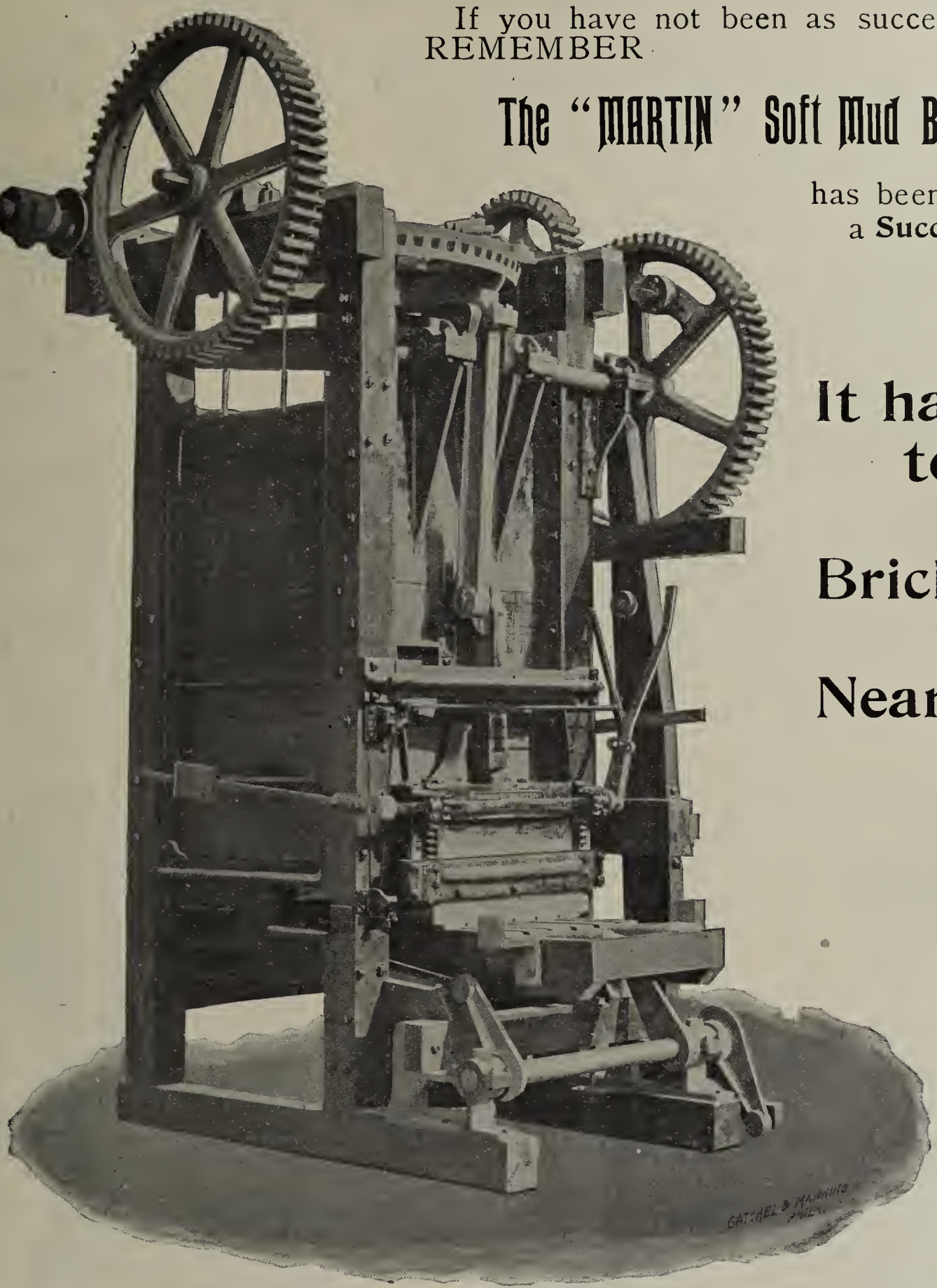
The Illinois Supply & Construction Co., St. Louis, Mo.

Start the New Year Right.

If you have not been as successful as many others REMEMBER

The "MARTIN" Soft Mud Brick Machinery

has been the making of many a **Successful Brickmaker.**



It has stood the test of Brickyard life for Nearly half a Century.

Up-to-Date Equipments are OUR Specialty.

We Furnish Everything a Brickmaker Needs.

Our new Catalogue contains much useful information.

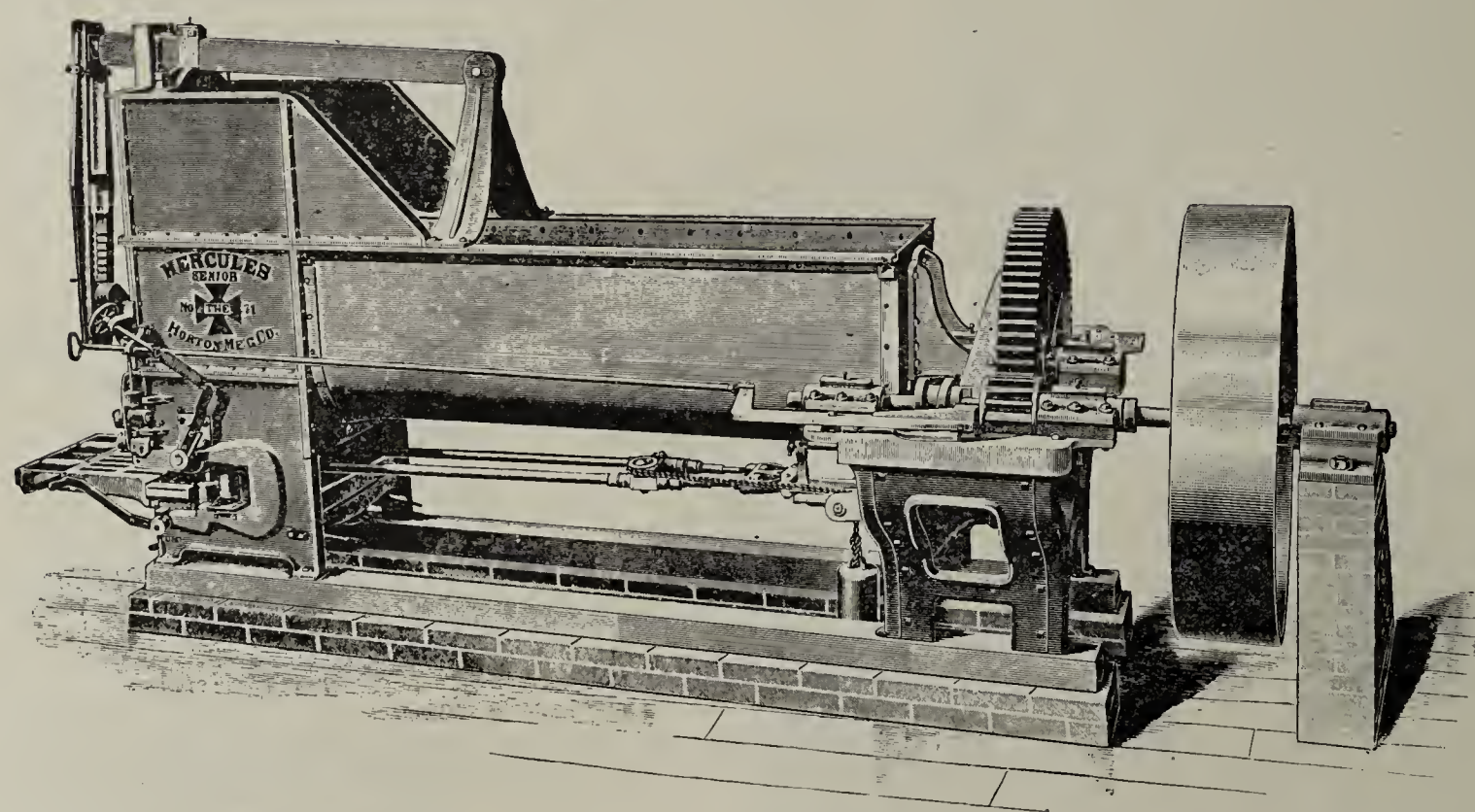
THE HENRY MARTIN BRICK MACHINE MFG. CO., INCORPORATED.

Sole Manufacturers of the "Martin" Patents,

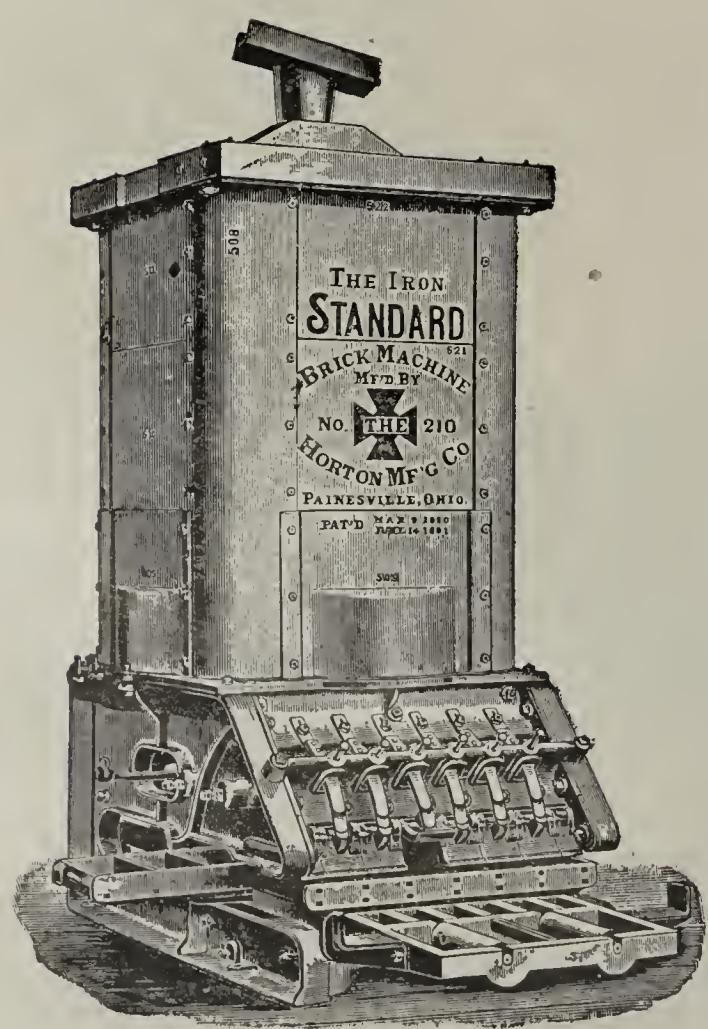
LANCASTER, PENN., U. S. A.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES



IRON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brick-yard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

THE "MOCK"

Force Feed, Double Press

BRICK MACHINE

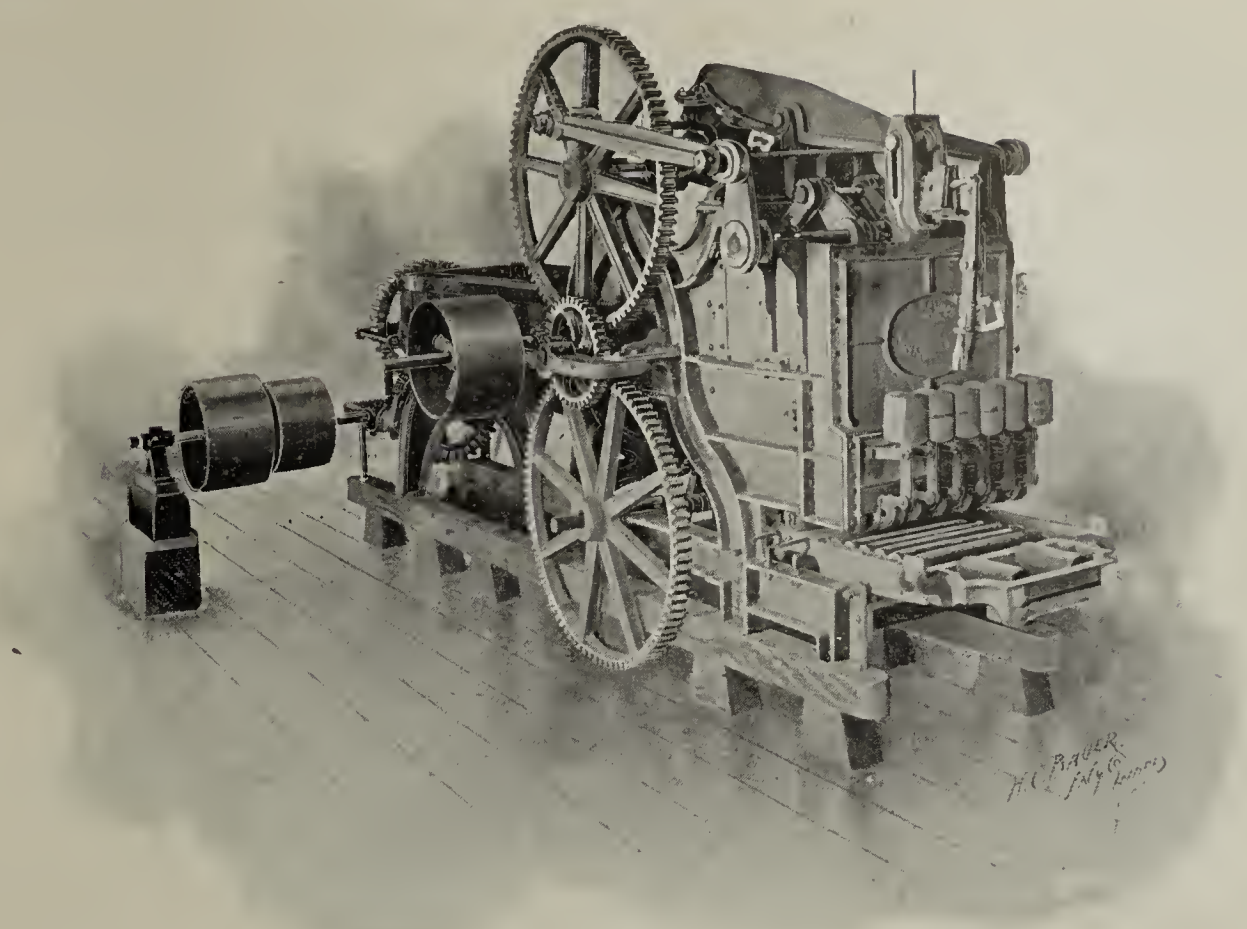
ALL IRON AND STEEL

Twenty-four revolutions of the Press Pulley to each single conjunctive application of the Presses.

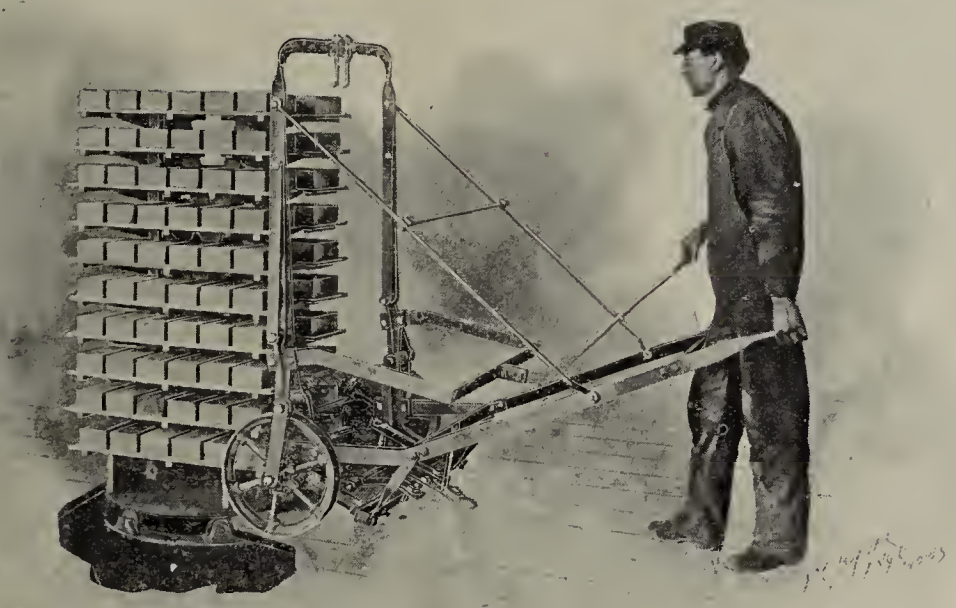
Journals, Cog-Wheels, and Belts are shielded from wear by the ponderous Back Gear and Fulcrum advantages employed in driving the Presses.

Twelve revolutions of the Pug Pulley to one of the Pug Shaft means relief to the wearing parts.

Two or more revolutions of the Pug Shaft to each mold delivered commands PERFECT TEMPERING.



BRICK MACHINE No. 1. (Inside Press.)



LOADED RACK WITH TRUCK.

The "MOCK"

Patented Portable Rack and

PALLET SYSTEM.

Simple—Satisfactory—Inexpensive. Applied to our

Sun Drier, Direct-Heat Gas Drier

OR

TROLLEY-RACK TUNNEL DRIER

For Gas, Coal or Coke.

PLANTS OF ANY CAPACITY.

Let us Figure with YOU.

THE LOADED RACKS are conveyed from machine to place of drying by one man, using one Truck. When the brick are dry a similar Truck conveys the Racks of brick to the kilns; thus the brick are not disturbed nor touched by hand until they are tossed to the Setters.

The Empty Racks are conveyed from the kilns back to the machine by a small boy, using the empty-rack truck.

The number of Racks needed depends upon the output.

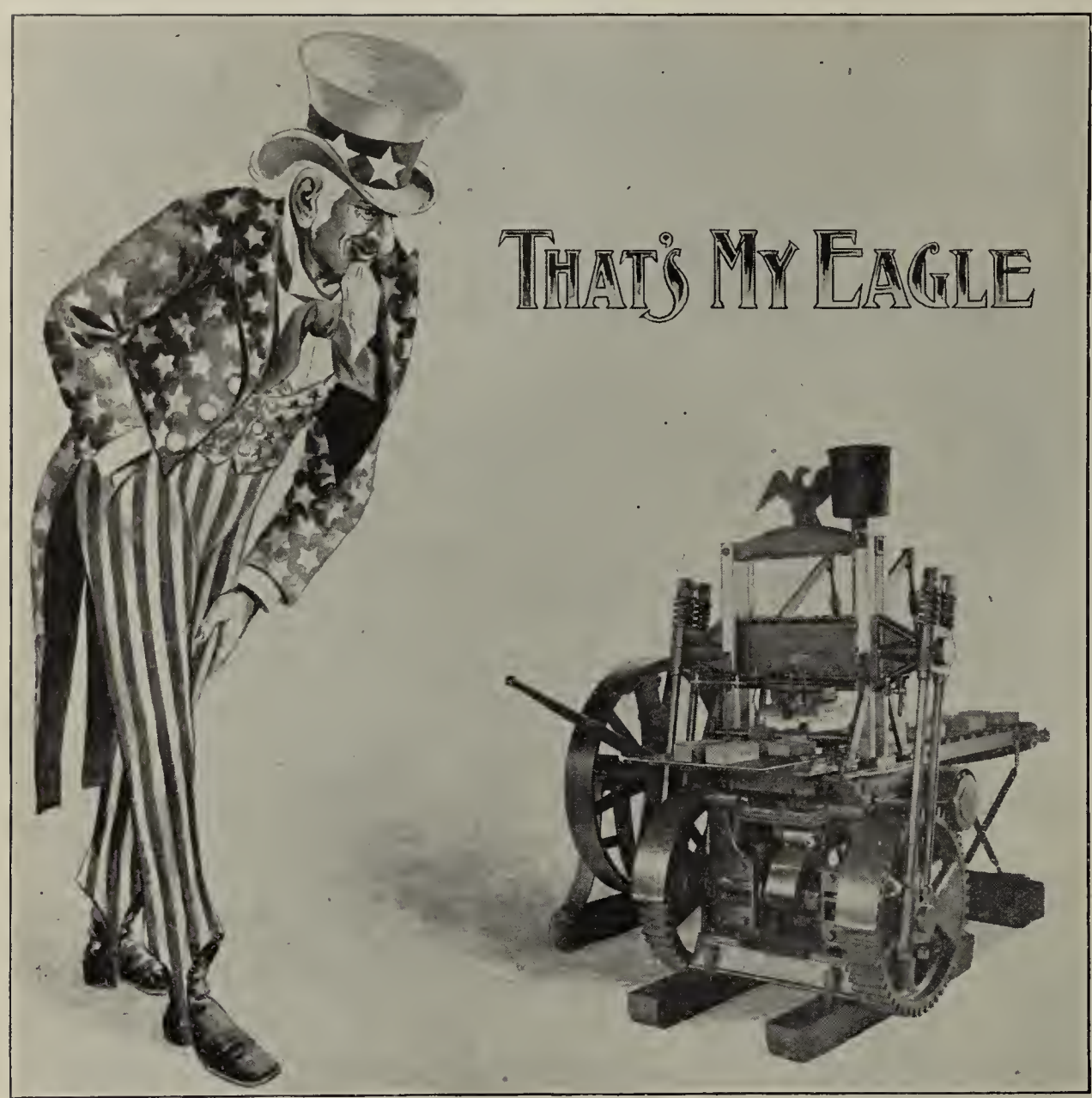
Two Turn-tables, one at each side of the dump-table, are set flush with the floor, as shown in the above illustration, for convenience in turning the Racks about while loading.

EMPTY RACK WITH TRUCK.

Write for No. 3 General Catalogue.

Jas. F. Mock & Co.,

Hartford City, Indiana, U. S. A.



WHY IT WINS.

The only Repress giving unquestioned satisfaction.
The only Repress never thrown out for incompetency.
The only Repress receiving the unanimous approval of the trade.
The only Repress with a record of nine in one factory
The only Repress with a record of constant use for years without a cent for repairs.
The only Repress that "Never Dissappoints."
The only Repress without a superior.
The only Repress built for service rather than to sell at a profit.
The only Repress where the profit is greater to the buyer than the manufacturer.

Built Right Run Right.

THE HISTORY of the **Eagle Repress** can be given briefly; From its first conception it has been a success, growing in favor and gaining in popularity as it became better known. Not a single machine in the clay-working line from New York to San Francisco is so well known as the **Eagle Repress,** and none can approach it in its record of success. There are no **Eagles** which are not a credit Each one is a success, each owner a satisfied advocate of the **Eagle's** greatness. The record of **The Eagles** is but a duplicate of every machine we have built. The superiority of the principles upon which they work, abundantly protected by patents, is the ground work upon which our success is built. The excellence of the material embodied in their construction, the watchful care with which each part is manufactured, the attention given to each minor detail, the rigidness of tests before shipping, all combine in placing in your plant, ready for operation, machinery from which you may confidently expect to get full satisfaction. There are no machines which will do as much work in a given time, and do it so well, as ours. Have you used any of our machines? If you have you know their worth. If you have not we can give you testimonials from those who have been successful and who attribute a part of that success to our machinery.

We manufacture all classes of machinery for manufacturing Dry Press, Stiff Mud and Soft Mud products, and give careful attention to special machinery. A postal and a minute will bring you a reply.

OUR NEW CATALOGUE FOR THE ASKING.

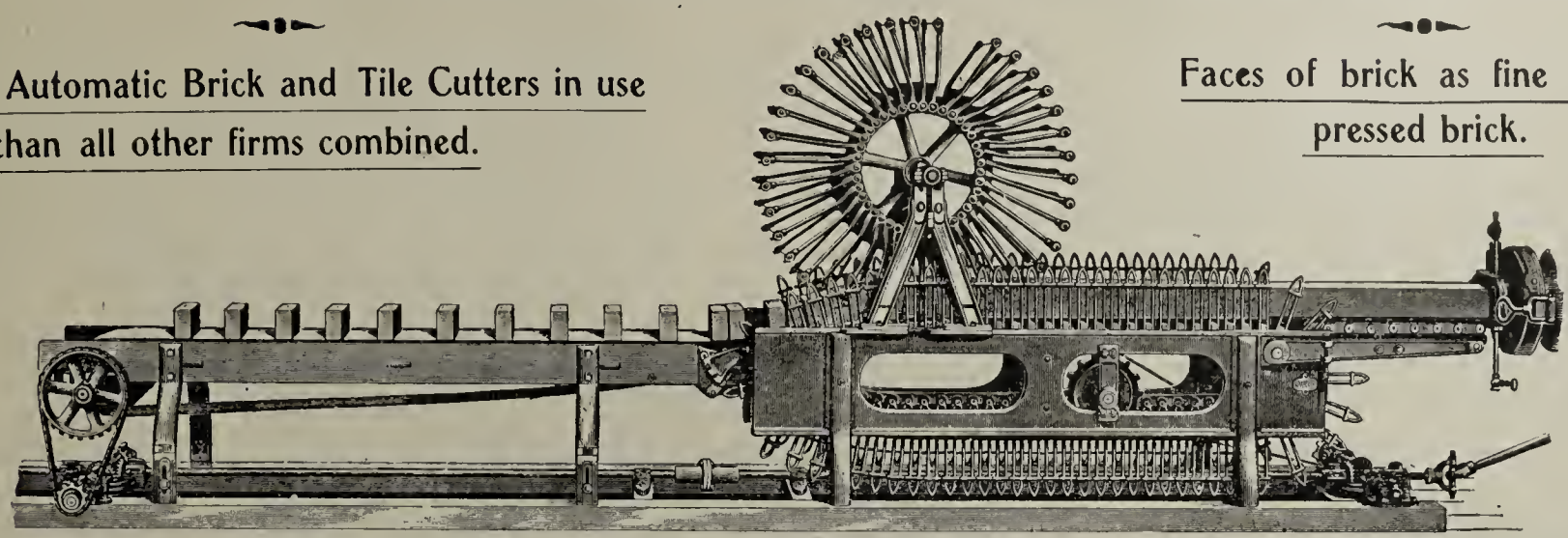
The American Clay-Working Machinery Company,

BUCYRUS, OHIO, U. S. A.

The Only ABSOLUTE DOWN CUT Cutting Table on the Market.

More Automatic Brick and Tile Cutters in use than all other firms combined.

Faces of brick as fine as re-pressed brick.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Correct in principle and mechanism.

Simplicity itself—nothing can get out of order unless broken by carelessness.

Strong and of long life—all its motions being continuously rotary.

The parts work together without jarring.

There is no halt or hesitation—every motion is prompt and positive.

Requires no expert to keep it running or in repair.

The column of clay, assisted by friction, runs the table, but all movements are regulated by clay column. When the column goes, table moves, and stops when it stops.

Breaks less than one-tenth the cutting wires that others do, and if wires are broken may be easily replaced without stopping.

The brick cut are square and true, with sharp edges and corners, and equal to the finest Press Brick.

The first brick is as good as the last, and the last as the first.

Cutting capacity practically unlimited.

READ WHAT USERS SAY:

J. D. FATE & CO., Plymouth, Ohio. Memphis, Mo., October 12, 1899.

Gentlemen:—We have been using your **Automatic Side Cut Brick Table** for two years, and are now ready to tell you what we think of it. It is beyond a doubt the superior of any other cutter now on the market for fine work, regularity in operation, self adjustment to any capacity, and last of all, **Durability.** In using other cutters, we were obliged to use either oil or water to prevent the bar of clay from sticking to parts of the table. With your Automatic table we use nothing of the kind. We simply throw the clay into the machine and the machine does the rest. The brick are all cut even and with perfect face and edges, and are delivered onto the off-bearing belt in first class shape. Our table would cut 100,000 brick per day if we made them that rapidly, but adjusts itself to our 20,000 per day without any work on our part. Yours truly, MEMPHIS BRICK & TILE WORKS.

J. D. FATE & CO., Plymouth, Ohio. Salt Lake City, Utah, October 11, 1899.

Gentlemen:—Yours of the 3rd inst., at hand and contents noted. In regard to the **Automatic Side Cut Brick Table** purchased from you in June last, would say that we deem it **Perfection Itself.** We make from 35,000 to 60,000 brick per day, as our needs require. This by increasing or lessening the speed—the result from either speed is the same in quality. Our material is pulverized, screened and pugged, and works smooth and after the brick are cut they are delivered onto the off-bearing belt in a perfect condition, at either speed, all of one size, well defined edges and no delay from broken wires. We would not part with the system under any **Circumstances.** We cheerfully recommend it to all brickmakers. Yours truly, THE SALT LAKE PRESSED BRICK CO.

J. D. FATE & CO., Plymouth, Ohio. Des Moines, Iowa, May 11th, 1899.

Gentlemen:—We are so well pleased with the Automatic Side-cut Brick Machine that we purchased from you this Spring that we feel it our duty to send you a testimonial. We feel safe when we say it has no equal, but we are sure when we say it has no superior, because it is perfect when it comes to making a nice, square brick. We have tried it in all kinds of clay that we have here, and it makes no difference, it runs just the same. We can now make a fancy face brick, which we could not do before. We do not use power to drive the wheel—the column of clay runs it nicely. We feel that it is the best investment we ever made. If you have any prospective customer in our neighborhood, send him to our yard to see the machine, and we will venture to say he will buy your machine.

Very respectfully yours, NEWMAN BRICK & COAL CO.

"Soft Mud" Brick Machinery, both Steam and Horse Power in addition to our full line of "Stiff Mud" Machinery. Ask for Catalogue and Prices.

J. D. FATE & CO.,

Manufacturers of

BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.

Agent for Virginia and North Carolina: H. L. JACOBS, Suffolk, Va.

NOTICE.

After nearly eleven years of litigation, during which time the case has been before the Supreme Court of the United States twice, our

Clay Disintegrator Patent

has been adjudged by the United States Circuit Court of Appeals for the Sixth Circuit to be valid and infringed.

We call attention to the following extracts from the opinion of the Court:

We do not find from the evidence that the operation of any of these (older) machines for the disintegration of clay was so successful as to lead to their general adoption by the trade or to work a change in the older and more laborious methods in preparing clay for brick machines, graphically described by Mr. Justice Brown in his opinion.

It is clearly established by the evidence that the Potts Machine is a success.

Nearly all the witnesses who testified to the contrary are prejudiced by their general interest in the litigation, and, **as infringers of complaint's patents,** are contradicted by their conduct. The weight of such evidence, moreover, is much impaired by the trade circulars issued by defendants, showing the success of machines which **infringe** and **Resemble, in every way,** the Potts machine. The operation of the Potts machine described by **Mr. Justice Brown** shows that **it embraces the rapid revolution of the cylinder with longitudinal blades upon it, arranged with reference to the mass of clay to be disintegrated, so that the knives upon the surface of the cylinder shall strike with hard blows the mass of clay and clip off or tear off from the mass presented to the cylinder bits of clay and carry them into receptacle below.**

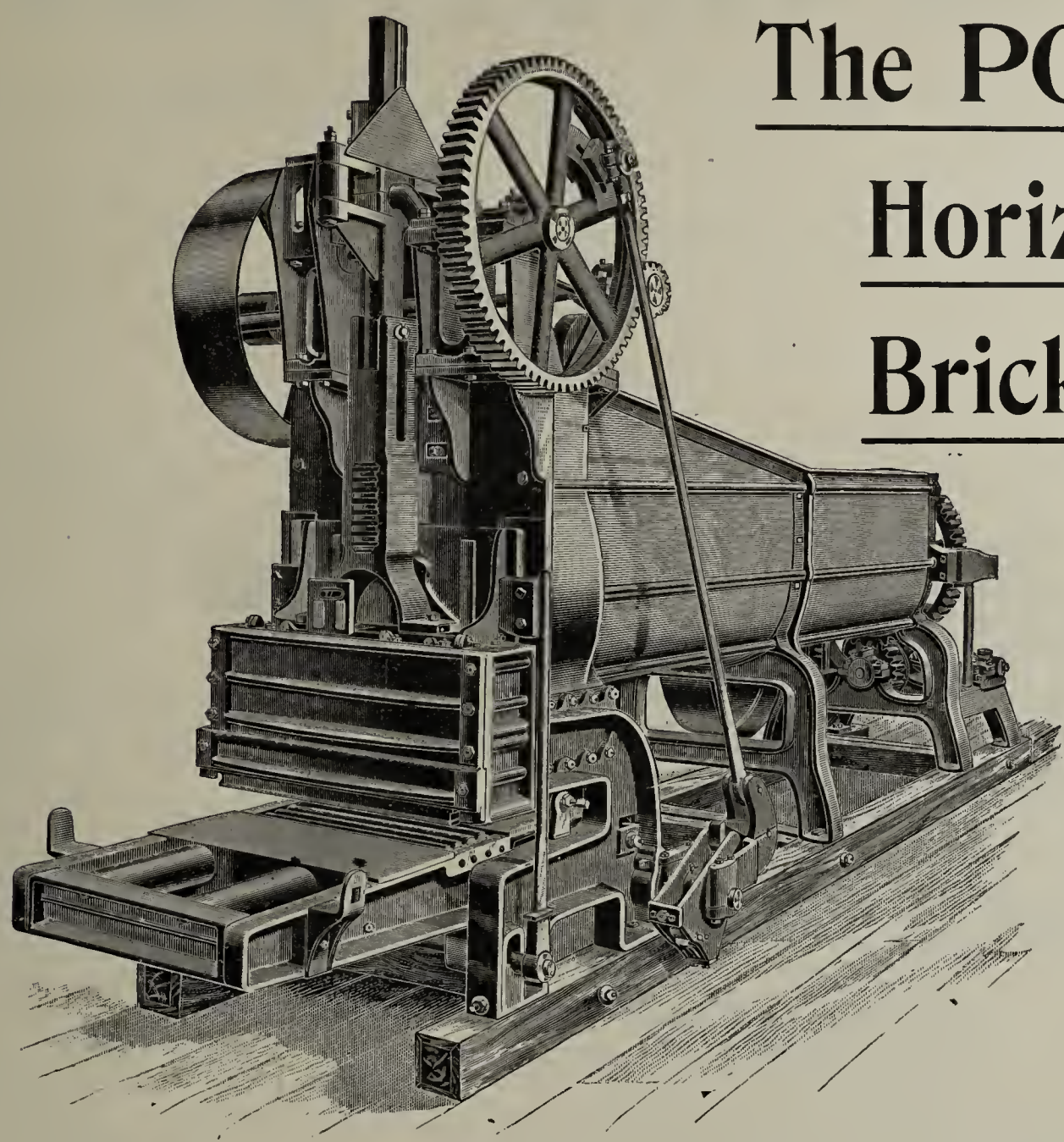
☞Our rights having now been confirmed, both by the Supreme Court of the United States, and by the Circuit Court of Appeals for the Sixth Circuit, all persons are hereby notified that we shall expect said rights to be respected, and that all infringements will be promptly and vigorously prosecuted.

Persons owning or operating infringing machines, which they have bought heretofore, will advance their own interests by promptly settling with us.

C. & A. POTTS & CO.,

Indianapolis, Ind.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

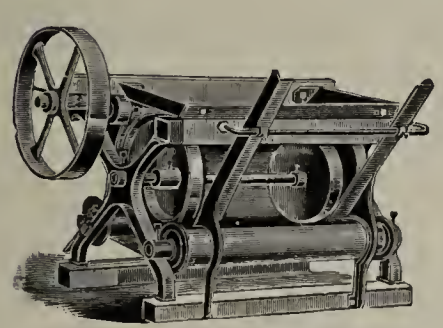
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

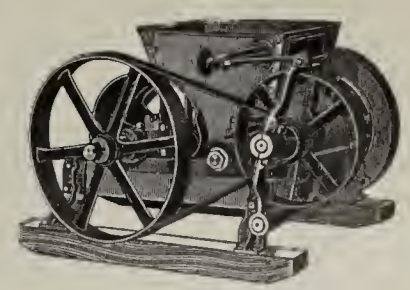
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



DISINTEGRATORS.

When in need of Machinery or supplies, we can save you money.

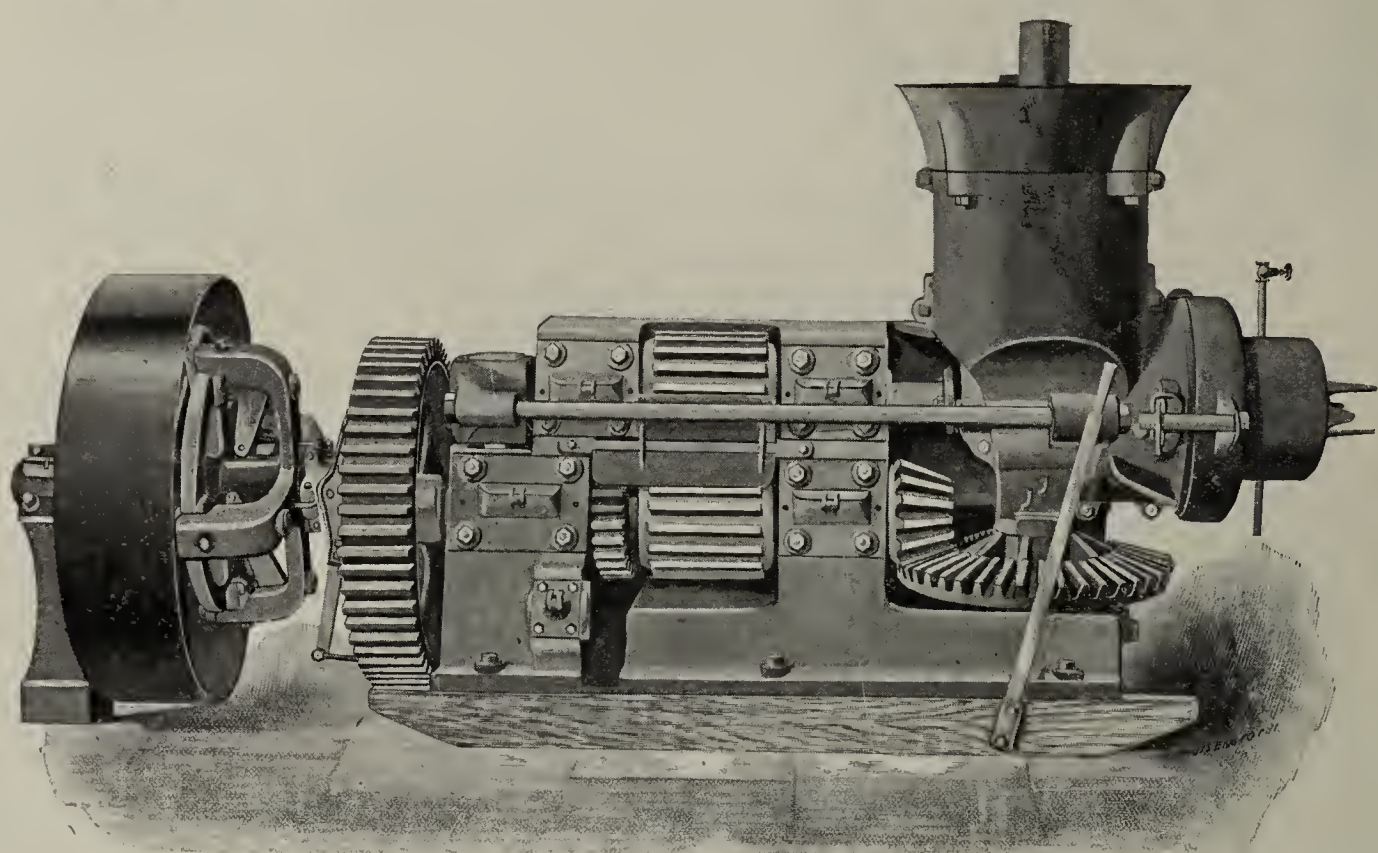
C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

The WONDER

IN WORK AS WELL AS IN NAME.



BIG WONDER BRICK MACHINE: Capa ity 60,000 Brick Per Day.

The wise man is guided in his choice of an article largely by the adaptability of same for his particular purpose.

There is something about the **Wonder Brick Machine** that appeals to the practical brickmaker. When you examine the machine you will see why, and when you use one, you will have no other.

Our strength is in our preparedness. We are in a position to handle anything that you may intrust to us in a way that will throw new light on the matters of service and quality of work.

The Wallace Mfg. Co.,

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

Frankfort,
Indiana.

SOUTHERN AGENT: Frank H. Reid, Charlotte, N. C.

TRUTH IS MIGHTY.

And the Truth in regard to Our

No. 70 Automatic Tile Cutter

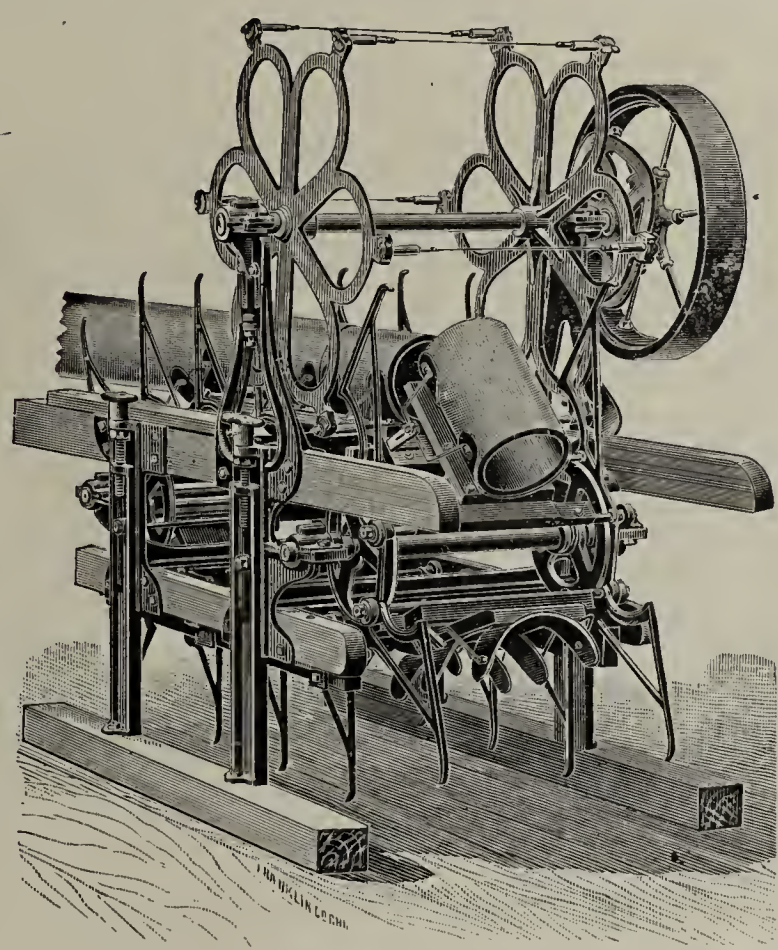
Is Embodied in every Claim we make for it.

We Claim

• • •

That it is a Simple, Efficient and Substantial Machine.

That it cuts Tile of equal length without upsetting or indenting.



We Claim

• • •

That it has a practically unlimited capacity.

That it is a time and Money Saver.

And we are prepared to demonstrate that **we mean what we say.** We can furnish these machines to responsible parties and guarantee

Satisfaction or no Sale.

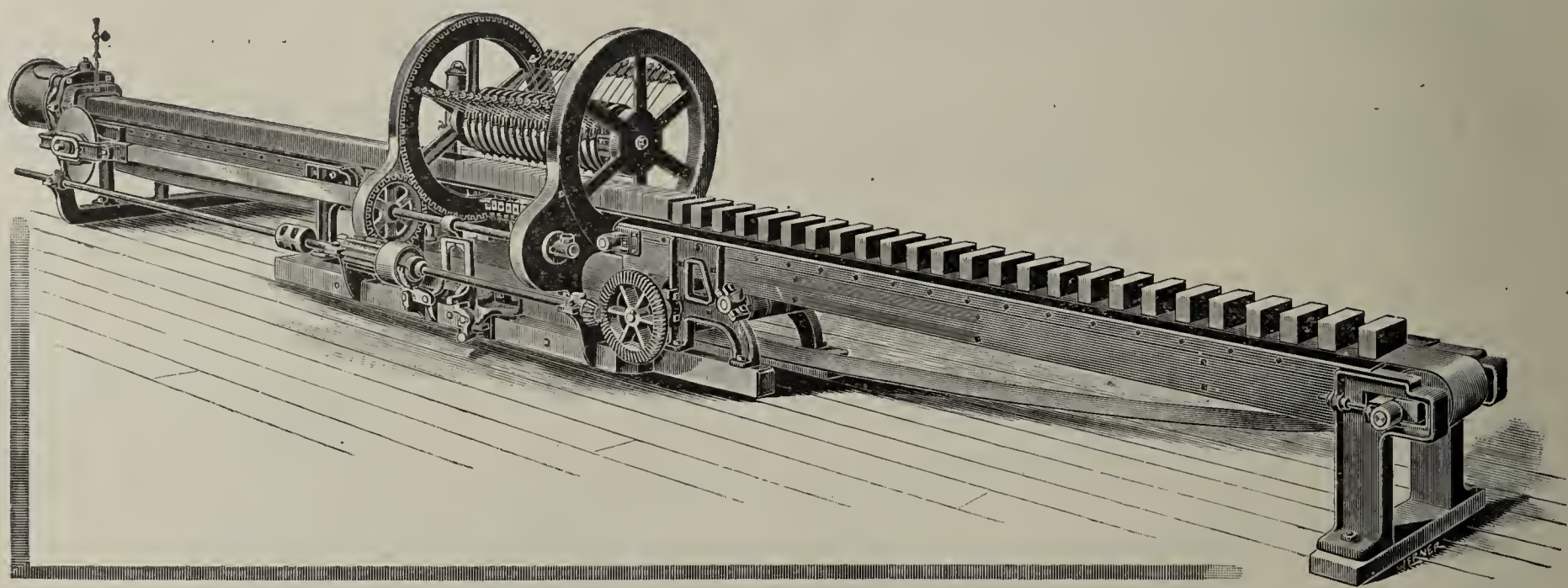
No harm can result from a little correspondence with us.

H. BREWER & CO.,

TECUMSEH, MICH., U. S. A.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

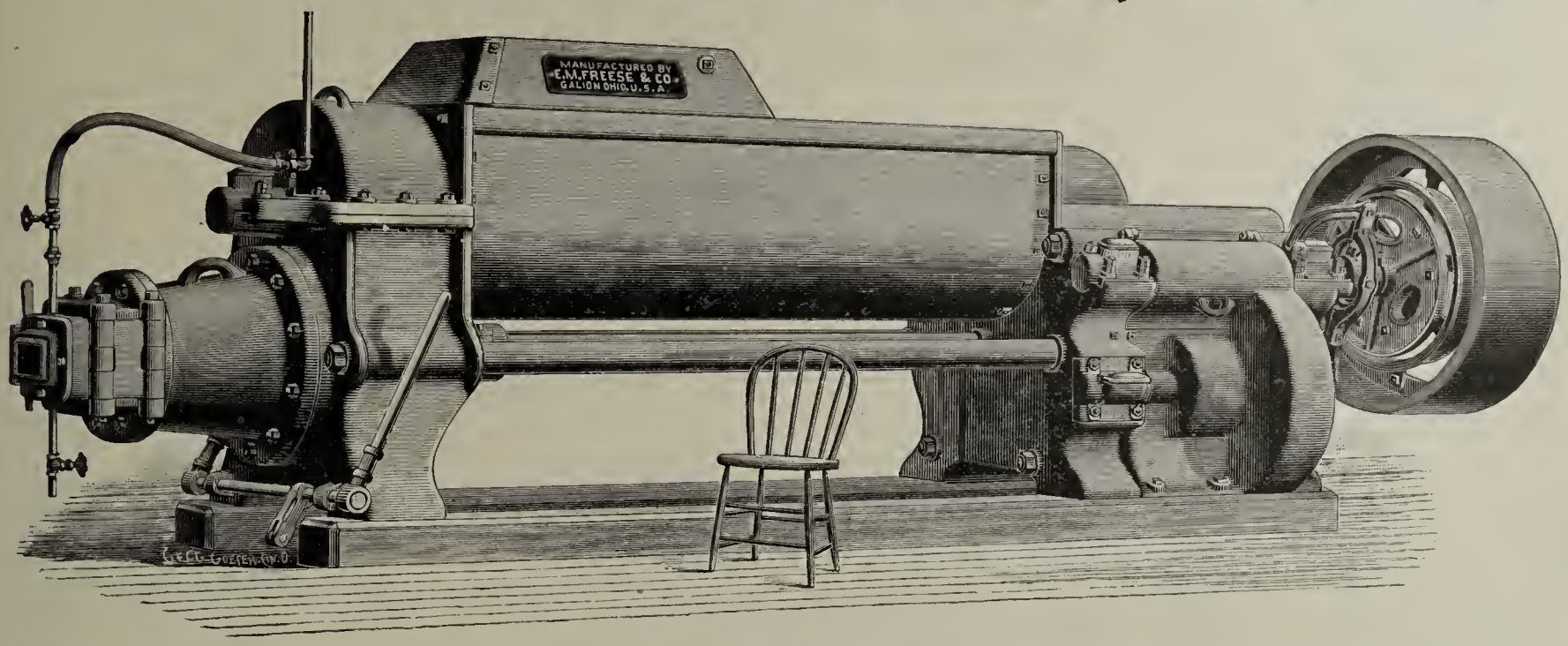
POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

E. M. FREESE & CO.,

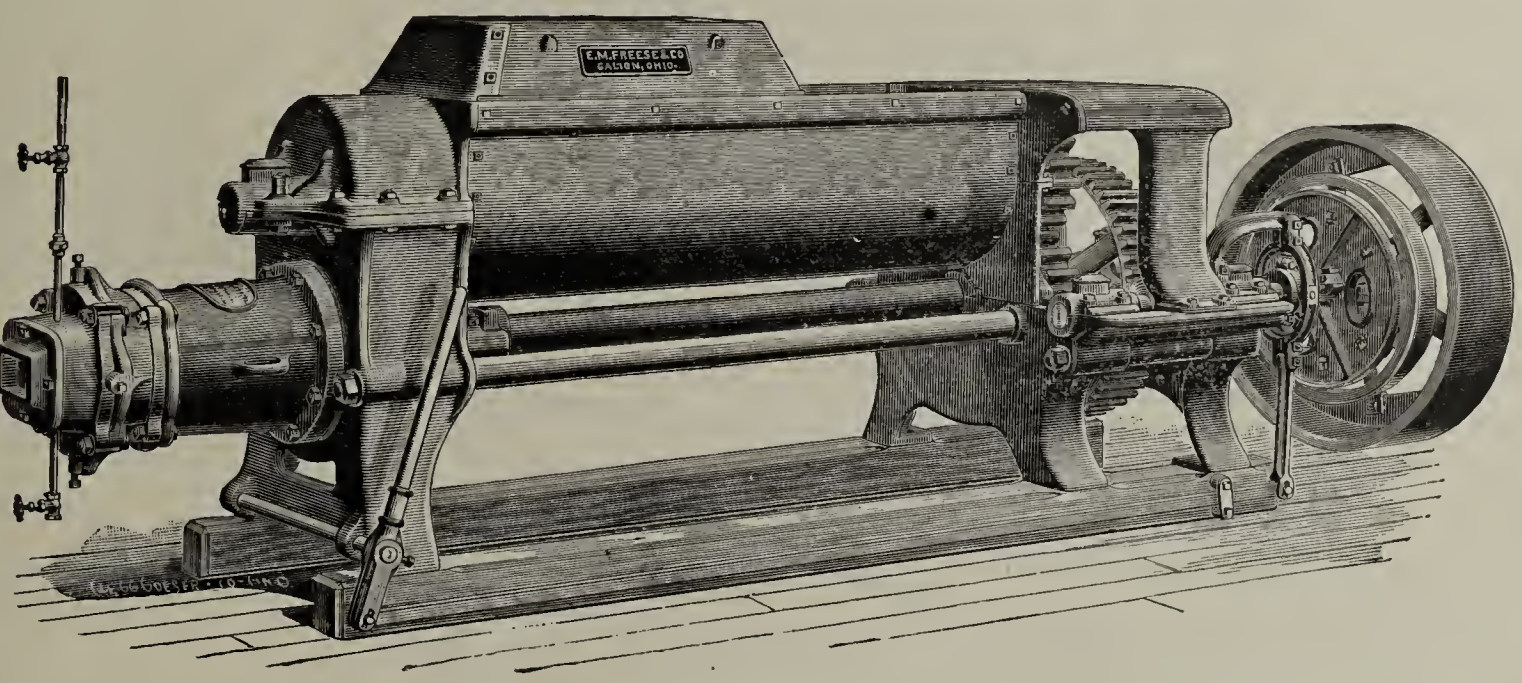
Galion, Ohio.

The Original Union Brick Machines



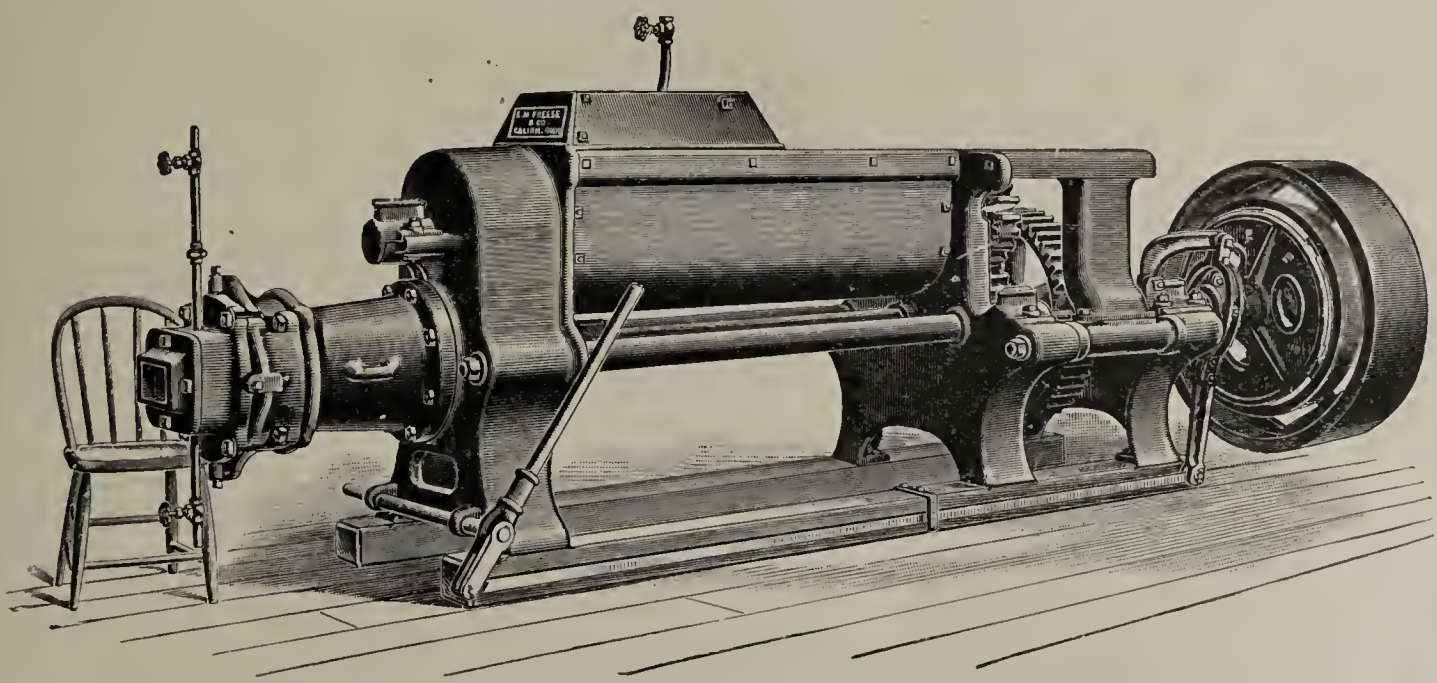
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

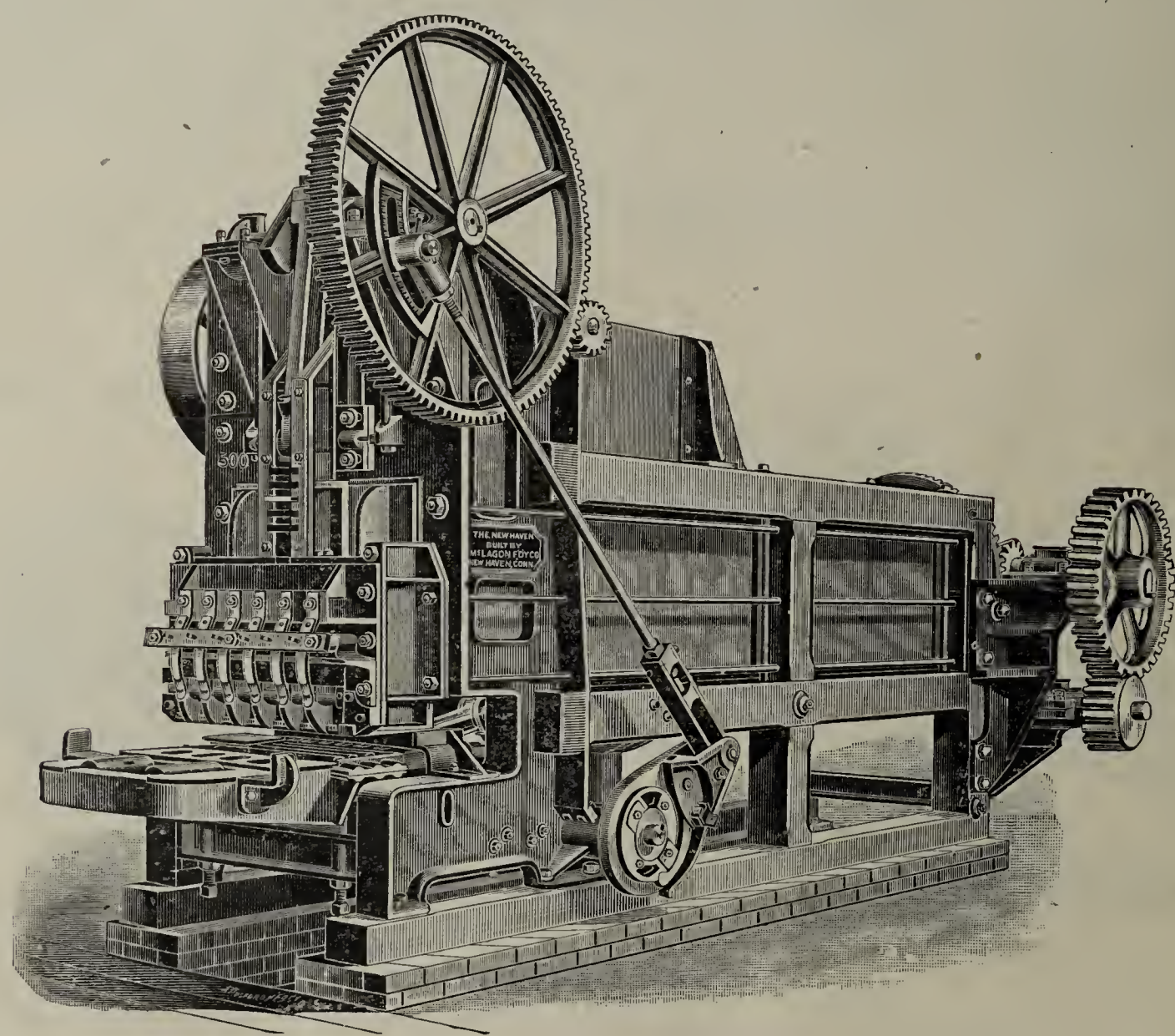
They are a SUCCESS Investigate them.

No separate Pug Mill required.

E. M. FREESE & CO., Galion, Ohio.

Only One Break in Two Years.

That Due to Carelessness.
$7.50 Paid for the Repairs.



READ THIS:

ALLENTOWN, PA., January 11, 1900.

THE EASTERN MACHINERY CO., New Haven, Conn.

Gentlemen:—Enclosed please find check for $7.50 for bill to Nov. 9, 1899.

This was **the first break we had in two years** since we used your machine, and this we think was caused by carelessness.

Respectfully, KICHLINE BRICK CO.

WOULD YOU LIKE A MACHINE OF THIS CHARACTER?

The Eastern Machinery Co.,

NEW HAVEN, CONN.

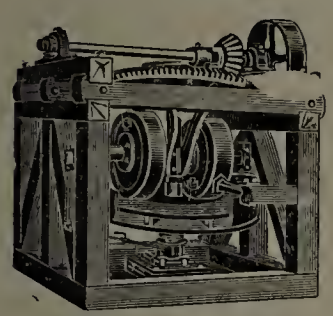
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

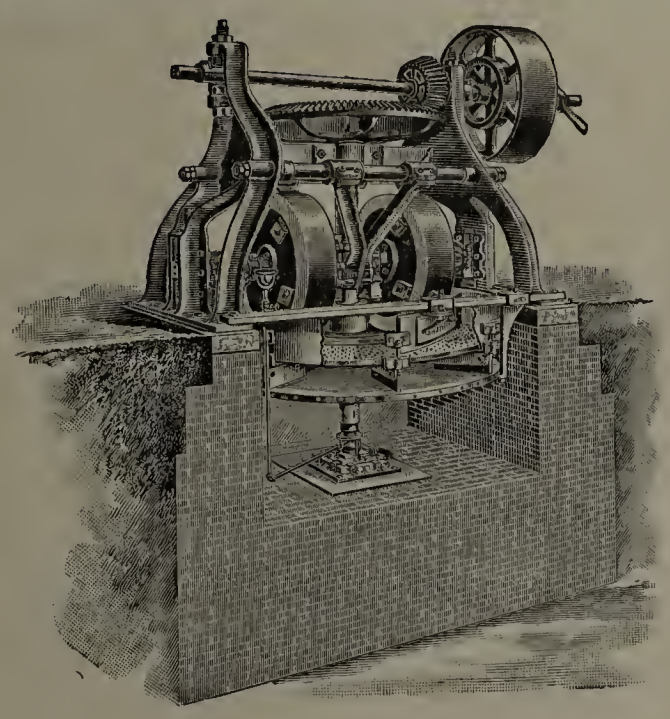
MANUFACTURERS OF

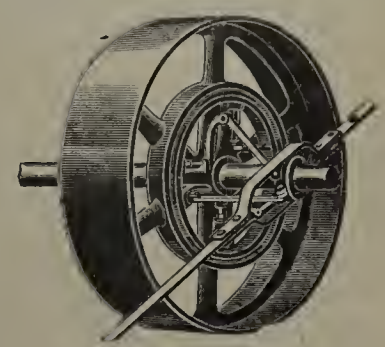
Brick Machinery.

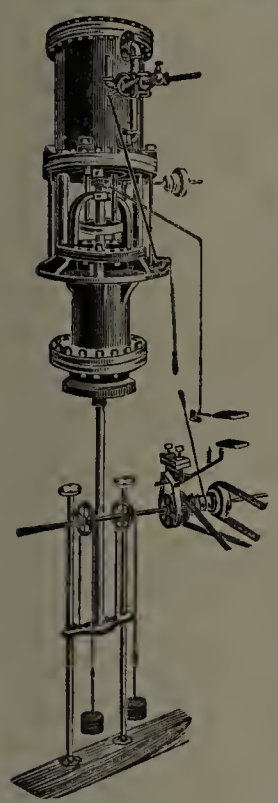
COMPLETE EQUIPMENTS.

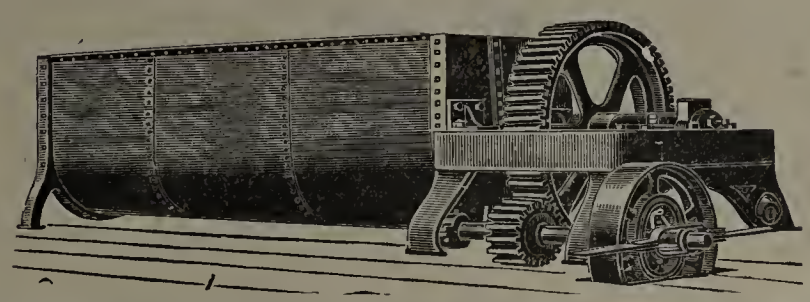
Tile Machinery

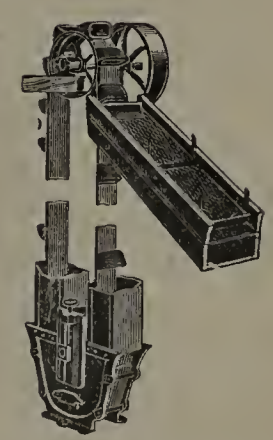












Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

The "A.B.C." Brick Dryer Never Fails

Is furnished with a rigid guarantee, which it never fails to fulfill. Descriptive Catalogue on request.

American Blower Company,
Detroit, Michigan.
New York. Chicago. London.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS, OHIO, U. S. A.

MANUFACTURERS OF ALL KINDS OF

Clayworking Machinery.

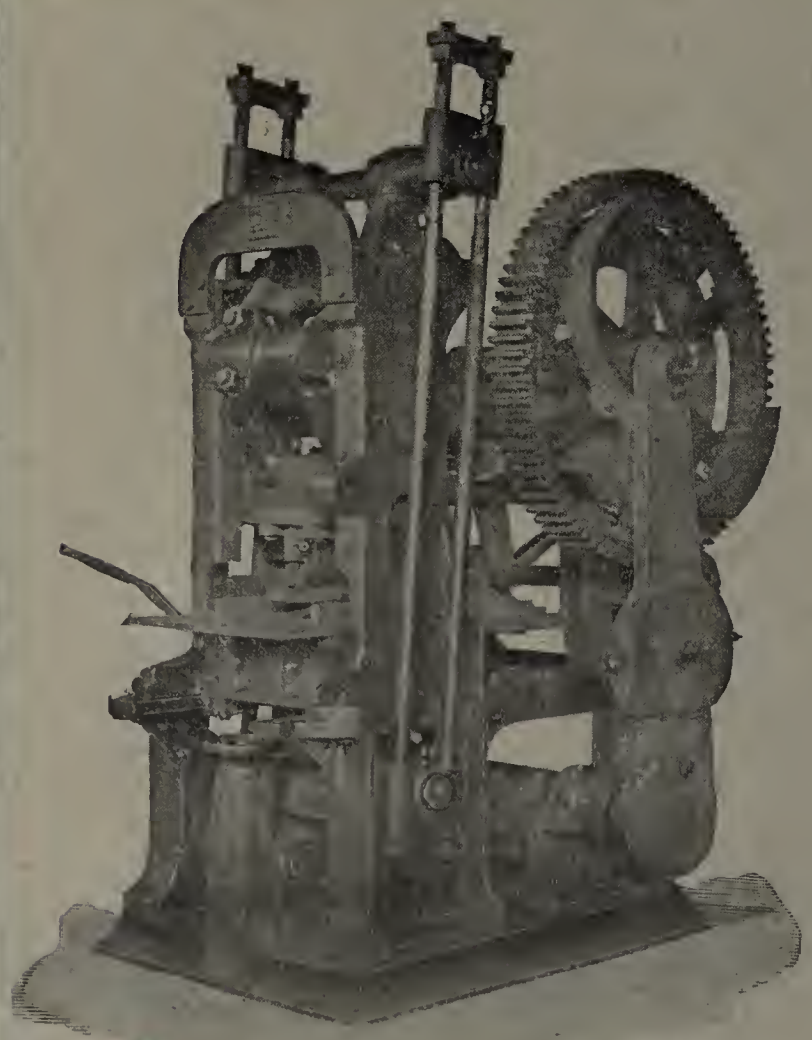
The accompanying cut shows our improved machine for making

Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



...able Mold Steam Dry Press, Made by the Ohio Ceramic Engineering Co.

When You Stop to Think

Isn't a New Dry Press just What You Need in Your Business?

Write for Catalogue.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

Table of Contents, Page 374.

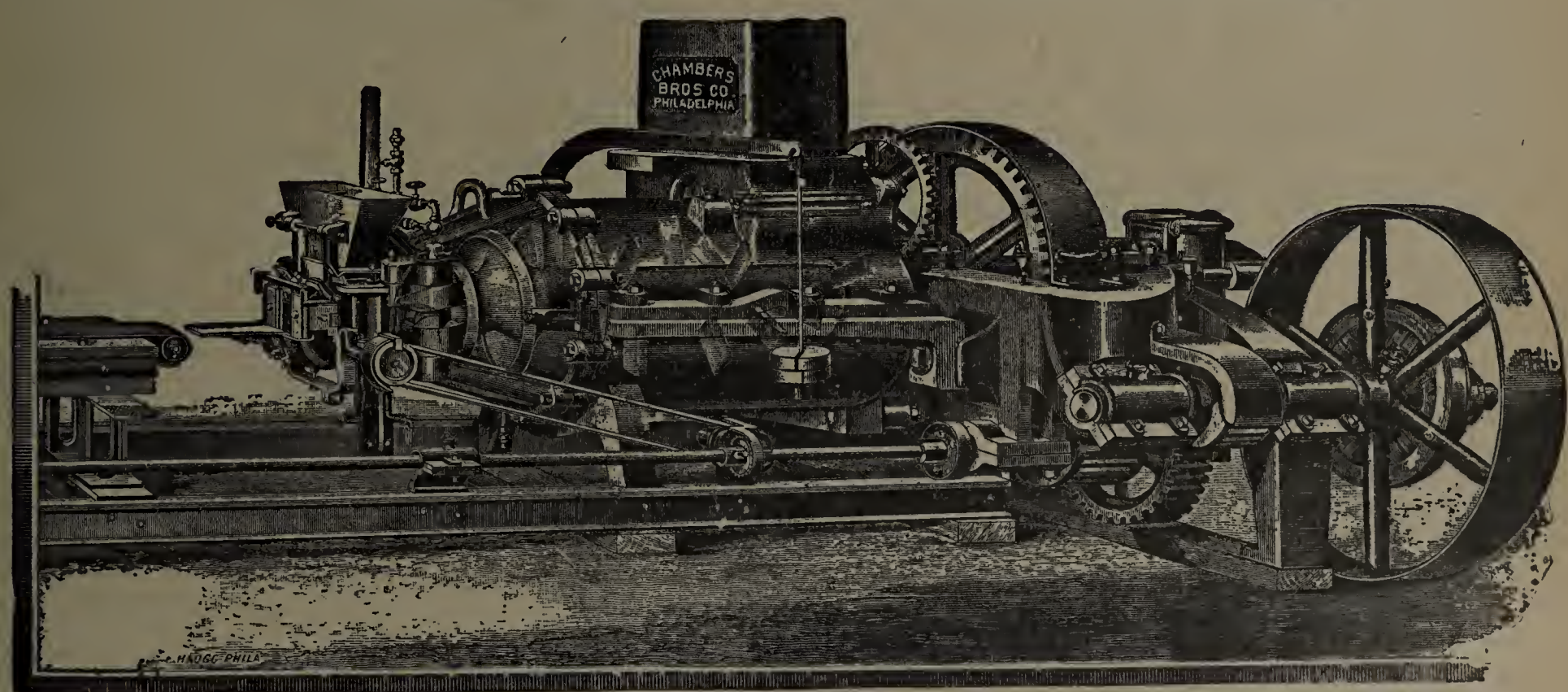
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII, No. 4. INDIANAPOLIS, IND., APRIL, 1900. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

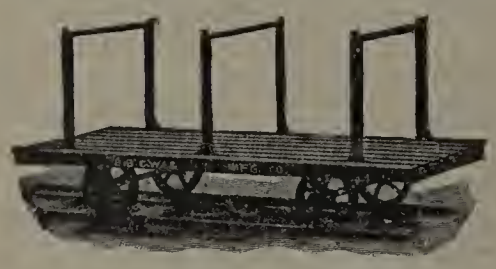
PHILADELPHIA, PA.

The Atlas Bolt & Screw Co., Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

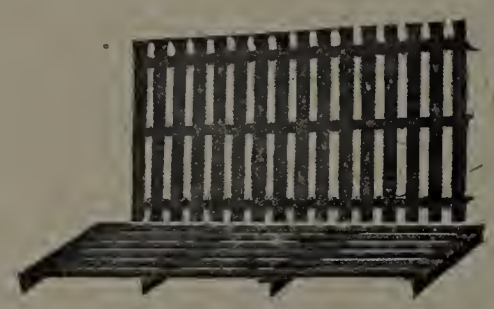
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

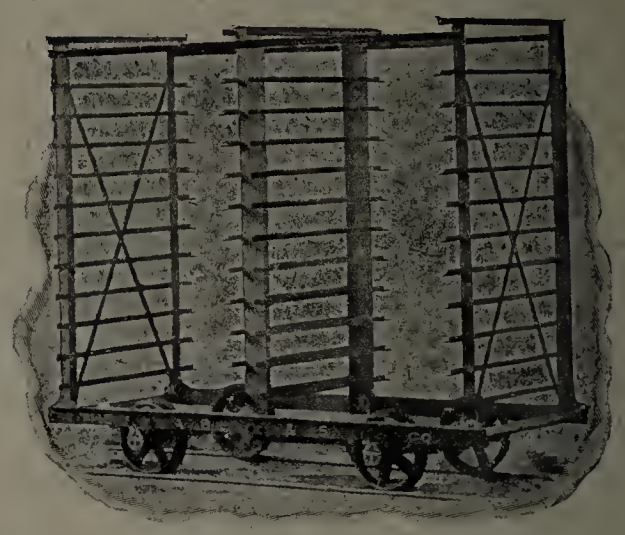
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name. Page.
American Clay-Working Mach Co, The..... 401, 409
Anderson Foundry and Mach. Works.....330, 398
Chisholm, Boyd & White Co,.328, 329
Chicago Brick Machinery Co... 332
Fernholtz Brick Machinery Co. The 333
Progress Press Brick and Machine Co..... 383
Ross-Keller Brick Machine Co 331

Brick and Tile Machinery.

Adrain Brick & Tile Machie Co. 397
American Clay-Working Mach Co., The 401, 409
Anderson Foundry and Mach. Works 330, 398
Baird and Son, H. C..... 389
Brewer. H. & Co..... 411
Chambers Brothers Co..... 325
Chicago Brick Machinery Co... 332
Eastern Machinery Co, The.... 414
Fate & Co., The J. D..... 408
Freese, E. M. & Co.....412, 413
Henry Martin Brick Mach. Mfg Co, The 404
Hensley, J. W..... 327
Horton Mfg Co, The 405
Kells & Sons 389
Leader Mfg. Co, The..... 399
Madden & Co..... 387
Mock & Co., Jas. F..... 313
Ohio Ceramic Engineering Co., The..... 416
Ohio Machine Co..... 385
Potts & Co., C. & A..... 406, 407
Prangley, James 398
Raymond Co., The C. W.... 375, 377
Stedman Foundry and Machine Works..... 381
Steele, J. C., & Son..... 396
Stevenson & Co..... 415
Taplin, Rice & Co..... 332
Wallace Mfg. Co, The..... 410
Wellington Machine Co, The... 379
Wiles Co., A. M. & W. H 396

Brick Kilns and Dryers.

Alsip, S. H 386
American Blower Co, The..... 416
Bushong, M. M 395
Carson, J. W..... 390
Eudaly, W. A 395
Illinois Supply and Construction Co, The..... 402
Morrison & Co., R. B 394
Phillips, S. G..... 384
Pike, E. M..... 388
Reppell, L. H 394
Swift, F. E 394
Standard Dry Kiln Co, The..... 334
Yates, Alfred..... 389

Brick Yard Supplies.

Atlas Bolt & Screw Co, The..... 326
Arnold, D. J. C 397
Buhl Malleable Company..... 387
Cleveland Car Co..... 400
Caldwell & Son Co., H. W..... 386
Carmichael, T. W..... 389
Carnell, Geo..... 396
Coldewe & Co., G..... 390
Cox, Geo. S..... 390
Duplex Heating & Machine Co. 397
Elder & Dunlap..... 390
Frost Engine Co 403
Hardin & Gray..... 391
Harrington & King Perforating Co, The 327
Henry Martin Brick Machine Mfg. Co, The..... 404
Horton Mfg. Co, The..... 405
Jeffrey Manufacturing Co, The. 391
Kendall & Flick..... ..
Marion Steam Shovel Co..... 399
Murray Iron Works Co., The.. 383
Main Belting Co 385
Mershon & Co., W. B 388
Newton, A. H..... 391
Newton A. C..... 391
Phillips & McLaren 388
Rockwood Mfg. Co, The..... 387
Turner, Vaughn & Taylor Co... 416
Vanduzen Co.. The E. W 389
Williams Patent Crusher and Pulverizer Co 333

Miscellaneous.

Burt Manufacturing Co..... 374
Chesapeake & Ohio R. R..... 391
Clinton Paving and Building Brick Co., The..... 393
Coaldale Brick & Tile Co., The . 392
Cotton Belt Route 390
Columbia Improvement Club. 384
Dean Bros. Steam Pump Works 389
Evens & Howard 389
Gabriel & Schall..... 388
Green & Hunter Brick Co 392
Harper-Norton Shale Brick Co The..... 392
Indianapolis Engraving and Electro Co..... ..... 388, 391
Indiana, Decatur & Western ... 390
Indiana Paving-Brick & Block Co..... 392
Lake Erie & Western..... 390
Miller Oil and Supply Co 388
McAvoy Vitrified Brick Co 393
New York Brick and Paving Co 392
Osborne, W. R..... 389
Preston Brick Co..... 393
Pennsylvania Line 391
Pittsburg Tubular Steel Whiffletree Co..... 384
Purington Paving Brick Co, The 393
Terre Haute Brick and Pipe Co. 393
Vandalia Line..... 391
Wabash Clay Co., The..... 393
Ads., Small Wanted, For Sale, etc.

Mention the Clay-Worker
WHEN WRITING TO ADVERTISERS
Mention the Clay-Worker

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

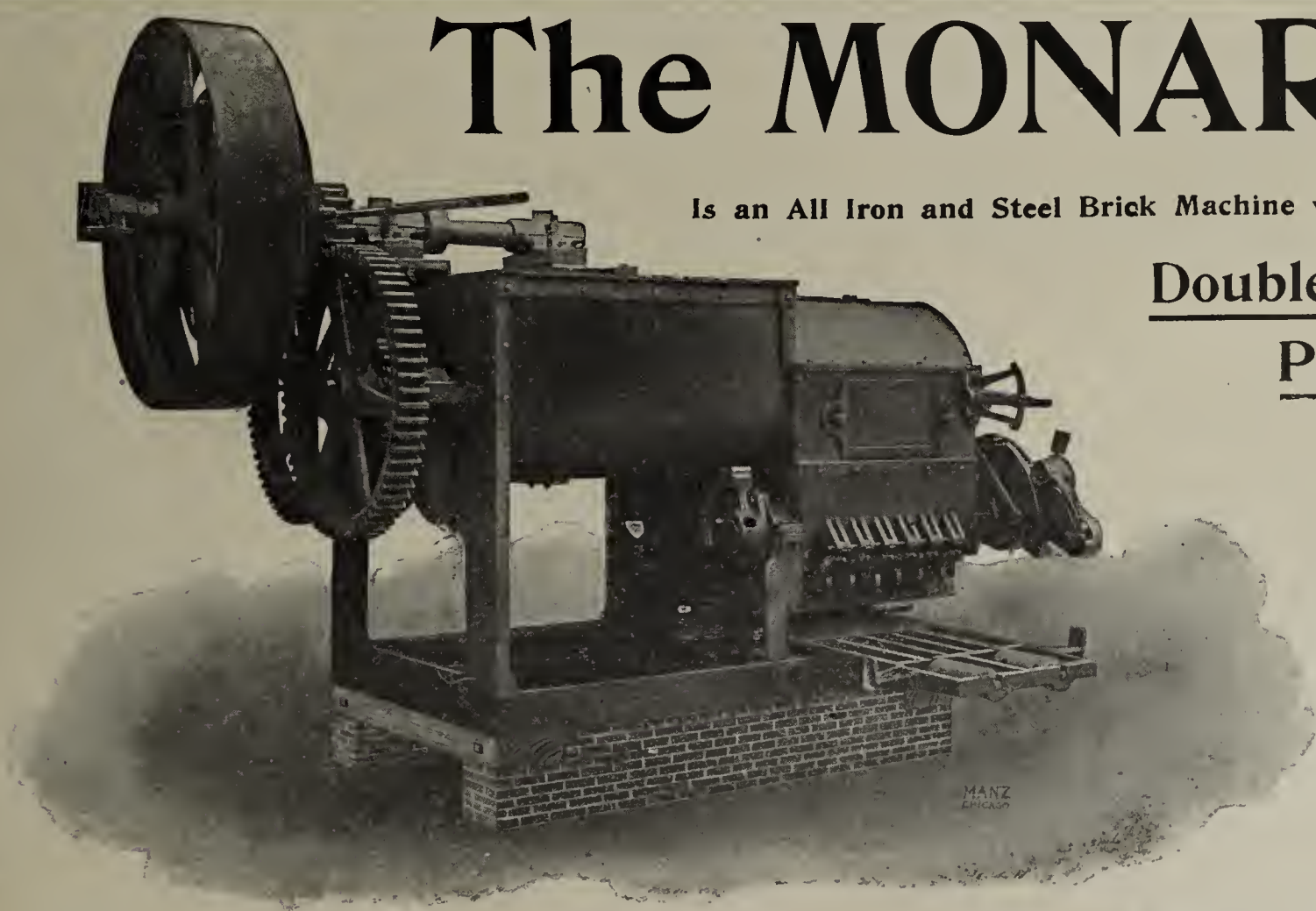
Samples or blue prints with prices furnished on request.

THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.



SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

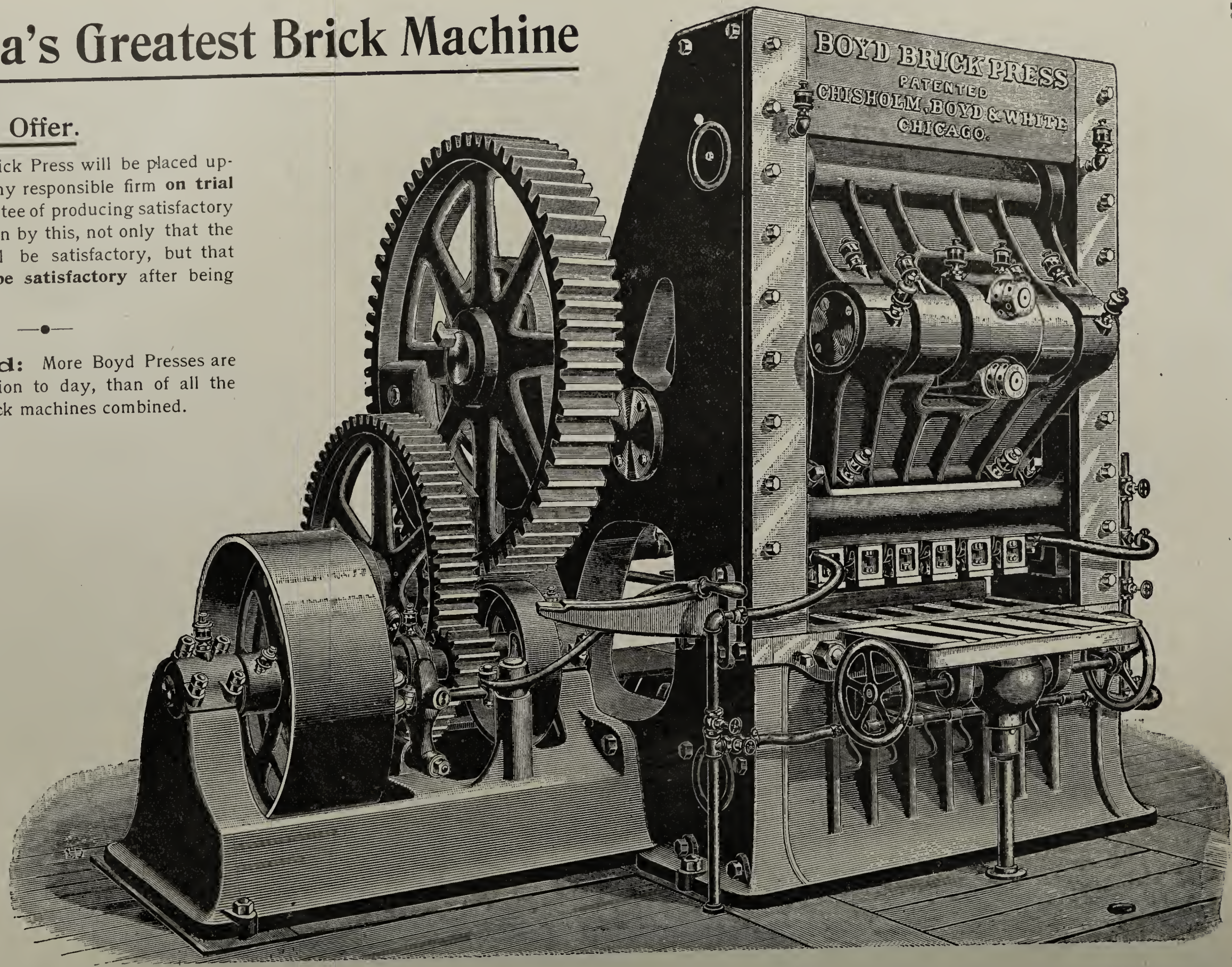
W. L. KIDNEY, Sales Agent, Capetown, South Africa.

America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets.

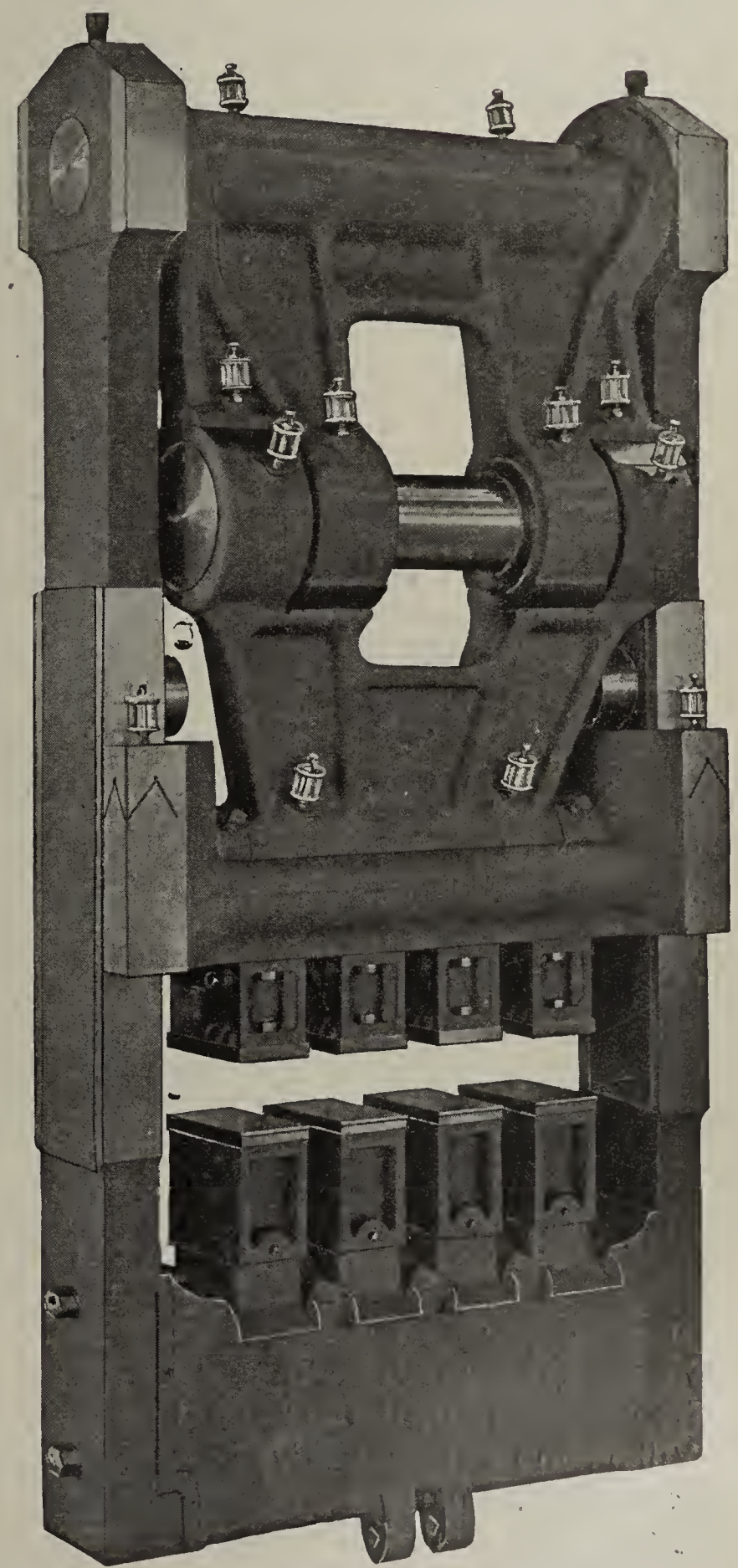
CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Powerful Pressing Mechanism of the Boyd Press Lasts Forever.

Great for Strength.

The engraving shows the heavy forged steel Side-Bars, the Toggles, the upper and lower Crossheads, with the plungers in position. These comprise the "pressing mechanism" of the Boyd Brick Press, and take all the strain exerted in pressing the bricks in the molds between the plungers. They can never wear out and cannot be broken. These pressing parts are suspended upon the lifting levers, and the side frames of the press only guide the side-bars in their upward and downward movements.



Great for Beauty.

The symmetrical design of the Boyd Brick Press gives it the strength and beauty for which it has always been distinguished. The housing or stand, which contains the driving pulley and intermediate gears, is bolted to the main frame as shown. Each press rests on the floor line, is self-contained and does not need to be bolted or fastened to its foundation.

Noiseless.

No strain is exerted upon the side frames of the press. The movement of the Boyd Press is noiseless and without jar or shock. No buffers, air cushions, hooks, latches, or other uncertain mechanism are required or employed. There is nothing to get out of order. The mold liners are the same for and will fit each size press. They can be taken out and replaced, or ornomental molds set in without removing any of the working parts of the press.

No Pitman-Lever.

The Modern Boyd Press has no **Pitman-Lever,** though we have the only valid Patents on Pitman-Lever Presses. Eight and ten years ago we built Pitman-Lever Presses, but none since 1891, when it was superseded by the Improved Boyd. Nobody now wants a Pitman-Lever Brick Press, can't afford to use one. We will tell you why if you want to know. So could some of our first customers.

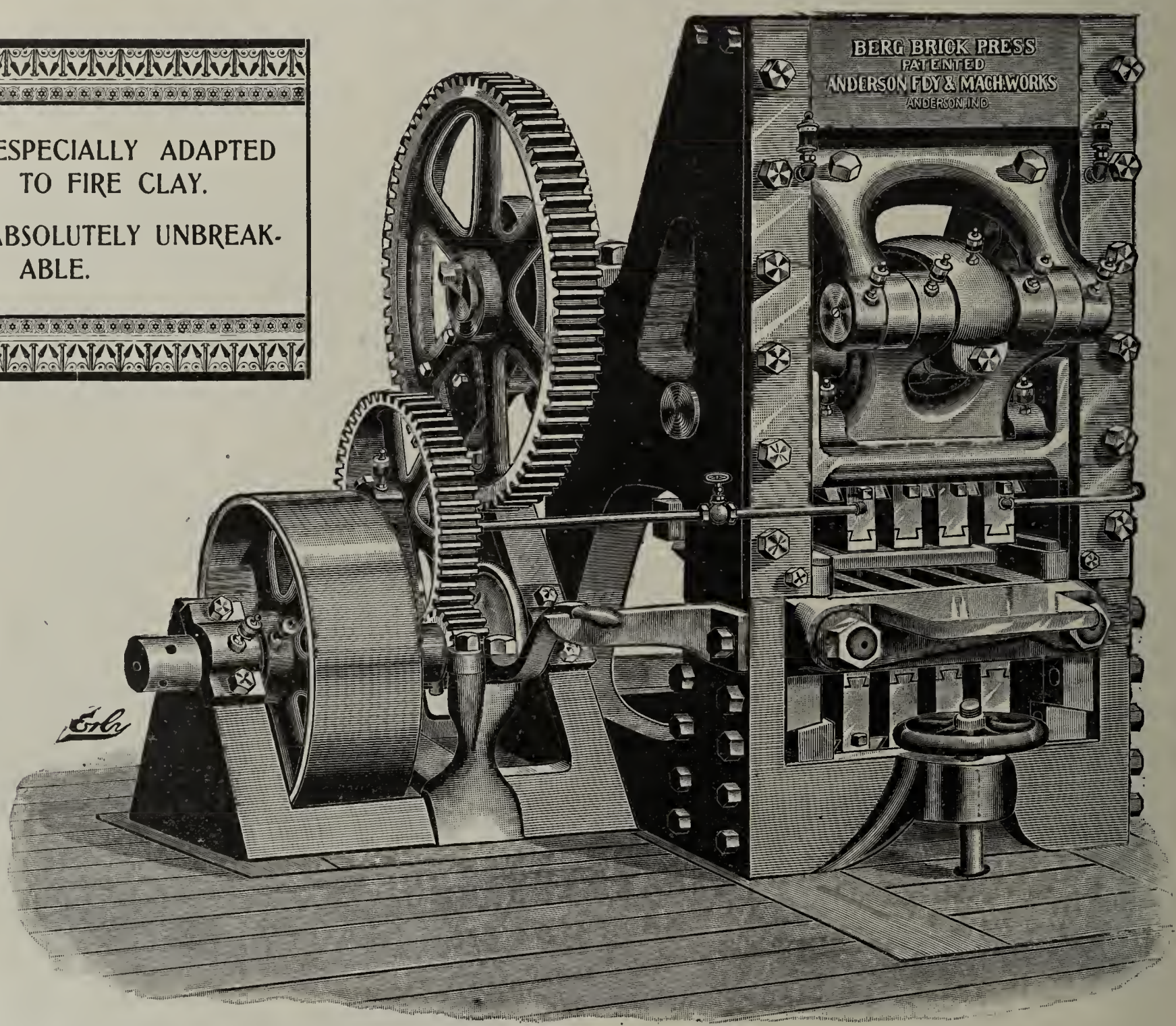
CHISHOLM, BOYD & WHITE COMPANY,

OFFICE AND WORKS: 57th and Wallace Streets. CHICAGO, U. S. A.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

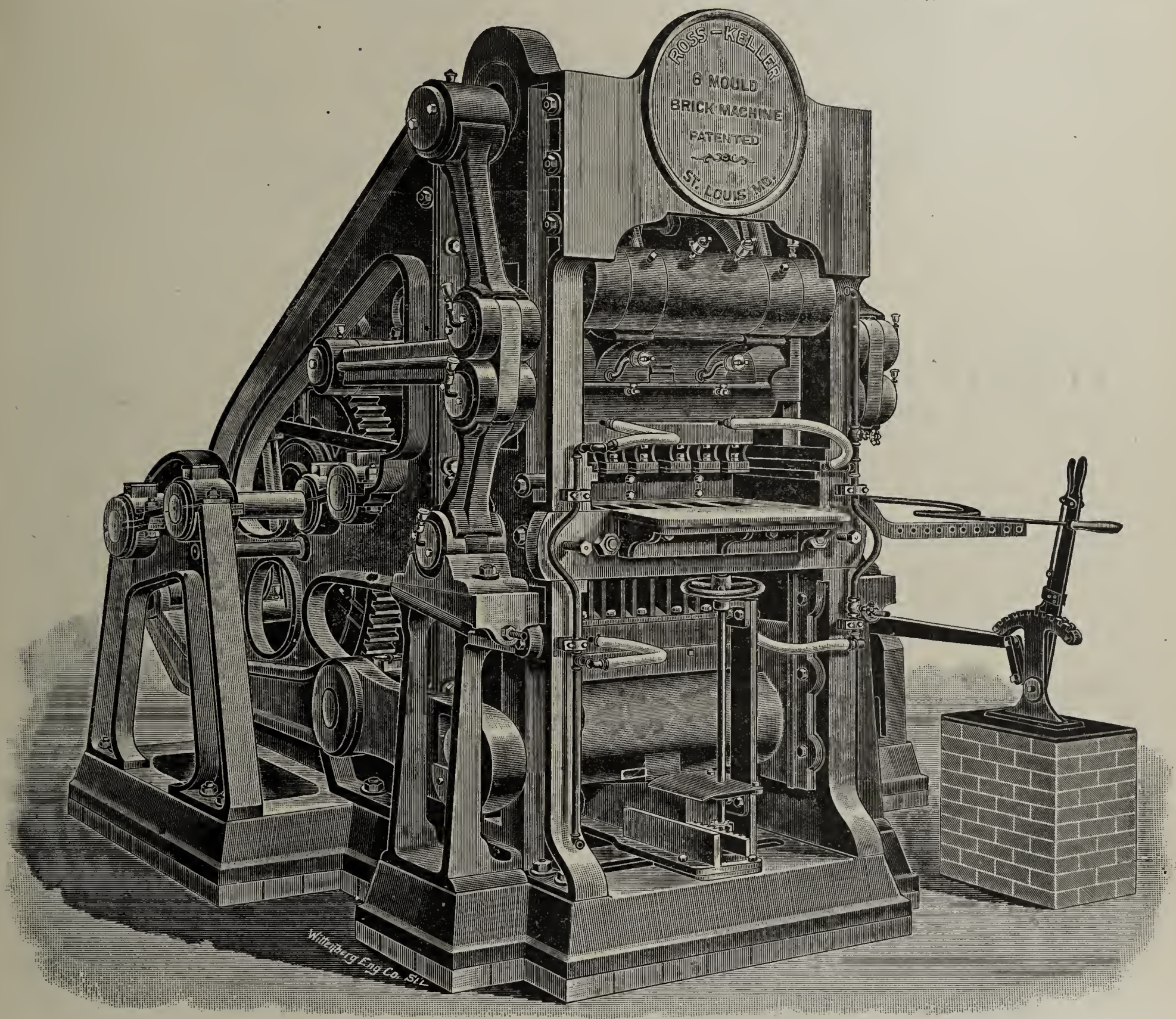
MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

The Latest Improved Ross-Keller TRIPLE PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 35,000 to 40,000 brick per day.

BRICK SET IN KILN DIRECT FROM MACHINE.



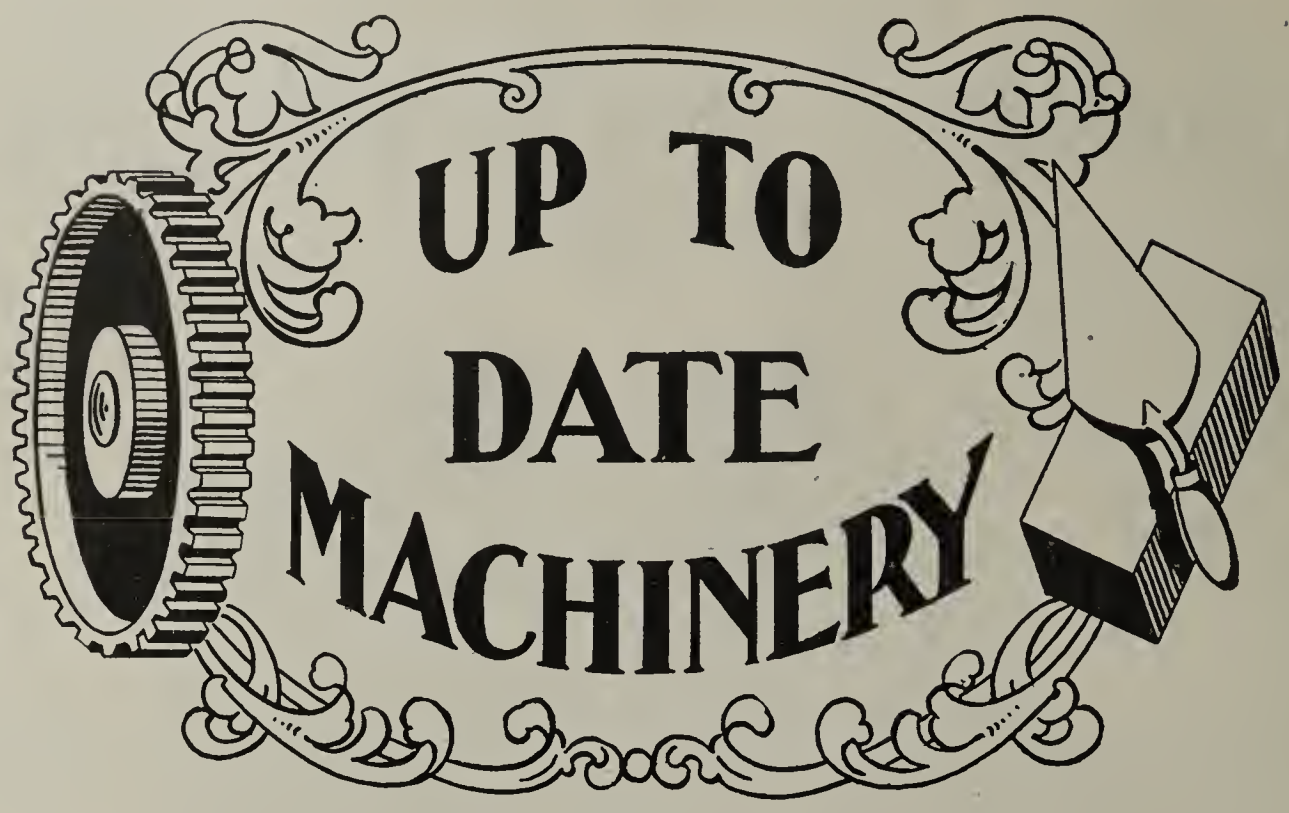
"The Proof of the Pudding is in the Eating."

THE ROSS-KELLER BRICK MACHINE is not "pronounced by the United States Government the highest development of the **Art**" of brick making machinery. But the United States Government **DID** on the 24th day of October, 1898, "pronounce" to the world that the ROSS-KELLER MACHINE was the best "development" to be used by it for the manufacture of forty million pressed brick to be used in the construction of the new United States Penitentiary at Ft. Leavenworth, Kan., as was evidenced on that day, when bids from all of the makers of pressed brick machinery were opened, and after a thorough examination of the different machines in practical operation, **DID** purchase at the highest bona fide bid, the ROSS-KELLER MACHINE. For particulars regarding the working of this machine during the first year, we respectfully refer to the Hon. R. W. McClaughry, Warden U. S. Penitentiary, Ft. Leavenworth, Kansas.

Two of our six mold machines are used by the Green & Hunter Brick Co., Thurber, Texas, the finest plant in the United States—If our machine is good enough for Uncle Sam and such plants as the Green & Hunter Co., why is it not good enough for you? **For Price and Full Particulars Address**

Ross-Keller Brick Machine Company,

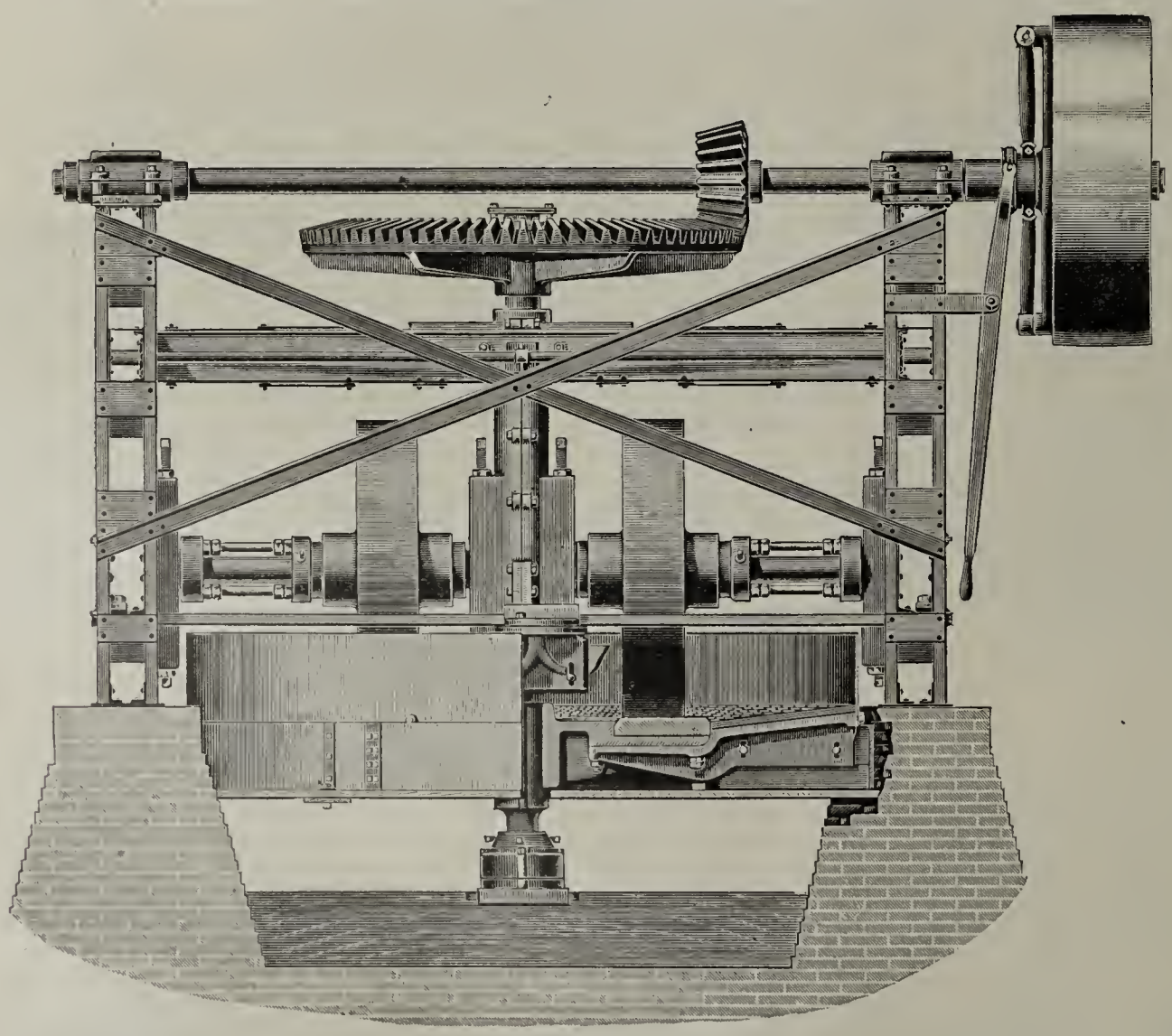
915 and 916 Holland Building, ST. LOUIS, MO., U. S. A.



When Buying New Machinery

Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front an Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.



MODERN DRY AND WET PANS,

Lightest Running
Greatest Strength
Most Convenient for Repair.

18

MACHINES OF THIS TYPE SOLD IN 3 MONTHS.

Complete or Part Outfit for

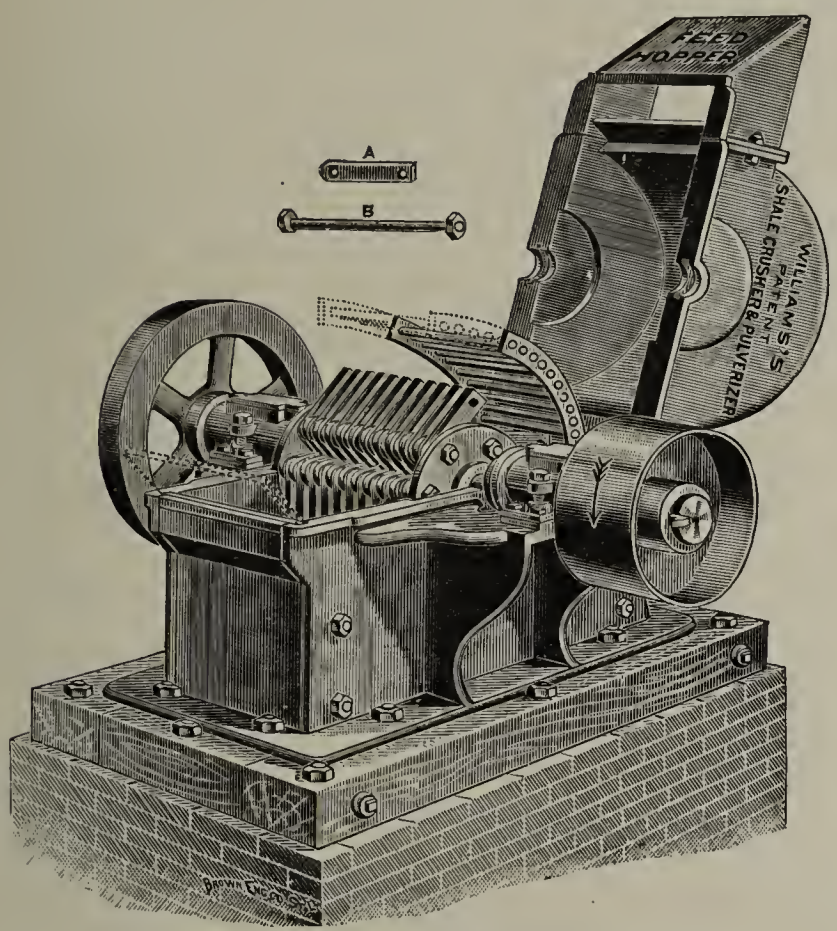
Sewer Pipe,
Fire Proofing and
Pottery Machinery.

Write us for Catalog and Prices.

TAPLIN, RICE & CO., Akron, Ohio, U. S. A.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

FOR FURTHER INFORMATION WRITE TO

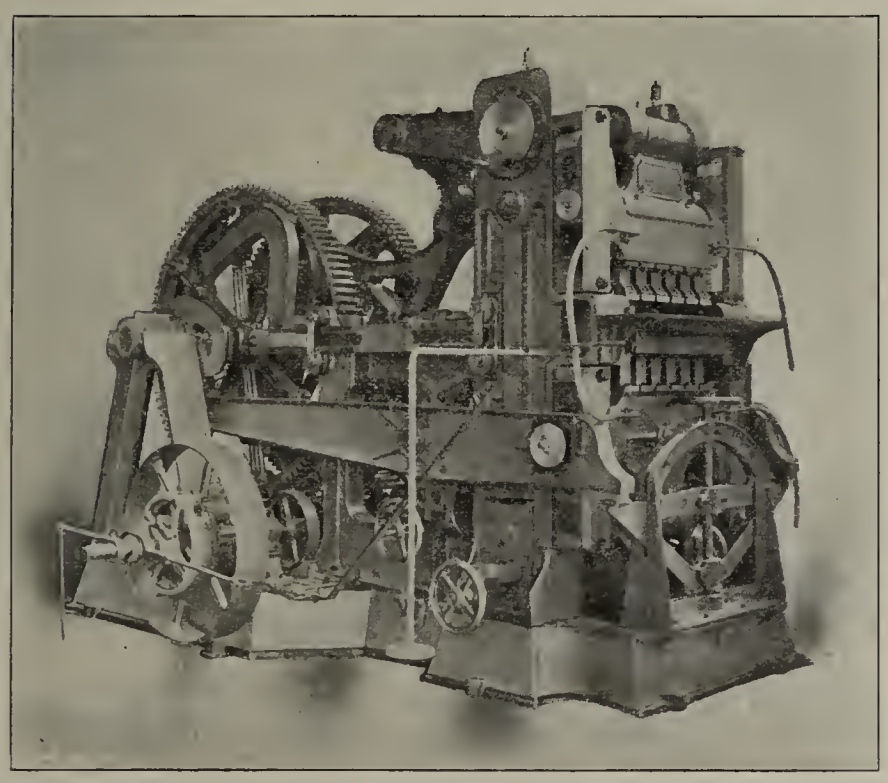
The Williams Patent Crusher and Pulverizer Company,

2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Singer Building.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, SIMPLICITY and SERVICE.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market.

All parts subject to strain are made of the best Bessemer steel.

Fitted with the Fernholtz Mold Box. Undoubtedly the leader.

We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer**, and the **Fernholtz Clay Mixer**, in our own factory.

Dealers in Brickyard Supplies.

PARIS, TEXAS, March 13, 1900.
THE FERNHOLTZ BRICK MACHINERY CO., St. Louis, Mo.
Gentlemen:—We are in receipt of your inquiry in regard to our Brick Machine, and in reply beg to say that we have been operating machine regularly for five years, and the repairs on same have been about $50.
We consider this a very good record and will take pleasure in recommending it to anyone who is interested in Brick Machinery.
Very truly yours, CARTER & ROLLINS.
Per Carter.

Further Information on Application.

The Fernholtz Brick Machinery Co.,

CABLE ADDRESS "FERNBRICK." WESTERN UNION CODE.

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

Mexico Agent: INTERNATIONAL SUPPLY COMPANY, City of Mexico, Mexico.

The STANDARD BRICK DRIER,

May not be the ONLY good Drier on the market, but it is considerably better than the average good Drier.

For economy of Fuel and Labor, Range of Work and Capacity it is without a successful rival. It is easily regulated to meet the requirements of all kinds of clays, it is entirely free from complicated mechanical contrivances and requires no expert labor to operate it. It is SIMPLE, SAFE and SENSIBLE and it is NOT an experiment. It is SO good a Drier that you cannot afford to ignore it when it comes to the point of investing your money in a Drier.

OUR NEW CATALOG No. 50 Which we will be pleased to exchange for your Name and Address is full of information that will interest you. It tells concisely and plainly how THE STANDARD DRIER is constructed. how it operates, what it will dry, why it is economical and efficient, why it is the Drier that will most thoroughly satisfy you for all time and what its many users think of it. Write for a copy TO-DAY.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., APRIL, 1900. No. 4

Written for THE CLAY-WORKER.

BRICK PAVEMENTS IN GREATER NEW YORK.

Methods of Construction—Relative Merits of Different Fillers.

BY GEORGE W. TILLSON, C. E.

PEOPLE WHO DO NOT RIDE WHEELS have made many complaints during the past few years against bicyclists, thinking that they asked a great deal for themselves and considered that they were aggrieved if they did not get it. Be this as it may, it cannot be questioned that the great interest taken lately in good roads and smooth pavements has been brought about, in a great degree, by the efforts of the wheelmen. It has resulted in a direct benefit to those who drive, as well as those who ride wheels.

In 1895, when it was determined by Mr. Alfred T. White, then Commissioner of Public Works, in Brooklyn, to lay a smooth pavement on the different streets, necessary to connect the asphalt pavements of the Heights section with those on the Park slope, it was decided to lay vitrified brick on Nevins street, between Schermerhorn and Dean Sts. This connection enabled bicyclists coming from New Nork over the Brooklyn bridge to ride to Prospect Park and Coney Island on smooth roads the entire distance. Previous to this time no brick pavements had been laid in Brooklyn. The distance from Ohio and the other paving brick centers is so great that the heavy freight rates made it difficult for brick to compete with other paving materials, so that it had been at a disadvantage.

Nevins Street, Brooklyn, N. Y., Paved with Canton Block in 1895.

Fortunately for the city, and brick pavements in general, the contractor on the work procured the Metropolitan block, of Canton, O., an analysis of which was contained in my last paper. Owing to the great demand for brick, it was not possible to obtain material enough to complete the entire contract in 1895, but one block was opened for travel. Nevins street is but 22 feet between curbs, and besides being a part of a connection of good pavements from one section of the city to another is a direct line of communication from the coal yards and docks around Gowanus canal, at which a vast amount of building material is delivered annually. So that the traffic it sustains is almost continuous and of just the character to most injure a brick pavement, that is, moderately heavy, driven at a moderately fast pace. The author does not believe that heavily loaded trucks moving over a brick pavement at, say three miles an hour, does it as much harm as a lighter load moving at double the speed.

The question of proper filler for the joints was carefully considered by the Engineer. Mr. N. P. Lewis, who is a firm believer in brick as a paving material. It was known that a very large proportion of the brick pavements of the West had been laid with sand joints, and that brick as a paving material had gained its reputation from these very pavements. But where a street has to sustain so heavy a traffic as Nevins street, it was decided to adopt a filler made of equal parts of the best Portland cement and a very fine, clean, sharp sand. The base was made of concrete mixed in the proportions of 1 cement, 2 sand and four of broken stone.

The foundation of any block pavement is very important.

Granite is generally taken as the standard to which to refer all other material when it comes to the question of durability. Yet one has only to look at a trench opened in a granite pavement where the blocks have been loosely relaid, awaiting the settlement of the trench, and allowed to remain a few weeks, to see how much abnormal wear the blocks have sustained, owing to their having been allowed to get out of position so that the traffc struck them on the corners, at angles entirely different from what it did in pavement, and the wear is proportionately greater. So in any block pavement, whether of stone, brick or asphalt, the foundation should be substantial enough to preserve the blocks in position so that the traffic will be received vertically upon the face of the block, thus making a smoother surface and also reducing to a minimum the wear on the blocks. Bricks being generally smaller than other blocks present more corners, and are consequently injured proportionately more by any disarrangement.

While there is no question in the minds of the engineers as

View 2, McDonough Street, Brooklyn, N. Y., Laid in 1895.

to the best foundation for brick, the proper filler for joints has not been so unanimously determined upon. At the recent meeting of the American Society of Municipal Improvements, held in Toronto, quite a discussion was held on the point. The present President of the society made the general statement that he considered a Portland cement filler to be a complete failure. Two other engineers agreed on the conclusion that a cement filler would increase the life of a brick pavement under ordinary conditions at least five years beyond a sand filler. When it is known what good service the sand joints pavements of the West have given, and are still giving, it will be understood how far apart these two opinions are and how unsettled is this question.

There are good arguments against cement joints. One is the rumbling noise that often accompanies a brick pavement laid in this manner (this will be considered later); another is that there is no elasticity in it. That it makes an absolutely rigid pavement, and, when once broken, is gone forever, and is even worse than one of sand. Still another is the difficulty of making openings for water or sewer connections, and repairing them. Many of the bricks are broken and destroyed in cutting through the pavement, and considerable labor is required to clean the bricks so they are fit to be relaid. It is also difficult after cementing the joints in a patch to keep travel off from it and allow the cement to set.

A trench was opened in Nevins this season and the brick relaid with cement joints similar to the original pavement. The traffic got on to it too quickly, broke the set, and the bricks were all taken up and laid with a pitch joint which required no appreciable time for hardening. While the trench was open measurements were taken of the brick on the edge in the center of the roadway where travel was the greatest, but on the whole no appreciable wear could be discovered after four years of hard service. Of course an occasional soft brick was used on the street and they are plainly seen at the present time, but as a whole the street will compare favorably with any similar street in the city, and is still good for many years more, despite the heavy traffic. The illustration on preceding page shows it as it was in November, 1899, after having been laid four years.

The position of blocks in any block pavement has always been a subject of discussion, especially at intersections. The common practice at present is to lay them at right angles to the line of the street between streets, and at intersections to lay them diagonally or on the so-called herring bone plan. The principle is to present as little length of joint to the action of travel as possible. This has been accomplished between intersections, as heretofore stated, but a few cities and engineers advocate laying the blocks diagonally the entire length of the street. The writer could never see the necessity or benefit of this plan. It makes a bad place at the gutter, with stone requiring considerable cutting to fit the blocks, and also with brick, unless special forms are used made to conform to the angle of the corners. The city of Indianapolis, in its specifications for wood pavements, requires the blocks to be laid at an angle of 45 degrees to the roadway, but the writer knows of no other city where this is done.

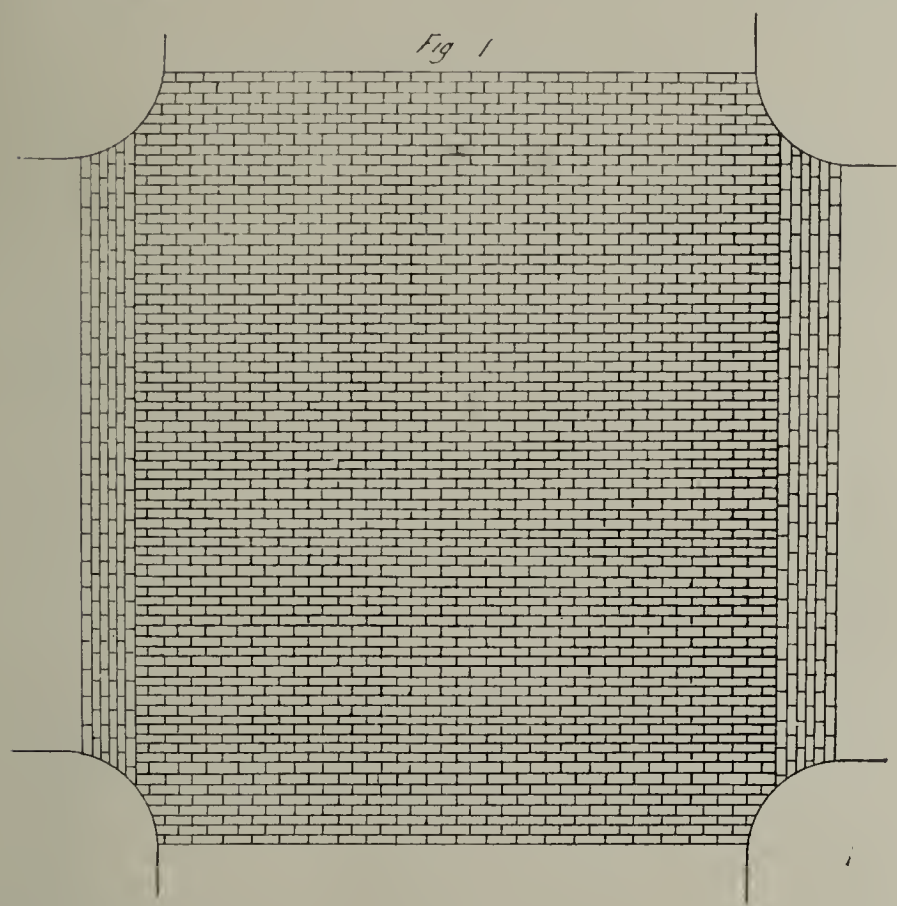
With the intersections it is an entirely different matter. The travel comes in several directions and the problem is to arrange the blocks in such a way that the short joints will be opposed to traffic as much as possible. When oblong granite

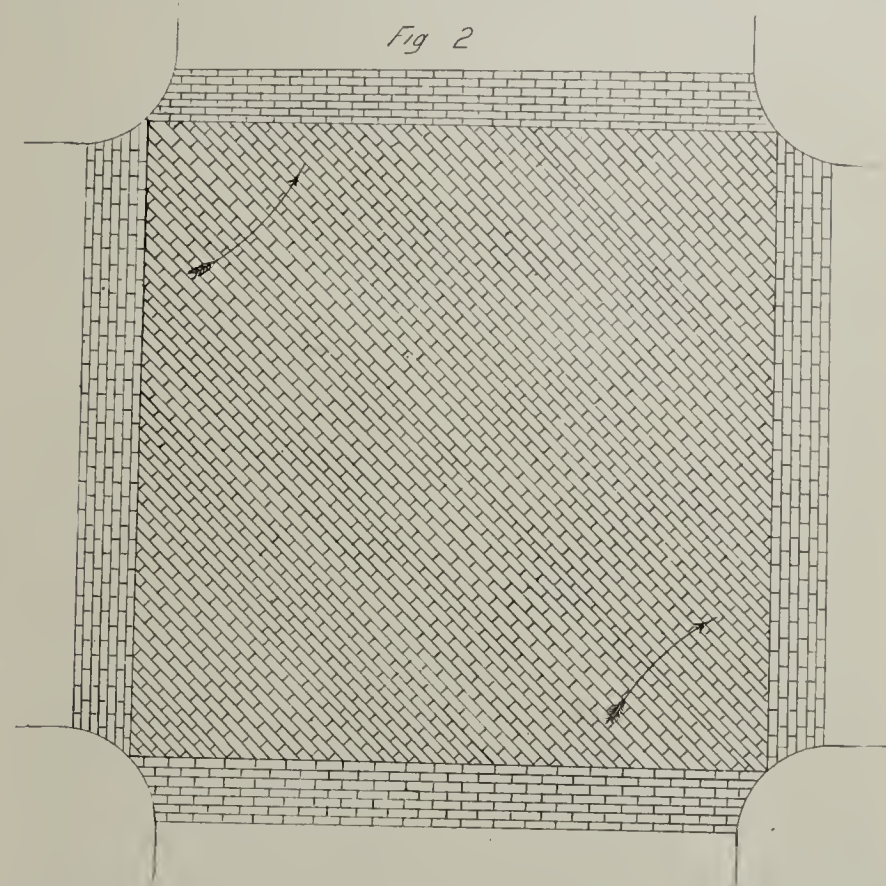
View 3, Nostrand Ave., Brooklyn, N. Y., Laid in 1897.

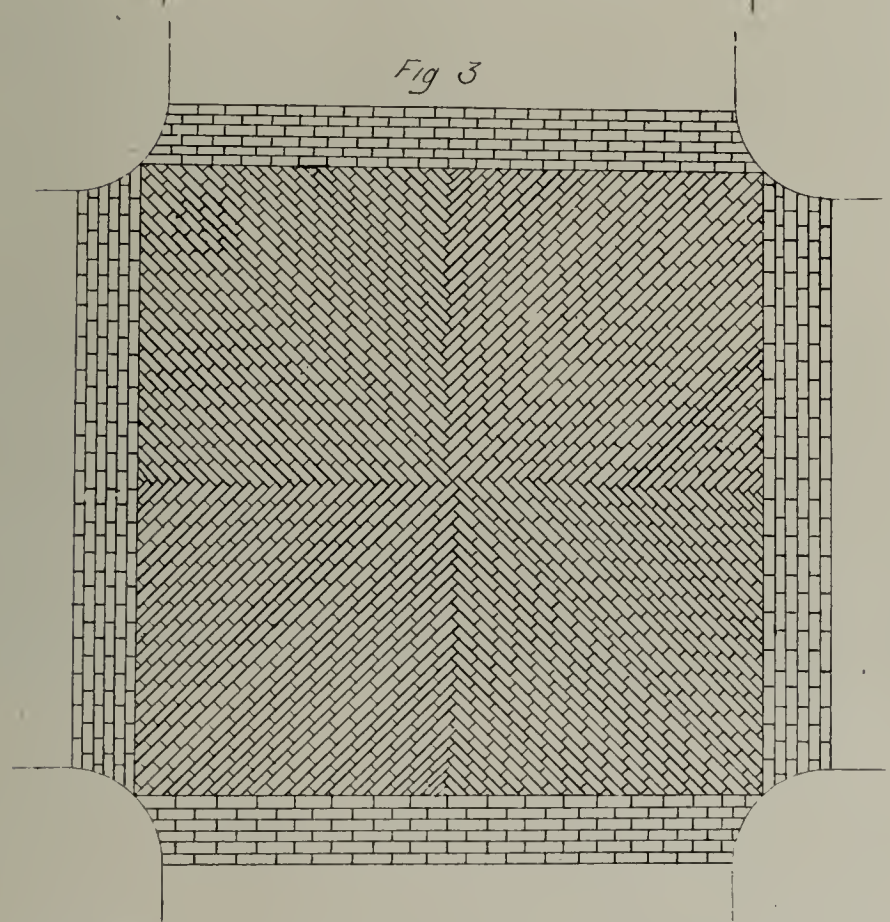
blocks were first used this was not understood and they were laid at right angles to the street that was being paved and parallel to the direction of all cross streets, as shown in Fig. 1. This resulted in the blocks first being crowded out of place, especially when laid with sand joints, and this caused an abnormal wear, the blocks being rounded off on the edges and the pavement at the intersections becoming worn out long before the remainder of the street. To prevent this, they were next laid diagonally, as shown in Fig. 2. This was all right for the travel on the street proper and that going in the direction shown by the arrows, but was all wrong for that turning the other corners. The next development is seen in Fig. 3, where the double diagonal is used, making the length of the blocks opposed to the corner travel and their diagonal opposed to that of the principal street. This is the system adopted by the Brooklyn streets, and the results have plainly shown it to be the best. Fig. 4 shows a plan sometimes used, and is

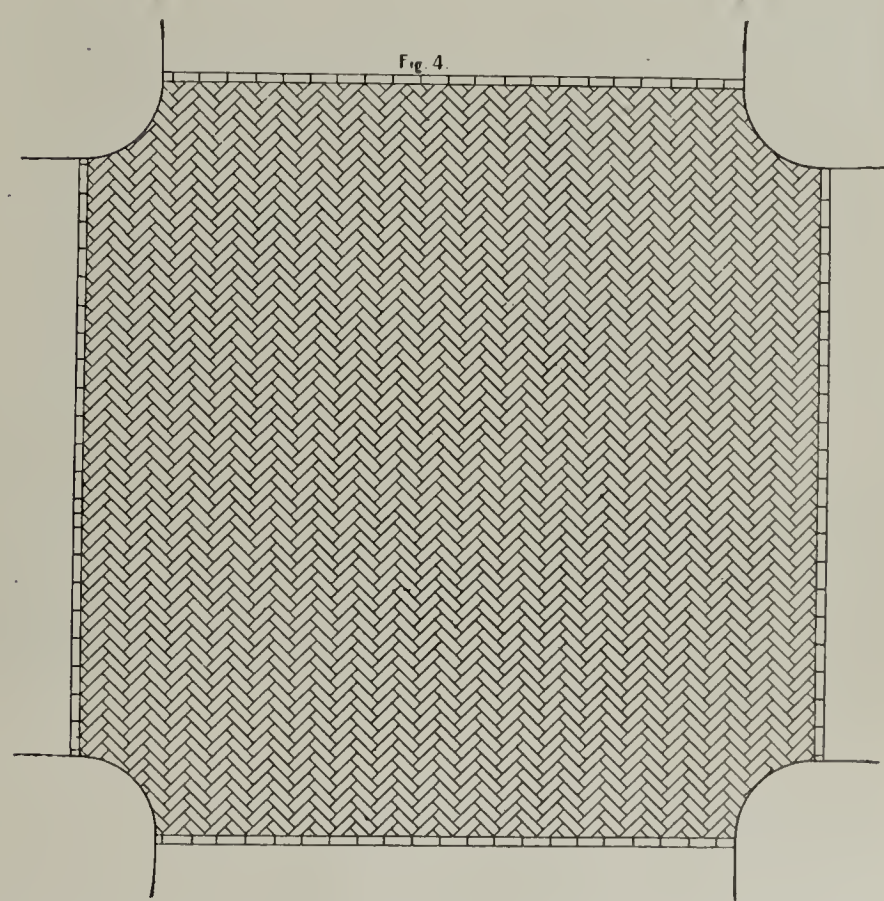
known as the "herring bone" plan. This was tried at the intersection of Nevins and Dean streets, where its inferiority to Fig. 3 is plainly seen. As the arrow shows quite a large number of the brick are lengthwise of the corner of travel, and at this particular intersection this is very great, as the wear of the brick plainly shows.

The cost of the Nevins street pavement was $2.34 per yard, including the removal of the old pavement (granite, which became the property of the city), and the 6-inch concrete foundation.









In the same year the property owners on McDonough street, in the two blocks between Marcy and Throop avenues, petitioned for a brick pavement. This was the first case of such a pavement where the property owners were to pay the one-half cost. The contract was awarded to the same contractor who secured Nevins street under the same specifications, but in this instance he saw fit to use the Mack block, made from fire clay. The cost was the same as on Nevins street. McDonough street is in one of the best residential sections of the city, where the traffic is not great, and is an ideal place for a brick pavement.

After the brick and concrete was in place, but before the former had been grouted, the weather turned cold, and it was necessary to suspend operations until it became milder. When work was resumed it was found that the sand cushion was frozen solid, and, when it was attempted to roll the brick, many of them were broken. Hot water was poured into the joints in order to thaw out the sand. This was partially effected and the grouting done, traffic being kept from the street until the cement was set. The result was a good pavement, but the following season considerable complaint was made about the rumbling.

In 1897 Nostrand avenue, between Prospect Place and Park Place, was paved with brick. This street is 34 feet wide between curbs, and has a double line of street car tracks. On this account it was deemed best to adopt the pitch joint for a filler, rather than one of cement. The track construction not being rigid, the motion of the rails under the motors must have some effect upon the adjacent brick. And, even if the pitch joint is broken in cold weather, when it becomes warm again the pitch will become consolidated and form a good joint, while with the cement once broken it is gone forever.

This pitch or paving cement is made of 100 pounds of commercial No. 4 pitch, mixed with 20 pounds of refined asphalt and 3 pounds of residium oil. This makes a compound that in this climate will not run to any extent in warm weather nor become too brittle in winter—a trouble that often occurs when ordinary pitch is used.

This work was done with still another kind of brick. Since 1895 the Eastern Paving Brick Company, of Catskill, N. Y., had perfected their plant, and were producing a good shale paving brick. Being near the Hudson river, so that they could ship their brick to New York by water, they had an advantage over Western manufacturers, and were able to quote lower prices to the contractors. The lowest bid for the pavement was $2.39 per yard, slightly more than Nevins street, but the pitch joint and extra labor of paving on a railroad street more than offset the reduced cost of the brick. The contract, too, was only for one short block. A portion of this work was also paid for by the owners of the abutting property.

The same year Classon avenue, from the Eastern Parkway to Washington avenue, and Washington avenue, from Classon avenue to Flatbush avenue, were paved with brick at the city's expense. This was a much needed improvement, as it connected the Eastern Parkway with the Willinck entrance to

View 4, Intersection of Washington and Classon Ave., Brooklyn, N. Y., Laid in 1897.

Prospect Park, making a smooth connection for all wheelmen and carriages from the entire eastern part of the city with the Coney Island cycle path and the Ocean boulevard, the popular drive of the city. These two streets were won by the same contractor, although bid for at separate times, and at different prices. The Washington avenue price was $1.75 per square yard, Portland cement joints and 6 inches of concrete foundation, while the cost of the Classon avenue pavement was $2.29 per square yard under the same specifications. Washington avenue is 42 feet between curbs, about one-half mile long, with but one cross street. The grade for quite a portion of the distance is about 4 per cent., and, as the surface is always kept clean, it presents a fine appearance to the eye, as can be seen by the accompanying illustration. The brick for both streets were from the Eastern Paving Brick Company, and have given good satisfaction.

In July of 1897 bids were received for paving with brick Fifteenth street, from Prospect Park west to Coney Island avenue, and Coney Island avenue, from Fifteenth street to Ft. Hamilton avenue. This would make another connection of smooth pavements with the cycle path and also give an improved pavement on the west side of Prospect Park. Unfortunately, however, this date was too near the time of the creation of Greater New York, and the contracts were not certified for want of funds. The price on these contracts was $1.99 per square yard, including a 6-inch concrete base and pitch joints. On account of the railroad tracks being in the street is was deemed best to have a pitch joint, as in the case of Nostrand avenue.

(To Be Continued.)

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

Our Silent Partners.

ONE OF THE BEST OMENS I see, in this convention, Gates, is the presence of so many ladies. I am no 'ladies' man,' but I want to tell you that we haven't half realized the importance of their attendance at these gatherings. They are really just as much interested in the business as we are. They are equal partners, and if we treated them more as such we would all be better off. It's all very well to joke about bonnets and ribbons, but their intellect goes beyond all that. They know very well we want them to look pretty and naturally enough they set off their pretty faces with ribbons and color and plumes, just as the Almighty meant they should do. But they go way beyond all this. They have ideas. They have energy. They have nerve.

"We great, big rough fellows, thinking we are the lords of creation, and lording it as such, forget, in the abundant affection and tenderness of our wives, what treasures they are. It is human nature. The greater our blessings the less do we regard them—that is, while they last. When the blessings are gone and it is everlastingly too late, then we realize it.

"I never knew what a priceless treasure God had given me for a wife, until the sod covered her from my sight. Then I began to realize how illy I had appreciated my treasure. I sit for hours now, dreamily thinking, living over our past lives, while *she* was with me. Days of pleasure and of pain. Days and weeks when together we fought the wolf from the door and battled for a living for us and for ours. Then, when sickness had laid me low, days when I thought the aches and pains an affliction now stand out radiant with the halo of her love and tender care. She who ministered to me is now an angel, and she was an angel then just the same, only my dull eyes could not distinguish. Just think of it. That great, rough, awkward hand has been fondled and caressed by one of God's purest and best angels. How she hov-ered over me and anticipated every conceivable want. How on earth she could go on doing this, night and day, fragile as she was, I know not, but she did; stilling a childish tumult here, adjusting a shade there and bringing to my fevered lips cooling potions and dainty dishes to tempt me back to strength, and which she had stolen time, in some way, to herself make. So great was her love that she could permit no one else to care for me or minister to me. And so that sickness seemed to shut out the whole world and leave us two alone together. My eyes followed her and ever looked for her, and I was restless and jealous if she were absent a moment, and her return brought me calm and healing. I seemed to live in her, and by her, and she was happy in having me all her own.

"Now, when I am ill, how sadly I miss her. How different the care of the hired attendants. But she seems still to come to me out of the shadowy past, and she makes me long for the death I used so to dread, for since she is gone my treasure is, indeed, across the dark river, and I long to go to her.

"The other day I opened a disused drawer in my desk and took out an old, worn and tattered pocket album. From it the face of a girl looked out at me. The curves were more rounded, and the cheeks plumper than on the wife I buried. The mouth lacked the droop of care that came after she was

my wife, but the picture that looked out was the sweet girl who consented to be my wife. What that meant to her I then in no wise appreciated, but I know now. 'For better or worse' was no idle phrase. 'In sickness and in health' was an absolute part of the contract, and 'Till death do us part' she took as the measure. For here there was only one such contract possible. She gave her hand and her heart once only, and that was, indeed, for longer than the contract read, for she meant for eternity. She is waiting for me now on the other shore." GATES.

Written for The Clay-Worker.

THE DENVER PRESSED BRICK CO.

Making Dry Press Brick—Six Weeks Drying and Burning.

THE ACCOMPANYING illustrations hardly do justice to the neat, well-arranged and excellent plant of this company, situated in the southwestern portion, within about fifteen minutes' ride from the center of the business district of the hustling city of Denver, from which the company takes its name. Your correspondent was piloted through this yard by Mr. S. M. Morrison, the capable president and manager of the company, whose experience in brickmaking has been varied, but judging from the fine product that is being turned out, he has "caught on" to the way to handle their clay. Brick is their only product, and they are satisfied to make one product, and make it well—a lesson which some other clayworkers might learn to advantage.

Arriving at the yard, which is under the immediate supervision of R. D. Lindsey, we first inspected the boiler and engine rooms and the machine shop, where there are facilities for making almost all needed repairs to machines, grinding their own liners, etc. We then went to the clay bank, where the material for red brick is obtained, situated about 200 yards from the plant. The clay is obtained by the common undermining and falling process and hauled from the bank to the dry pan by carts, where it is dumped, no weathering of the clay being necessary. From the dry pan, after being hoisted and screened by the usual methods, the clay goes to a mixing machine of Mr. Morrison's own design, which consists of a cylindrical hopper, or bin, made of wood, about 9 feet in diameter and 4 to 5 feet deep. In the center is a vertical shaft upon which, at about the top of the cylinder, are extending four arms at right angles. From these arms are suspended by chains similar cross bars, but not connected with the shaft. These lower bars are supplied with teeth upon the underside, and as they are revolved by the arms at tached to the shaft, thoroughly mix the clay and gather it to the opening, through which it is spouted to the machine. The chain allows the cross bars to rise and fall as the quantity of clay increases or decreases in the bottom of the hopper.

Only the dry clay process of making brick is employed at these works. Two four-mold Boyd presses are in use making about 18,000 bricks per day each. Mr. Morrison put in the first Boyd press ever made by Chisholm, Boyd & White, about twelve years ago, which was the old style Pitman-lever machine, in fact, he put in a second Boyd in May, 1890. After Chisholm, Boyd & White brought out their improved press, the Standard, 1891 pattern, Mr. Morrison disposed of the old style machines and put in the two improved Boyd presses, which he is now using. He also uses a small one-mold press for making ornamental shapes, shown in Fig. 4. From the presses the brick are taken on wheelbarrows of the type shown in the illustration, 80 to the barrow, to one of the seven ordinary up-draft clamp kilns of the company, which hold about 350,000 brick each.

A strange feature, peculiar to this company's clay, is the long time (four weeks) required for the watersmoking, in order to secure the best results. The burning of them requires one week, and the cooling process requires another week, a total of six weeks from the time of closing the kiln until it is ready for delivery. This seems all the more peculiar, because other clays only require from 8 or 10 days up to 21 days, depending upon their respective qualities. The price of brick at the yard varies from $8 per 1.000 for light colored brick—they really have no salmon brick—to $20 per 1,000 for the best grade and $100 per 1,000 for shape brick.

In answer to a query as to why he did not try some of the improved forms of kilns, Mr. Morrison said: "We are satisfied with 95 per cent. hard brick, and that while a different kiln might make a small saving in fuel, we do not think it worth the trial, especially as all of our product is salable, and all the bats made on this yard in a year could be hauled off in a two-horse wagon." This is a pretty good record, of which he may be justly proud.

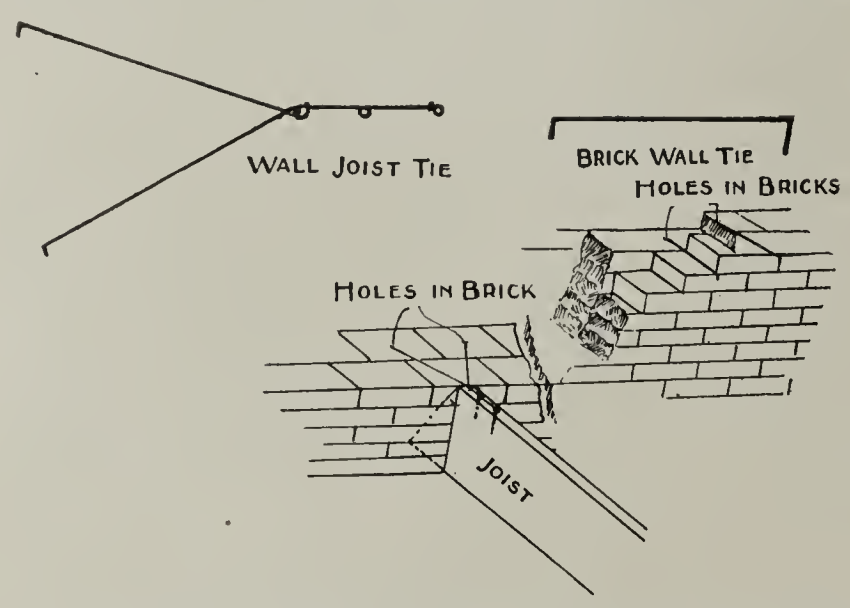
General View Denver Pressed Brick Co.'s Works.

In uniformity of size and color the brick made by this company are unexcelled, no sorting for either size or quality being at all necessary. With the exception of those at the extreme sides and top of the kiln, which run a little lighter in color, the brick are of a beautiful cherry red.

This company also makes a white brick of clay from their own bank, near Golden, Col., which requires about the same treatment as outlined above for red brick, except that some weathering is necessary to obtain the best results.

I would also like to call the attention of the craft to a new

tie invented and patented by Mr. Morrison, which consists of a piece of wire about seven inches long, bent at right angles, one end of which goes into a hole molded in the center of one side of the brick and the other crossing the next



row of brick and goes between it and the third row, or, if the wall be but 9 inches thick, it goes on the inside of the wall. The accompanying illustration will show this, and the arrangement of tying the wall to the girders, better than words.

This plant employs about 40 men, and wages range from $1.75 a day for laborers, to $3.50 a day for setters. They have never had a strike nor any labor trouble whatever, which is largely due to Mr. Morrison's personal interest in his men.

Of course, Denver, which is almost entirely a brick city, is the principal market for this company's product, but they also do their share of the business in the neighboring towns, shipping as far as Pueblo and Grand Junction. Business at this plant in 1899, as almost everywhere, has been good, and the prospect for 1900 is still better. They work nearly the entire year, and have a capacity of about 12,000,000 brick per annum.

I could not close this brief statement concerning this plant without a word about the personality of Mr. Morrison, the president, and Mr. Hitchcock, the secretary, who are both gentlemen of unusual courtesy and geniality. They are both enthusiastic clayworkers, thoroughly proud of their calling and their plant—justifiably so—and all brickmakers visiting Denver, I am sure, will find a hearty welcome at the company's office in the Cooper Block. A. NEWMAN.

Written for THE CLAY-WORKER.

MODERN AMERICAN FRONT BRICK. No. 26.

—Freezing Test.—

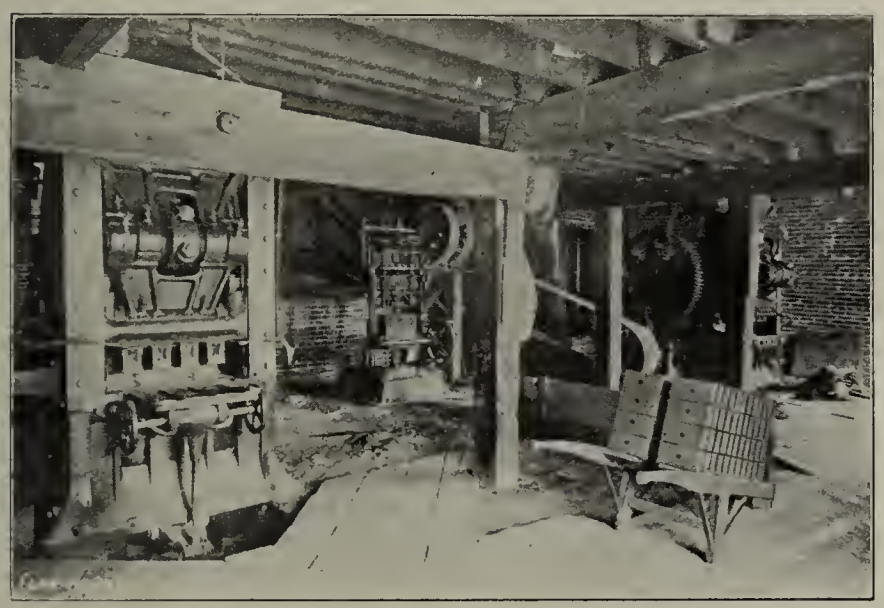
FUNCTION OF THE FRONT BRICK is twofold: they must be able to withstand the pressure due to the weight of the brickwork and they must resist the action of the weather, especially the disintegrating attacks of frost. As the manufacture of brick, especially of front brick, is being carried on at present, there are comparatively few brick made which, owing to soft burning, cannot withstand the action of frost. Manufacturers who still persist in underburning brick and who appear on the market with so-called salmon brick should be severely dealt with. The plea of low prices is a wretched excuse for soft burned stuff which no intelligent man will accept.

There are, however, conditions which influence the frost resistance of brick and which explain why some brick show a tendency to succumb to the action of frost sooner than others, although burned to the same degree of hardness. One of these conditions is the degree of porosity. It is a well-known fact that water increases in volume when freezing, the increase amounting to 1-9 of the volume of water, and to this property is due the destructive action of frost. The water absorbed by a brick expands when freezing and exerts pressure upon the pore walls of the brick. If the pores are small and numerous and the brick is soft the pressure exerted by the ice will break up the brick, since the weak pore walls cannot resist the pressure. However, the same soft brick, if it has large pores, may withstand the action of the frost without injury. In this case the cylinder of ice formed in the pore is given a better chance to expand out to the surface of the brick, and thus the pressure upon the pore walls is greatly diminished. In winter one can often observe small

Works of the Denver Pressed Brick Co.

needles of ice projecting from the surface of the brick as much as ¼ inch. Those small cylinders have been forced out by the pressure. It is not difficult to see that when the pores are large the ice can escape more readily than when they are small, and we are justified in saying that the smaller the pores the greater the pressure and the greater the danger of rupture. This fact also shows why porous hand-made brick often withstand the action of the frost better than equally well-burned brick made on an auger machine. The practical deduction is that the finer grained a clay is the harder it must be burned because the pore walls must be stronger in order to resist the pressure of the ice successfully.

Another condition which has an injurious effect upon the frost-resisting power of clayware is the presence of structural defects. Structural faults due to inefficient hand or machine molding give rise to spaces within the brick which may fill with water and which, on freezing, tend to burst the brick. It is surprising to note the number of brick which have failed due to this cause. The writer, on walking through the



Denver Pressed Brick Co.'s Press Room.

streets of his city, has seen a number of examples where brick have come to grief chiefly on account of faulty structure. In justification of paving brick in general it must, however, be said that the poor brick in question were made years ago, during the experimental period of paving brick manufacture, and cannot be considered hard burned in the sense of the modern paving brick.

A third condition having a bearing upon the frost resistance of clayware is to be considered in the case of glazed goods. Since, on the glazed surface, the pores are completely stopped up, any water absorbed, on being frozen, cannot expand in the direction of the glaze and hence a great strain is produced in the portion immediately under the glaze. The result is a remarkable tendency of the ware to disintegrate, or, at least, of the glaze to peel off. It is a well-known fact that many brick which stand the effects of the weather very well disintegrate when a glaze is applied to them. In order to be perfectly safe a glazed brick should either be thoroughly vitrified or be made of a strong, hard burned but porous material, such as is obtained from fire clay mixed with grog. In the one case no water whatever is absorbed and hence no freezing effect takes place; in the second there is ample opportunity for the ice to expand and hence does not destroy the brick unless the clay is so weak that it cannot withstand the pressure of the ice upon the pore walls. The question of frost resistance of unglazed front and building brick is not a very important one in these days, since most of the brick made are practically frost proof; our first class front brick are really beyond doubt in this respect.

The practical execution of frost tests is very simple as far as principle is concerned. The brick, or test pieces, are exposed to as low a temperature as can be obtained by means of freezing mixtures or a refrigerator and are then allowed to thaw as rapidly as possible, the operation being performed a number of times, usually twenty times. The test may proceed in such a way that the entire test piece is subjected to the cold or that only one surface is thus treated. In the first case the piece is dried, weighed and saturated with water, being placed in the freezing box or refrigerator in this condition. When frozen for several hours the brick are taken out and thawed rapidly. Any splinters which may be broken off are collected and weighed.

The second test is carried out only upon the surface of the test piece. Into a tin box there is placed a brick, face up, so cemented in that the face projects somewhat above the edge of the box. The latter being filled with saw dust all around the brick, up to the layer of cement the action of the frost is confined to the face of the brick, which is soaked with water. The freezings, of course, alternated with thawing, as before. In this way quite a severe test may be obtained. By means of an ammonia refrigerating apparatus very low temperature may be produced.

—Wearing Power.—

The wearing power of brick is best determined by means of impact tests, that is, by means of the rattler, whose latest modification is amply discussed in the reports of the N. B. M. A., to which the writer refers all interested in the matter. The rattler, as now being used, beyond doubt brings out the structure defects better than any other apparatus now known and, in general, brings out the value of a paving brick in the most practical and direct way. It seems that it would

Setting Dry Press Brick in Kiln.

pay almost every manufacturer of paving brick to have a rattler on the yard, testing to his own satisfaction the quality of his brick, in order to find out what mixture, what degree of burning and what rate of cooling will actually produce the best brick. For front brick, of course, a rattler test does not mean much.

—Hardness.—

This property of burned clayware is usually determined by abrasion tests, that is, by subjecting the material to be tested to the grinding action of a revolving iron or emery wheel for a certain length of time and under a certain pressure. But there has not yet been found a method which determines the absolute hardness of a material. A scale of hardness has been adopted by mineralogists, which is a rough approximation made by scratching a substance with a file and comparing the hardness with that of ten well-known minerals, which are:

(1) talc, (2) rock salt, (3) calcite, (4) fluorite, (5) apatite, (6) orthoclase, (7) quartz, (8) topaz, (9) sapphire, (10) diamond. Thus if a brick on being scratched with a piece of steel is found to scratch about like orthoclase (feldspar) we

may say it has a hardness of six. But the abrasion, as well as the rough, approximate, test have but little value to the brickmaker and the necessary information in regard to hardness is obtained at once by the experienced man by examining and knocking together the brick to be inspected. The abrasion test has some value for testing floor tiles and similar material where great hardness and density is required.

—Crushing Test.—

In considering the crushing strength of brick it must not be forgotten that the pressure to which they may be subjected is determined by the strength of the mortar. Since mortars nearly invariably are weaker than even poor brick it will at once become evident that the brick are never taxed to their full strength. A hard burned brick may safely be said to be equal to any pressure applied to it in ordinary construction and by far superior even to good mortars in regard to strength. Hence it may safely be said that to know the crushing strength of a brick is valuable only in special cases where the material is of a very weak character or where the brick are subjected to extraordinary pressure or strain.

The crushing test is made with half brick set edgewise. In subjecting the test piece to pressure pains must be taken to have the upper and lower surface ground parallel, and to have it centered perfectly. Usually the brick is bedded on paper or tar-board.

—Cross Breaking Strength.—

The test for cross breaking strength is made by placing a brick edgewise upon two rounded knife edge bearings about six inches apart and applying the pressure at the center of this distance. What has been said of the crushing strength might be repeated under this head. However, the cross breaking test detects flaws of the brick and structure defects much more readily than the crushing test and hence may be said to be of more value.

Special Tests—Permeability.—

In the manufacture of certain kinds of clayware it is necessary to know how permeable the clay body is. For instance, in the case of roofing tile it is both valuable and instructive to know how rapidly water is absorbed and how much of it in a given time. In fact, the value of a roofing tile depends on the requirement that it be water proof. The test for determining this point is very easy to make. A cylinder of glass, actually graduated, is set vertically upon a roofing tile, placed in the horizontal position. The bottom of the glass tube is cemented to the tile so that no water may leak out of the tube along the surface, but that all of it is compelled to filter through the clay. By noticing the quality of water absorbed by the tile in a given time the quality of the ware in regard to its use as a roofing material may be quite accurately determined. It is also quite essential to note the time elapsed before the water commences to trickle through the bottom side of the tile, if at all.

—Resisting Power of Glazes.—

Sometimes it is desirable to know whether a certain glaze, especially a lead glaze, will stand exposure to the weather. A simple test will inform us in regard to this. One or more pieces of glazed ware are placed under a bell jar and are partially immersed in concentrated muriatic acid. If the glaze is soft it will be attacked by the fumes of the acid in a short time and a white efflorescence will appear showing that the glaze has been decomposed. If the attack has not proceeded that far, but yet the glaze is deficient in resisting power, the fact will be observed by the appearance of an irridescent oily film in place of the original bright gloss.

—Resisting Power of Chemical Stoneware.—

In these days of enormous chemical manufactures the use of hard burned stoneware for the linings of retorts, condensing towers, etc., is steadily increasing. The main qualities required of this class of goods is resistance to the action of acids or alkalies, and the tests must bring out this point. The procedure is a very simple one. The material to be tested is ground quite fine, so as to go through a hundred mesh sieve. A definite quantity of this powder, say one ounce, is carefully weighed on an accurate balance and is then boiled for several hours in either the acid or the alkali, depending upon which it is to be used for; after the boiling the powder is washed thoroughly with distilled water, dried and weighed. The loss in weight is evidently due to the attack of the chemical and must not exceed the amount specified by the users.

—Pressure Test for Pipes.—

In order to test the strength of sewer pipe hydraulic pressure is used. The pipe is closed up water tight at both ends and water is slowly forced into it till rupture takes place. By means of a gauge the pressure is easily observed. During this test it is quite important to note when the water begins to flow in small streams through the pores of the clay, that is, at what pressure. Since, of late, clay pipe is begun to be used for gas lines similar tests could be carried on with compressed air at pressures corresponding to those used in gas mains.

Now, of all the tests mentioned in these papers, which are the most practical and most valuable ones? This, considering the great variety of clay products is a difficult question to answer. It is certain that there can be no prescribed set of rules covering all kinds of clays for all kinds of wares. What is applicable to the glazed brick or encaustic tile can evidently not be applied to the common brick. In order to judge what is fit and proper for a given case the services of the experienced and trained expert are necessary. Without systematic, carefully planned work, waste is sure to result in some form or other, as many examples all over the country amply testify. Nobody would intrust a high-class Corliss engine to the care of a man whose experience and training is limited to the handling of a portable saw mill engine. Why should manufacturers of clayware proceed to invest capital without availing themselves of technical advice?

A crude outline will, perhaps, assist in reviewing the field of testing and indicate the most necessary tests. Under the head of chemical testing we have the complete rational analysis, the determination of the soluble salts (giving rise to white wash), of carbonate of lime, carbonate of iron, and sulphide of iron. Under physical tests there are: The investigation of plasticity, of the burning temperature, temperature and rate of vitrification, melting point, shrinkage in drying and burning, loss of water in drying, density of both the green and burned ware and, finally, the absorption of water. The other tests, such as rattler test, will or will not be necessary, according to the kind of ware manufactured.

At the conclusion of these articles the writer wishes to state again that if these tests are undertaken and carried out with care and the results considered in the proper light they are exceedingly valuable, but if this is not the case they are useless. It is realized by the writer that justice has not been done by him to the various subjects and that, perhaps, also he has brought out things which are somewhat remote from the strictly practical side of the business, but he hopes that they may not have been entirely devoid of interest to the readers of The Clay-Worker. AMERICUS.

CHINA WORKERS WELCOMED TO NEW YORK.

The four Englishmen who came to this country on the Cunarder Lucania, under contract as expert china workers, were admitted under a clause of the contract labor law that is seldom used. They gained foothold in America because they represent an infant industry here, the manufacture of fragile and costly chinaware, an industry in which American experts are conspicuous for their non-existence, so to speak. The United States law, under these circumstances, permits the importation of foreign artisans.

The men on arrival were promptly detained, and the case seemed clearly one of contract and the men subject to deportation under the law. The quartet were bound, confessedly, for the Onondaga China Works, at Syracuse, N. Y., and they made no secret of the fact that they had come under contract. It was almost the first case of importation of china workers, and the cautious Board of Inquiry decided to defer the case. The members congratulated themselves on their foresight later when they learned that a lawyer of no less prominence than Gen. Benjamin F. Tracy had been secured by the china concern to handle the case.

General Tracy appeared at the barge office with several witnesses. His witnesses proved that some $9,000,000 worth of fine china is imported into this country annually. They also proved that in the United States there are only three manufactories of the finer grades of chinaware. Of these three, the one at Syracuse is the largest. The others are little more than experiments, and all three turn out less than $150,000 worth of the ware in a year. Having proved this, General Tracy pointed to the law permitting the admission of artisans who are coming here to help establish infant industries, the same help being unobtainable in this country.

Dr. Ullo, counsel of the Immigration Commissioner here, admitted the force of General Tracy's argument, and the men were at once admitted.—New York Journal.

Written for THE CLAY-WORKER.

THE CHICAGO SITUATION.

THE INDUSTRIAL condition in Chicago since my March letter has developed into a "corker." The subcommission of the United States Industrial Commission, consisting of Albert E. Clark, Boston; ex-Lieut. Gov. Andrew L. Harris, and John L. Kennedy, Washington, who came in response to an invitation from the Illinois Manufacturers' Association to investigate our industrial situation, held their first session at the Auditorium Hotel, March 20, and continued for two weeks. The primary object of the commission was to post themselves as to the commercial resources of the city, capacity of plants and other matters in line with their official duties, but instead of the voluntary witnesses cracking up the commercial possibilities of Chicago, the committee opened a jackpot which proved a hornet's nest, and in the recital by the manufacturers of the demands of union labor, and the attempted rebuttal testimony of the labor leaders, the investigation took an entirely different turn than anticipated, and the general public were given points which disclosed a situation without a parallel in the history of the city. As to building operations for the past month, it amounts to nothing, and the former hustlers in the different lines of material, are now gentlemen of leisure, and a condition exists which is nothing less than anarchy.

The old time Ku-Klux were considerate to the extent of masks and night attacks. The unions to-day neither assume masks or darkness, they simply swipe their victims any old time between 8 a. m. and 5 p. m., and that's all there is to it.

Chairman A. E. Clark, of the industrial subcommission, sized the situation before leaving the city, as follows:

"From the evidence we have heard it appears that the statutes are not being regarded in Chicago's labor contest. The labor men seem to enforce their own laws without respect to the laws by which all are bound. There are faults on both sides. It is evident, however, that the situation in Chicago is most desperate and something must be done else the future of the city seems discouraging. I am completely at sea as to what recommendations will be made by the full commission, but we all agree there must be more regard for law. The labor unions, in my opinion, cannot win by striving to enforce their laws by violence. Unless they respect the laws of the nation they cannot expect to have their own laws respected."

Our worthy mayor insists that we are enjoying a very orderly and decorous strike, but the enterprising reporters persist in turning in daily accounts of assaults. What the situation will develop in the near future is problematical.

—The Chicago Brickyard Consolidation.—

It is with pleasure that I give to the readers of The Clay-Worker an account of a new organization which consolidates nearly all of the common brick interests of Chicago and Cook county, by actual purchase. For the past four years the common brick trade has been anything but satisfactory. In June, 1899, the first definite steps were taken towards an organization which would not be hampered by leases or "previous attachments." A few of the leading manufacturers worked quietly with the one end in view of absolute ownership. Contracts were secured which expired December 31, but owing to unforseen delays it was impossible to complete the organization. Extensions to April 1 were secured, and on March 31 the organization was completed, and the Illinois Brick Company, with a capital of $9,000,000, was formally introduced to the business world. The following companies are merged into the new company: Alsip Brick Co., Becker & Runge, John Busse & Son, Evanston Brick Co., Harland Brick Co., Harms-Schlake Brick Co., Hayt & Alsip Brick Co., J. Hundrieser & Co., Jefferson Brick Co., Koeritz & Heier, Kuester & Thurlow, H. J. Lutter, Pullman Brick Works, Wm. W. Mensching, Thomas Molding Co., M. S. Meyers, Purington-Kimbell Brick Co., Reimer, LaBahn & Kuester, Robinson Brick Mfg. Co., Wm. W. Rohn, Wahl Bros., Wandroik & Co., Bernard F. Weber, Weckler Brick Co., Weckler-Prussing Brick Co., and Wolff & Blaul.

Many of the members of these firms antedate the Chicago fire and by their shrewdness and ability have done their part towards making Chicago the city that she is. The fact that these men are back of the Illinois Brick Company, irrespective of the enormous capital represented, would place the organization at the front in the manufacturing industries of the Middle West. The officers are: Leonard H. Harland, president; D. V. Purington, vice president; William Schlake, secretary; C. D. B. Howell, treasurer; Charles Ver Nooy, auditor; John H. Gray, superintendent of deliveries; Chas. H. Alsip, assistant; W. J. Melick, in charge of city sales; W. H. Terwilliger, in charge of country sales; Frank B. Alsip, general superintendent of works; Wm. H. Weckler, purchasing agent. Executive committee: Leonard H. Harland, president; credits and sales, D. V. Purington; personal property, W. H. Alsip; real estate and insurance, B. F. Weber; deliveries, North Side, Louis Reimer.

The offices are located in the Chamber of Commerce Building, sixth floor, and there are three suboffices, Western avenue and Roscoe boulevard (North Side), Twelfth and Rockwell streets (West Side) and at Englewood (South Side). All that is wanted now is a settlement of the labor question and our new company will then have a chance to show its ability, as the personnel of the management is the synonym of "get there;" all they want is the opportunity.

OFFICERS OF THE ILLINOIS BRICK CO.
Leonard H. Harland, President, and his First Grandson.
D. V. Purington, Vice-President. C. D. B. Howell, Treasurer.
Chas. B. Ver Nooy, Auditor. Wm. Schlake, Secretary.

In the organization of the company only those directly interested can realize the work and tact necessary to a successful end, and their experiences would fill a volume; but Providence decrees, in all human projects which end successfully, that all the disagreeable features be relegated to the past, and in this case I believe that the proverbial "white-winged dove of peace" (minus a few tail feathers) has a permanent roost at 618 Chamber of Commerce Building.

Chicago, April 10, 1900. VERITAS.

THE OHIO TILE, BRICK AND DRAINAGE ASSOCIATION.

Tuesday morning, Feb. 13, 1900.

THE TWENTY-FIRST annual meeting of the Ohio, Tile, Brick and Drainage Association was convened in the Council Chamber, City Hall, Columbus, Ohio, with the president, J. W. Everal, of Westerville, presiding.

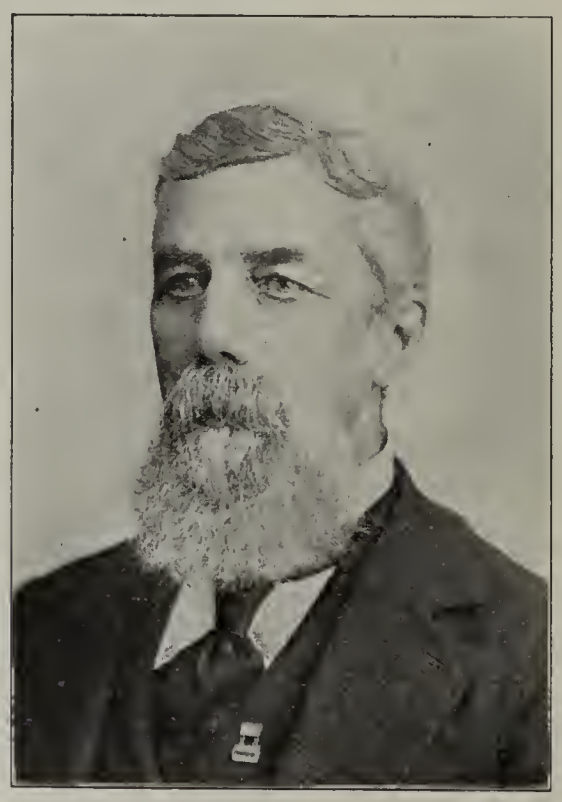
The Chair: I see quite a number of new faces here, as well as a few of the old faces we met in other years, and I am glad to welcome so many here at the opening session. The first thing on the programme this morning is the enrollment of members, a little duty we always perform before beginning the work of the sessions. The secretary will pass among you for the purpose of receiving your names and dues. The membership fee has not been changed, but remains at one dollar. We will be glad to have all become members and take part in the coming sessions. As we have not all met for at least three years, I presume each member has something to say regarding the condition of trade during the past three years. The secretary will call the names and you will respond as your names are mentioned.

—Reports of Members.—

J. J. W. Billingsley: Mr. President, I am very glad to be with you this morning. It has been several years since we met in this hall. There are, however, some sad thoughts in connection with it, that many of those who used to meet with us are with us no more. There are a few new faces and others with whom I became acquainted years ago. I trust you have all come for the purpose of taking active part in the proceedings of the association, for this meeting will be largely what you make it. In the past three years we have experienced quite a change in the business of tile making and selling. Three years ago it was indeed very dull, and in fact two years ago it was dull. But in the last year or fifteen months there has been quite a revival in the business. The information I have from my correspondents is quite general that they have not a supply of tile on hand to meet the demand and many are increasing their capacity. The future of the tile business is promising. I shall address you more at length on this subject, however, when I come to treat of drainage and its benefits.

J. D. Fate & Co., Plymouth, O.: We are not manufacturers of tile, but manufacturers of machinery. We have had all we could do the last two years and more than we can do this year.

Landrum & Landrum, Centerberg, O.: It is a little bit quiet with us and has been since 1894. Some men talk about having a bigger trade this year than last; with us it is the reverse. We had a better trade from January to January, 1898, than we had in 1899, and I don't know what we will do this year. So far, it is fair—no boom. It may be because we are not in a prosperous part of God's heritage, but our trade has been rather quiet since 1894.



J. W. Everal Westerville, Ohio.

H. D. Weaver, Sparta, O.: I live in the same section of country as Mr. Landrum and what he said with regard to his trade is about true with regard to mine. I think my trade was fully as good three years ago as last year, and better, perhaps, than this winter. Since December it has been very light, but it may possibly be due to the bad roads and the consequent inability of the farmers to haul tile. But we have had no boom in the tile business. We have been making some hollow brick and some common sized brick and these have added to our sales, and by having the three we have managed, as the saying is, to "keep soul and body together," but have had no big trade, and I do not know that the outlook for the future is any better.

E. L. Luther, Adrian, Mich.: We are not manufacturers of brick or tile, but of machines for making them; more machines sold in 1899 than in 1897 or 1898, and prospects for 1900 very encouraging. Think there will be good trade in building block and brick on account of high price of lumber.

S. Fish & Son, Milan, O.: Not complaining of too many sales, but hardly think we are a true barometer of the tile business. We are one of the old ones who started before the war. I would like to know how many representatives of the tile business there are here who started in before the war —the war of the rebellion.

The Chair: I guess you are alone.

Mr. Fish: I am the only one apparently. That is one reason, perhaps, why we are not doing as much as some of these younger people. Of course, the best farmers in our vicinity have their farms underdrained, and, when once well done, it is done for all time. Another reason is that we have been surrounded by a great many other yards which has cut off our territory. Another reason is that prosperity, which has struck other industries, as the iron, glass and lumber, has not struck our farmers; consequently farm products are not booming like the others and they are not buying as rapidly. We are not complaining, however; we don't want to get rich and are quite happy.

The Duval Brick & Tile Co., Duvall, O.: Mr. Chairman, our business, we think, in fact we know, is better than it was a few years back. We got started in times of depression and did not have very good sales for the first two or three years, but the last year or two has been considerably better with us; in fact, since we quit making tile we have had a better trade than we had before.

John W. Kellough, Cook, O.: I was just thinking at the outset, when this response commenced, of a meeting here

eighteen or twenty years ago. Of course I knew the responses would not be now as then, when everything was booming and the general response was that we could not supply the demand. We have been in the clay business for nearly twenty years and since the beginning there has been a gradual decline. For a few years prices were kept up, but ever since there has been a gradual decline in the price of manufactured ware. We have merely manufactured to supply the local trade, as we have only a country plant which we operate and manage with the farm work. Our people have not finished draining their land. Some think they are fairly drained and are resting for the present. The farmers are not particularly prosperous, even at the present prices of wheat and corn. Though they are getting 62 cents for wheat and 28 cents for corn, it does not really amount to as much in the aggrgeate as during the depressed period when wheat touched 45 cents. But we have been making some hollow building blocks and brick, and it seems to require more of that annually. Brick are like nails—it seems that the country must have a constant supply. However, we notice that other industries are having somewhat of a boom and are hoping it will come our way pretty soon.

Mr. W. W. Chadwick, Condit, O.: I don't know whether I have much to say. Three years ago times were pretty bad and we had a hard time to keep up as our sales were nearly all time sales. Last year we had far better collections and did a much more satisfactory business than in 1897. This year the prospect is far brighter than the last three years. Sales are nearly all cash sales and we have good substantial buyers. I think the prospect is for a brighter future in the tile business.

T. A. Horn, Lilly Chapel, O.: Our tile business is somewhat limited. We have a summer factory and quite a good deal of opposition, but my trade has been good this winter, and during last spring and summer, and we have good prospects for disposing of everything we have on the yard. We have in our county a system of county ditches which use 10 or 12-inch tile, and prices have somewhat depreciated owing to so much competition. But in the last year we have taken the stand to try and raise the prices and have accomplished something.

Harry Landrum, Hebron, O.: Mr. Kellough over there voiced our sentiments, as ours is mostly a wheat and corn country. Trade has been no better lately and the outlook is not encouraging.

M. D. L. Mentzer, Kenton, O.: Our trade for the last two years has been good. We have sold everything we have made and the prospects now are better than they have ever been. There is a good deal of heavy ditching being done and big tile put in. There is a big demand for tile and we cannot supply the demand.

Alvin F. Potter, Worthington, O.: The tile trade has been pretty fair the last year and about the same outlook the coming year. Sales on hollow brick will nearly double, I think, this year over last.

R. M. Imbody, Agosta, O.: Our sales have been good for the past year and prospects for trade in the future are good.

H. C. Smiley & Son, Odon, Ind.: Think we made more tile last year than ever before and had better sales, and the future is very promising. We make quite a number of brick also.

J. W. Huffman, Pleasant Bond, O.: The sales last year, I think, were not as good as the year before. The wheat crop has been a failure in my section, but we had fair sales last year. Competition makes my prices low. Prospects are fair.

E. Biglow, New London, Ohio.

E. M. Freese & Co., Galion, O.: We are not brick and tilemakers, but makers of tile machinery. Business has been good the past year, and prospects bright for the future. We could take care of more business, however.

J. M. Elder, Bloomington, Ill.: Have been successful in working out a perfect screen for their own purpose, and propose helping brother brick and tilemakers by placing the same at their disposal.

Joseph Hickson, Mt. Gilead, O.: I am in the brick business, and for the past year the brick business has been better.

Brice Clay Co., W. C. Wilson, Brice, O.: I do not know just where to begin. I would say, however, that our trade for the last two years has been extraordinarily good, and the financial status has been better than we have known it in the last seven years. We are carrying less accounts on the books to-day that represent cash and sales than ever before. In 1893 to 1896 we were carrying from $6,000 to $8,000 on the books. We took an invoice on the first of January, and, with sales equally as great or greater, we had then less than $2,000. That indicates better business. The call for large sizes has been greater than before, and has overtaxed our capacity. I have faith in the prospects for the coming year, and, indeed, for the next two years, as far as I can observe from the present standpoint.

F. E. Swift, Washington, Ia.: I also run a little one-horse tile and brick plant. I have been running for fourteen years there, and have not yet shut down on account of hard times or anything else. I think a great many people make a mistake in shutting down when they have got a few tile ahead. My experience has been to the effect that it is better to keep on making tile or brick and pile them up. When the farmers get ready to tile they all want tile at once. I make tile in winter and brick in the summer time. Work about twelve men in the summer time and about seven in the winter. I consider that I have made a success of the business. I have leased my tile plant now to my son for the coming year, in order that I may devote my time and attention to my kiln and furnace business.

J. W. Everal, Westerville, O.: Gentlemen, we have not been so crowded with business but what we have been able to take care of our trade in the last year, but can say we have had a very nice trade. It has been so much better than three or four years prior to 1899 that we look forward with very good prospects for the coming season—that is, the spring and next summer. The trade has not been, I think, as we have seen it, back in 1892 or 1893, or in the 'eighties, but it has been quite satisfactory the past year, and very encouraging.

Ed F. Darnell, Grove City, O.: My trade has been about the same since 1897. The dry weather in my locality hurt the business with me. There was a deficiency of about eleven inches in the rainfall, and any tile man knows that a deficiency in the rainfall means a deficiency in the tile business. If the wet weather continues we will have a good trade. The trade has not been so heavy but we could do more business. We do not make much in winter, but, as the drying costs me nothing, I could run the year round; but I do not think it practical to make in the winter, if I can make enough in the summer for my trade.

The Chair: This practically completes the morning programme, with the exception of the President's address, which I will not inflict on you this morning.

Adjourned.

SECOND SESSION.

Tuesday Afternoon, Feb. 13, 1900.

The meeting was opened by President Everal, who announced that the Secretary would wait upon those who had arrived since roll call at the morning session, receive their dues and enroll them upon the membership list.

The President then addressed the convention as follows:

—President's Annual Address.—

Gentlemen of the Convention: We are glad to greet you and welcome you to this, the twenty-first anniversary of the Association, in this the closing year of the nineteenth century. It may be said of us now, we are of age.

In looking back over the twenty-one years it would seem we were born full size. Numerically we are now no larger than at birth. While the Association has not materially increased in numbers there has been a notable increase of clayworkers throughout the State Again, while all the clayworkers of Ohio have not seen proper to join hands with us in helping to maintain an organization, it cannot be said that the Association has been of no benefit to those engaged in the business. The many valuable papers that have been prepared and read at these annual meetings, treating as they have in detail the various improved methods of making, handling and burning clay ware, have been sent to every known manufacturer in this State, almost free of charge. They have had the very great pleasure of sitting by their kiln fires and reading how Sam Slick made perfect tiles from his stubborn clay at a profit; how Joe Tidy constructed his buildings and arranged his kilns to handle the ware at a minimum cost, and how Simon Widewake managed to burn his tile with less fuel and without cracking, changing a damper here and one there, getting a uniform burn and a satisfactory result. Those of you who have not attended these Conventions and have derived benefit in any way from the papers and discussions are to be congratulated on their good fortune. God bless them. We wish them long life and prosperity. To those who have contributed to the Association and the good of the fraternity I would say, we hope the recording angel will reward you at the last day. Twenty-one years have marked many changes. Some of the pioneers have passed to their reward; others have gone out of the business, while new ones have taken their places. There are still left a large number who have been in the business for more than the twenty-one years. Not all who have thus stuck to the clay bank have had smooth sailing, but have met with discouragements and heart-breakers, as boys are apt to meet with in their scramble for supremacy. All of we old boys can look back over the past twenty-one years and mark the waves of prosperity as well as those of the other kind. The wave that swept over the country the three and four years prior to 1898 will be remembered as a "holy terror." Money took wings, or, rather, crawled into a hole, securities were out of sight (down below), tile and brick became moss-covered and cringed beneath the scorching sun and howling blasts of winter. There was no eye to pitty. They remained upon the yard in a helpless condition. The would-be user shied his castor, and if by chance we got a purchaser we felt like taking his picture for future remembrance. As misery loves company, the tile and brickmaker were not alone. All over this broad land, upon the farm, in the workshop and factory, hung the sign, "No Hands Wanted at Any Price." This sign hung there, with all its forebodings, sending disaster and distress to many a little craft—and big ones, too—until one, a lover of the sons of toil, with one stroke of the pen, scratched out the word "No," and then it read, "Hands Wanted at Any Price." Will the lesson of the recent past be forgotten? They too often are. And now, with the return of prosperity and increased activity in all branches of trade, the tile and brick trade not excepted, the speculative idea seizes some minds, and trusts and combines are having their day. The exceedingly favorable business conditions that have existed for some little time past have made it possible to maintain a speculative value upon industrial securities, but we think the greater part of these speculative organizations will sooner or later collapse of their own weight. The tremendous slump in trust stocks which occurred in December last is only a warning of what is to follow. Competition is a natural law of trade which cannot be stifled. It may be overridden for a time, but it must eventually assert itself, and only those business enterprises organized upon a basis recognizing this law of trade will survive. The combination of capital in the manufacture of tile on an extensive scale, and the swallowing up or wiping out the smaller factories, in my opinion, is still remote, although we confess to believe that concentration of capital is a potent factor in any business. There has been quite a decrease in the number of tile factories in the State during the past five years, and we think there will be a further decrease in the next five years to come. The causes are various—a lack of business methods with some; others engaged in it as a side issue to other business enterprises; some because the gross daily output of their neighbor's factory was taken for net profits, minus a few incidentals. Hence, from some of these causes, or kindred ones, the price-cutter comes into existence. How to exterminate him is a question not quite solved. There is one remedy against the evil I would suggest—that is, look well to your own factory and trade, quality of goods and courteous treatment of your customers. It will do you good, even if it does the price-cutter no harm. The future outlook of the tile and brick business is encouraging. The demand for brick in most all sections the past year has been good, with little disposition to cut prices. Hollow building blocks, both for foundation and the superstructure, are fast coming to the front as a building material—the red, both rocked and plain. The dark glazed and the terra cotta all have their share of the trade. A combination of the different shades adds very much to the beauty of the structure. During the past year, in Columbus and vicinity, some pleasing effects have been produced by the red and buff or red and brown. A house trimmed with a different color from that of the body is much preferred. We think manufacturers of blocks can do very much towards increasing their sale through architects and contractors and by thoroughly working the trade. The price lumber is now selling at is a very good time to push the sale of durable building material. The question of difference in cost is in favor of brick and blocks. The sale of tile largely depends on the prosperity of the farmer. When the products of the farm are ruinously low, as they were in the recent past, and farmers have hard work to make ends meet, the tilemaker is sure to share in the hard luck. During the past year or more farmers have been enjoying prosperity. Crops have been abundant and prices fairly good, with a demand for all surplus. Stocks of all kinds have brought from good to high prices. With a continuance of these conditions, and the good Lord will send plenty of rain, the tilemaker will have no reason to complain of sales. The dissemination of a better knowledge of tile drainage is a part of the work of this Association, as well as each individual tile manufacturer. Our coming together annually for the discussion of the various branches of our business tends to increase our own knowledge and prepare us to impart information to our customers. We cannot hope to increase our trade in either branch of the business without earnest, energetic work. A manufacturer of tile and brick wrote me recently he did not have to drum trade now, the trade drummed him. This is rather a good fix to be in, unless he is selling below cost, but usually with a good demand good prices can be maintained. In almost every vicinity there are farmers that are so prejudiced against anything new, or that their grandfather's did not use, that it would take a nine-inch jackscrew to lift them out of the old rut. Barring a few exceptions, the human family is susceptible of having their minds changed. Did you ever calculate how much one man in a neighborhood, by persistent effort, both by precept and example, could influence his neighbors toward the improvement of their farms as well as their morals?

We are creatures susceptible of being influenced toward the right or wrong. We are looking for an example; then, as tilemakers, having faith in our good work, use our influence toward the betterment of mankind and improvement of the country. I don't believe in the theory as given by P. T. Barnum, that the American people love to be humbugged. Recently, in conversation with one of my customers, I gained this information. Said he: Twenty-three years ago we began buying tile of you, and every year since have put in a few rods, some years ago a good many. I still see places that need them, and expect to

keep at it so long as it pays good interest on the investment.

For several years past I have been using fertilizer, and find it pays exceedingly well to do so. My neighbor, Mr. H., who joins farms with me, and who has been using fertilizer also for a few years, declares it don't pay to use it. Mr. H., as you know, has done very little tiling.

And now, after having seen the results of fertilizers on my drained land, has decided he will use no more fertilizer until he drains his land. Mr. F. remarked there is no dodging the fact that tile drainage lays the foundation for successful farming, even the success of commercial fertilizers are dependent on tile drainage. What of the future? Naturally enough the inquiry arises in the mind of every person what of the future, what has the future in store for me. If it were not for hope, that great anchor of the soul, we would most miserable be. We hope for better things, we are buoyed by the hope of better days in all that tends to make life happy. In a spiritual sense our future happiness depends on how well we improve the present, we make our future as we live to-day.

Our future success financially is governed by how well we manage our afrairs at the present, we may judge of the future by the past. We look back over the past 21 years and see what marvelous improvements have been wrought. The American mind, energy and genius is ever reaching out to greater achievements. We are not only living in a marvelous age, but in a marvelous country—a country which holds the very best in this life in its grasp; a country of self-government, of self-education. The possibilities of the future can hardly be conjectured. A thing is only to be conceived of to be finally a reality.

We have much to be thankful for. Great are our opportunities and great are our responsibilities.

In conclusion, I could not more fittingly portray the possibilities of the future than to give you the prophetic words of an esteemed Governor. He said:

"I think I see a vision of the future opening before me. I see triumph in art and achievements in science undreamed of by the artisans and philosophers of the past. I see the sun darkened by clouds of men and women flying in the air. I see throngs of passengers entering pneumatic tubes in New York and emerging in San Francisco two hours before they started. I see the gloved and umbrellaed leaders of the Populist party sitting in their horseless carriages and singing the harvest song, while the self-adjusting automatic binders sweep, unattended, through the fields, cutting and binding and shocking the golden grain. I see swarms of pauper dukes and counts kissing American millionaire girls across the ocean through the kissiphone. I see the women marching in bloomers to the ballot box and the men at home singing lullabies to the squalling children. I see every Republican in America drawing a pension and every Democrat holding an office—and every 'culled pusson' riding on a free pass." And then, I think, the millennium will be near at hand."

Not all of these things will come to pass, and we could not wish them all in the next century; but great advancement will be made in all things in the glorious century into which we shall soon enter. (Applause.)

The Chair: The next number on the programme is "Construction of a Modern Brick and Tile Plant," by W. C. Wilson, of Brice, O.

The following paper was read by Mr. Wilson, who illustrated the same by means of large drawings:

CONSTRUCTION OF A MODERN CLAY-WORKING PLANT.

By W. C. Wilson.

Mr. President: The last active meeting of our Association, held at Zanesville, in February, 1897, many of you doubtless remember, as one day was spent as guests of the clayworkers of the greatest of clayworking cities in Ohio. If you gave a thought to the divers methods of the construction of the many different works we visited you will remember we had a grand chance to lay up something for future contemplation and for the betterment of our own methods. Especially is this true if we have the ability to make the application to suit our works.

In the make-up of a paper on our subject it is fitting, perhaps, to look back some thirty or more years ago to be able to compare progress in one-third of a century. I feel my inability for this task,

W. C. Wilson, Brice, Ohio.

but if my experience will count in the deal I will, in a manner, recount my observations of improvement.

The many machines and devices in use to-day for the preparation of clays and material for our manufacture have been invented almost wholly in this time. This proves that man's advancement in this industry is keeping pace with the law of supply and demand.

The finely arranged buildings in use now for clay manufacturing are monuments of our inventive genius. The rude shed of our early time, which afforded a poor protection from storm, or a too hot sun for our brick, was in our childhood of clayworking considered good enough. We read our lessons from the primers of men, who in turn had received them from others without the facilities for advancement, even had they at that time the ability. It took time, of course, for the indomitable American spirit to begin and understand the word excel even in common brickmaking.

In the early seventies we heard of machines to make both brick and drain tile, combined machines. The farmers, too, at about that time in Ohio had learned from the New England States that underdrainage with burned clay was much superior to timber and stones, and the demand from them for an experimental test induced us to invest in the business of drain tile and brick manufacture. I often look back to this venture. We only knew of about two manufactories of this class of machinery, and in choosing our machine it was a difficult point. If we bought of one the other would say we made a mistake, and if we took the other we might wish we had never bought at all. No doubt the early experience of my fellow-clayworkers run in this same channel. Now, if we want a machine to prepare our clay or for manufacture, we can select them in abundance, and make no mistake if we choose any or all of them. I would, however, advise you to buy strictly on trial.

The kilns of to-day are wonderful, too. I expect to hear in the next few years of one that does the work without fuel, so perfect are our kiln inventions becoming. Look, if you please, in the advertising columns of our clay publications, and you will find that each new kiln burns with one-half the fuel of his neighbor (at least on paper). If so, what may we not expect in the future?

The subject of our buildings has not kept pace with the machine or kiln and dryer inventions. I have studied the subject in connection with economical manufacture, and think, while you may have a good plant in so far as the matters I have enumerated above are concerned, it is not complete these days unless the whole outfit is modern.

For the benefit of our younger workers I would urge, if you can afford it, not to lose sight of the experience of yourself and others and profit thereby. If you are rebuilding take some time and a little money and learn what you can from others longer in the clayworking business. In your travels should you run across a building, such as I have here a draft of, study the plan carefully and you will no doubt arrive at this conclusion: that like the machine men, the kiln men and the dryer men—all are good in their place. The writer has been asked many times by experienced clayworkers what would be the first thing I would do if I was to commence the business again, or what would I advise a beginner in the manufacture of brick and tile to do?

I would answer: First, look up the Ohio statistics, and be sure the business, with its 866 various clay establishments, needs one more. If it did, and I was the "fellow" to do it, and did not have the capital to commence at the top with a plant of many kilns, I would start at the bottom with one 20-foot kiln and construct my building so I could add thereto as occasion required. In beginning this way, if I had to fall, for lack of patronage or ability, the fall would not hurt so bad. The building would be the main point from an economical view. I would build of brick or hollow block for my dry floors, a building say 40 feet square, three or four stories high. It is cheaper to build additional floors under one roof, away from earth moisture, than to spread out with one story on the ground.

My kiln should adjoin my main building, and under a roof, so as to protect from the storm, and so constructed as to utilize all the heat wasted in burning and cooling my ware.

I would build a stack, if down-draft kilns were used, large enough for at least two kilns and a steam boiler. This stack should be not less than three feet square inside and about 50 feet high. If it is properly constructed at the bottom we can burn two kilns at once if we have them.

It requires about 3,500 feet of dry floors for a 20-foot kiln for drain tile or common brick. Set your brick, if stiff mud mold, on end to dry on your floors. Be sure and always set dry ware in your kiln to burn. Don't make a tunnel dryer of your kiln if you can help it. If you wish a tunnel dryer we have room for their construction in our modern plan, and all under roof. Don't set your brick in your kilns too close. Please abandon the ancient idea that a kiln holding 70,000 of brick or its equivalent in other ware can be burned with the same amount of fuel as can 50,000.

Also, don't, in these days, do any guessing in your work, especially in burning. Learn to burn with a scientific idea of heat. Study and watch results; become proficient in your management, and don't be satisfied unless your ware is a little better than your neighbor's. Then all will be well. (Applause.)

DISCUSSION.

Mr. Darnell: Mr. Wilson has part of my plans here. That is the way I have my factory built.

Mr. Blaser: I would like to ask some questions concerning this plan, because the question of drying our ware by other than ordinary methods has interested us for some time. How do you utilize the heat from your kilns?

Mr. Wilson: Of course, it is supposed the building is air tight. In utilizing the heat from the kiln for drying it is absolutely necessary that we shut off the outside air, but we must arrange to let in outside air if we need it. Here is one little point. Of course, the heat is originated here (indicating kiln). The heat will naturally rise up here, where we draw it into this building, under the roof of the main building. It simply permeates all through. It dries by permeation. In the basement here we have flues (and this is the point I want to call Mr. Darnell's attention to, because I don't believe he has this).

Mr. Darnell: Better come and see.

Mr. Wilson: As the moisture goes toward the ground—I am talking about the heat from the kiln permeating all through the building, drawn in up under the roof—the moisture will all go down. In the basement there are steam pipes, and here are ventilating chambers (indicating on drawing), three to each side. These are about 12 inches square, with flues in the brick wall opposite to the bottom in the basement. That acts as a draft. As the moisture goes down it follows this draft and rises up through these chimneys. The heat and moisture will all escape through the flues. They are all built tight in the brick wall.

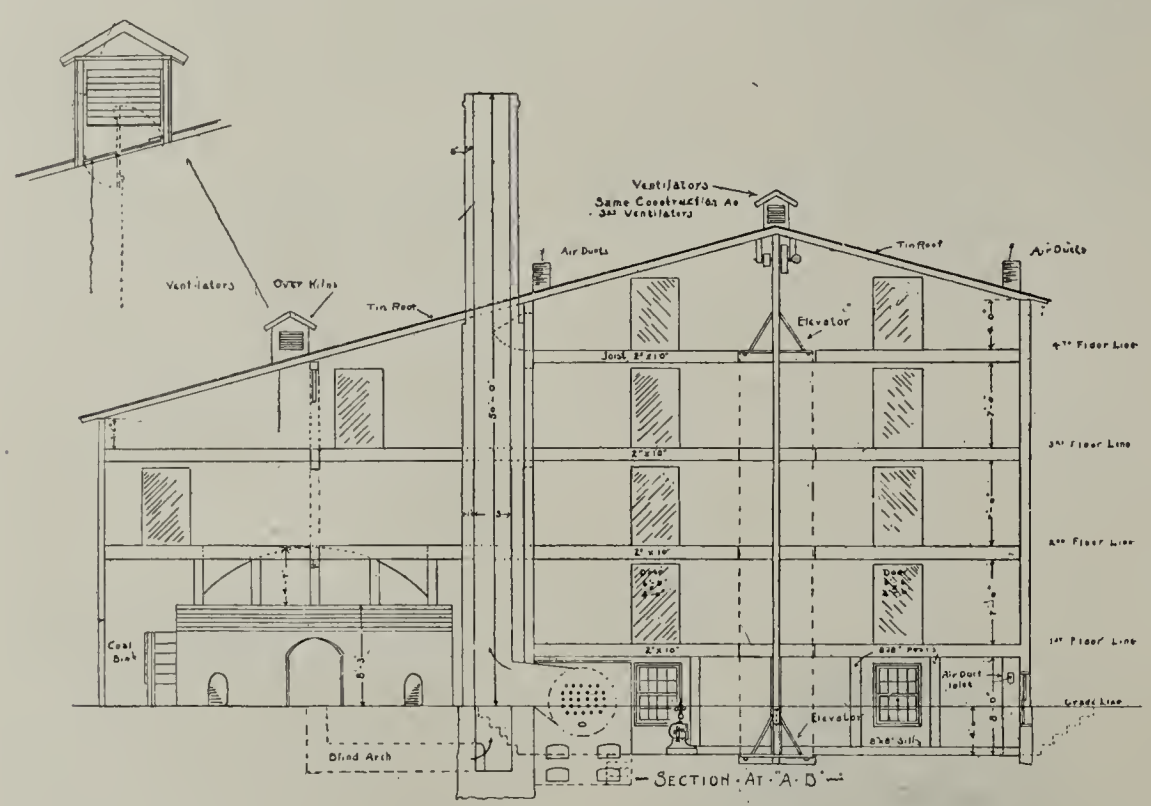
Mr. Blaser: We have a building 145 feet long and 40 feet wide, no basement, and two stories high, and it always seemed to me if we could get the heat from the kiln, which is all lost, it would be very advantageous to us. We constructed our building from lumber, and closed it up tightly, but the question with us has been how to get that heat from the kiln into it. It seems to me there should be a way, and so produce a great saving. We do not run in the winter time, because we have not reached a point where we wanted to spend money for steam piping. The matter of using exhaust steam for heating never seemed to me practicable.

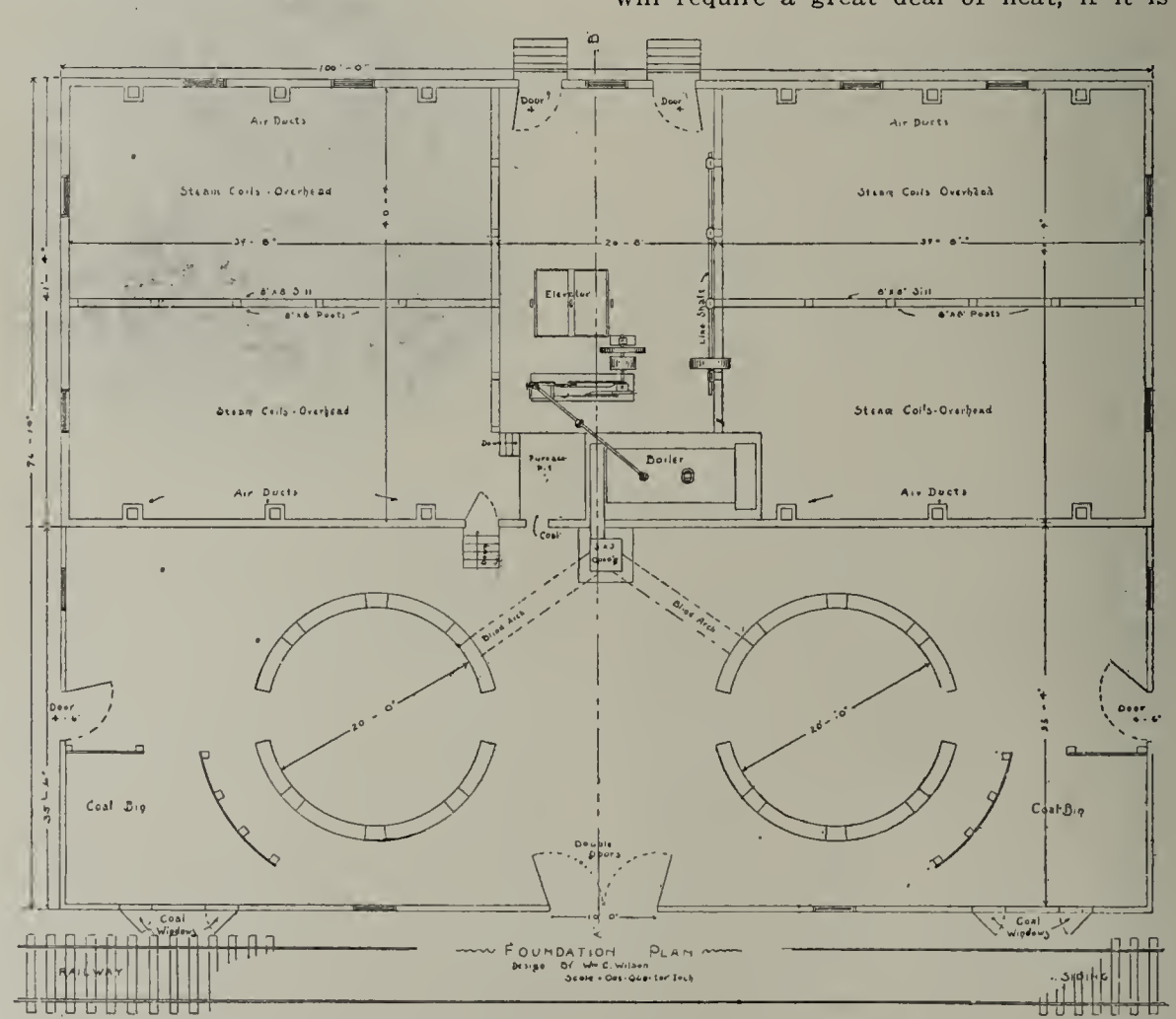
Mr. Wilson: Is your kiln in close proximity to your dry shed, so you can use this heat?

Mr. Blaser: It is off thirty feet. The building runs north and south, and there are two kilns on the east side. It is about thirty feet from the kilns. We come down from the second story on an incline, and raise our wares with an elevator.

Mr. Wilson: Your kiln and dryroom ought to be really under one roof, immediately together.

Mr. Blaser: I thought we could run an addition out over the sheds.





Mr. Wilson: You would get a good deal of heat by permeation that you now lose if you have room enough to build between your kiln and dryrooms—build an addition.

Mr. Blaser: Has anyone had any experience in using tile to heat the building from the ground, instead of with pipes—using wood or coal?

Mr. Wilson: Mr. President, there was such a system in use at the works I have charge of, but it has never been in operation since I have been there. It was not a success. The flues were built of tile under the building. Possibly the fault might have been in the construction and not in the principle.

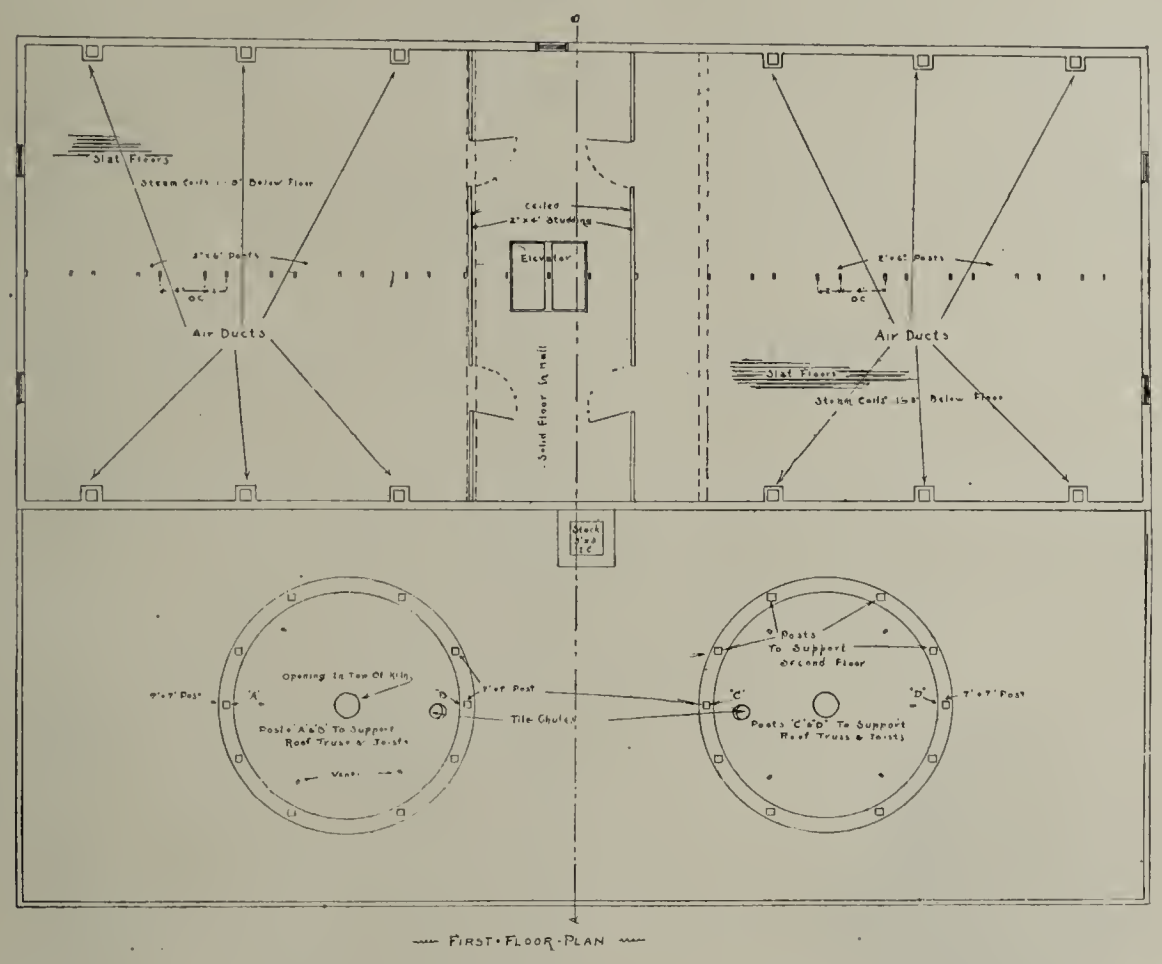
The Chair: We have a building 24 by 60 feet that we have endeavored to heat that way late in the fall and early in the spring. We used 12-inch tile, two rows on either side of the center, and having a furnace on each side of the center, connecting with the tile, and connected at the further end with a flue running to the stack. We found it takes too long to heat through the tile to get sufficient heat up through the floor. Afterwards we took out the tile and built up the walls on each side of the flue and covered it with sheet iron. We could then do a pretty fair business in drying, but it has not been entirely satisfactory.

Mr. Blaser: Is drying with steam, using exhaust from the boiler, successful?

President Everal: We have in the same building a system of steam pipes under the floor, and use the exhaust from the engine in extreme cold weather.

Mr. Eudaly: I have operated a dry floor myself, and seen a good many of them used similar to the one the gentleman asks about. It is not a new thing at all. I have seen them built with drain tile and a great many of them with brick. I think I never saw a dry floor for making high grade pressed brick; in fact, I never saw a dry floor of any kind for making repressed brick that would equal this kind of a floor. The trouble, I presume, in the case of Mr. Everal and some more, is that they expect too much and expect it too quick. This kind of a floor will require a great deal of heat, if it is built properly, to heat it. I had a dry floor that would dry brick for a week after it was heated without a pound of fuel going into it in the summer time. I don't suppose it would last so long in the winter time. The floor I used I think must have been somewhere from 150 to 200 feet long—I forget the width, but it was quite a wide building. This floor was built by going down into the ground and laying walls four inches wide with brick, leaving spaces of about four inches or a little over, so an ordinary brick, the same as

used in laying the walls, would just meet when laid crosswise on the floor. We built those flues about fifteen inches high, then laid brick all over those flues flatways, and then we covered it all with earth. At the end next the fires there was about two and a half or three feet of earth; at the other end about a foot of earth—fine earth, sifted and all tamped down well.



FIRST-FLOOR-PLAN

The outlet of the flues was considerably higher than next to the fire. We had to dig a pit about the fire, and they had to get down into the pit to fire.

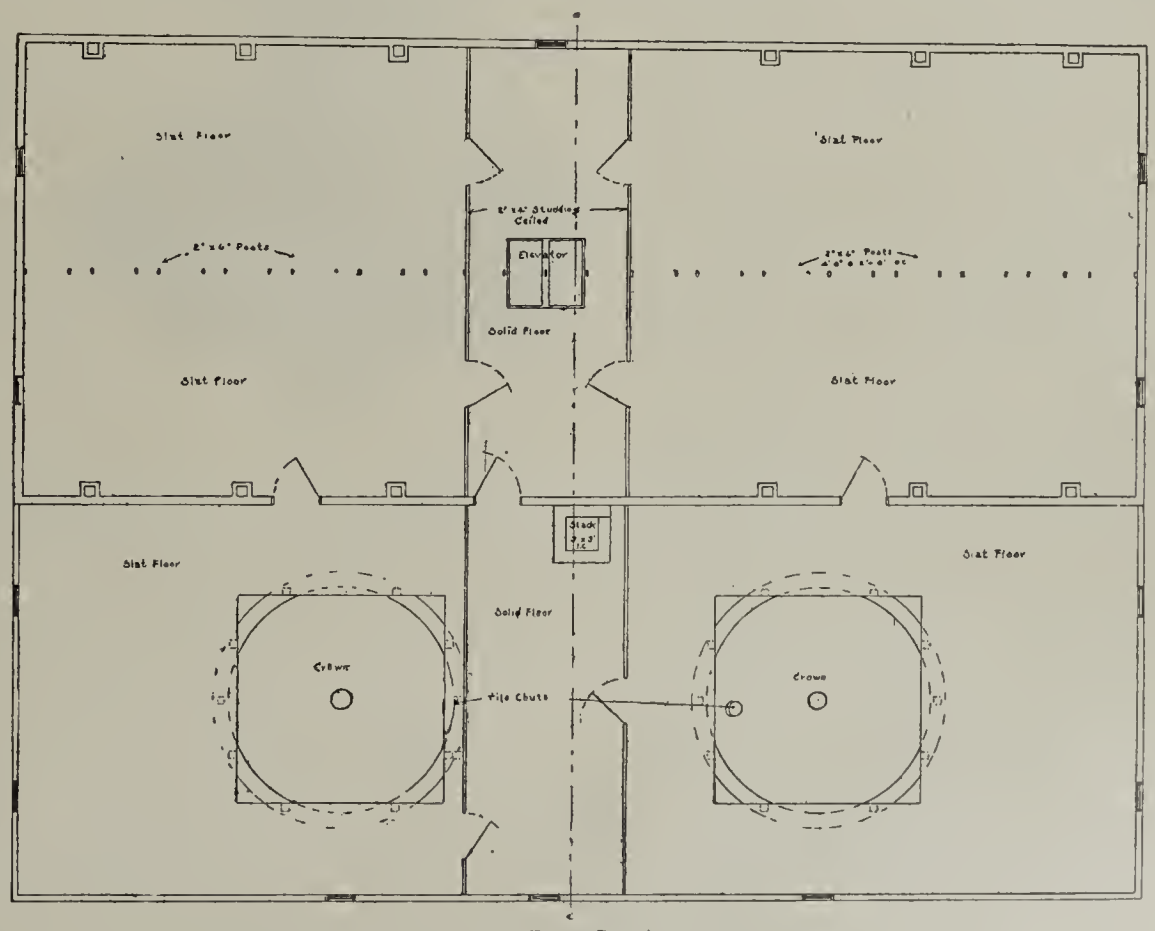
This is rather an expensive system to construct, but it will do the work. These flues all came out of the fires. At the top of this series of flues was a skewback and arch over the furnace the full length of the width of the dryer. The arch was low enough so that the same earth covered the arch also. There was no question that we could dry wares with that method. At the other end, furthest from the fire, was a large tunnel, to give plenty of draft, running the full width of the dryer. I would either build a stack in the center or at both ends. I never heard of any one speaking of this kind of a dryer failing except that it took too much heat to heat it up. It is one of the safest dry floors there is. When you build a dry floor to work to perfection you must remember you must put some expense into it. You must expect to use it a great deal and constantly in order to make it profitable. You can turn the hot air from your cooling kiln into this floor as well as not.

Mr. Blaser: The matter of the expense of construction and of fuel are items for consideration. Can you give me an idea of what it will take to heat a building 40x40—how much fuel it will take to dry a kiln of brick under that arrangement?

Mr. Eudaly: I can only tell you comparatively. I had in the same plant a tunnel dryer, built of brick, with an iron car. We could dry brick on the dry floors about as cheaply as in the tunnel, the only difference being that it cost more to handle the wares on the dry floor than in the tunnel.

Mr. Halbeisen: Do you admit any cold air to the dry room to drive off the moisture?

Mr. Eudaly: Well, this building I had was not an air tight building, neither was it a loose building. It was built with boards, running up and down and slated. I always had to open ventilators, sometimes down low, sometimes higher up. Occasionally we had more open, sometimes less. We never made any special arrangement to get air into it. We had to be careful to prevent the air coming in at any one place too much.



SECOND-FLOOR-PLAN

Mr. Blaser: Does it take any more fuel to dry this way than by the process of drying by steam pipes?

Mr. Eudaly: I don't think it takes as much fuel to dry any kind of ware on a dry floor as to run steam pipes under the floor and dry. I never made the comparison; it is just my opinion. To put a network of steam pipes under a dry floor, to dry properly, they should be covered.

President Everal: We have a slat floor.

Mr. Billingsley: If you have a system of steam pipes, and use exhaust steam, where is the cost of the fuel?

Mr. Eudaly: If you have steam pipes, and use exhaust steam and have sufficient to handle your dryer, it isn't much expense—only what back pressure you might have.

Mr. Blaser: You would have to run after night.

Mr. Eudaly: Run the boiler, using live steam after night and exhaust steam in the daytime, and it makes it very economical.

EXPERIENCE AND OBSERVATION OF A CLAYWORKER.

By J. W. Kellough, Cook, Ohio.

For well-nigh a quarter of a century we have been dabbling with clays, first brick, then drain tile. Competition in making the common yard brick, or hand-made, had kept the price of such at a low figure for many years, so that a slight failure in burning placed the balance on the wrong side of the ledger—when a ledger was kept. Still, there was always plenty of brick that the people might require, and parties anxious to contract millions more, in case of a whispered possibility for wanting them. All hard work and sharp competition, but the brickmaker was a stayer, and found ever ready to pile up more brick and larger kilns, studying wherein expenses might be reduced and 50 cents per thousand added to price of brick. This was a stage of the clay industry when it required sand in the craw as well as sand in the molds—$3 to $5 per thousand for brick, 50 cents per thousand for delivering, either in the central or suburb part of the city. Twenty years or more ago the so-called clay industry received an impetus—a real boom. The people of the flat, boggy districts throughout the country became

unanimously convinced that upon the use of common drain tile depended their financial salvation. First, these swampy sections were drained, then the clay knolls, slopes, and even the clay ridges, more or less. This unprecedented demand for burned clay wares stimulated alike the manufacturer of clay machinery as well as all others concerned. It was received by the people of the country as a Klondike or Eldorado.

And the rush was on. Clay plants sprang up like mushrooms, and it was predicted there would be one in every school district. Everybody in the country wanted tile. If a man dreamed of clay machinery he was immediately interviewed or importuned to buy an outfit, consisting of a mill and engine and all the appurtenances, the best in the world.

Apropos to this state of affairs, the Ohio Brick and Tile, or Clayworkers' and Drainage, Association assembled and organized at the capital city. A, B and C were required to respond as the roll was called and asked to give an account of their stewardship, or a detailed report of their doings in clay, most especially pertaining to drain tile. A good deal of sameness prevailed in responses; everything booming, demand increasing; cannot be supplied. Sales of clayworking machinery were made at the asking price. Members of the Association all felt good. The outlook was very encouraging and inviting. A good deal of money was left in and about the city during the Convention. Experiences were exchanged (we must note that), and, later on, entire plants and outfits were exchanged, including capital invested therein. A little incident we now recall, just sixteen years ago, occurred—a mighty freshet in the Ohio river; incessant rains for several days; ice and snow melting along the tributaries of the Ohio. The lightnings flashed and the waters poured, and came down almost equal to a Johnstown flood. The height of the river at Cincinnati was seventy-six feet four inches, twelve feet higher than ever was known.

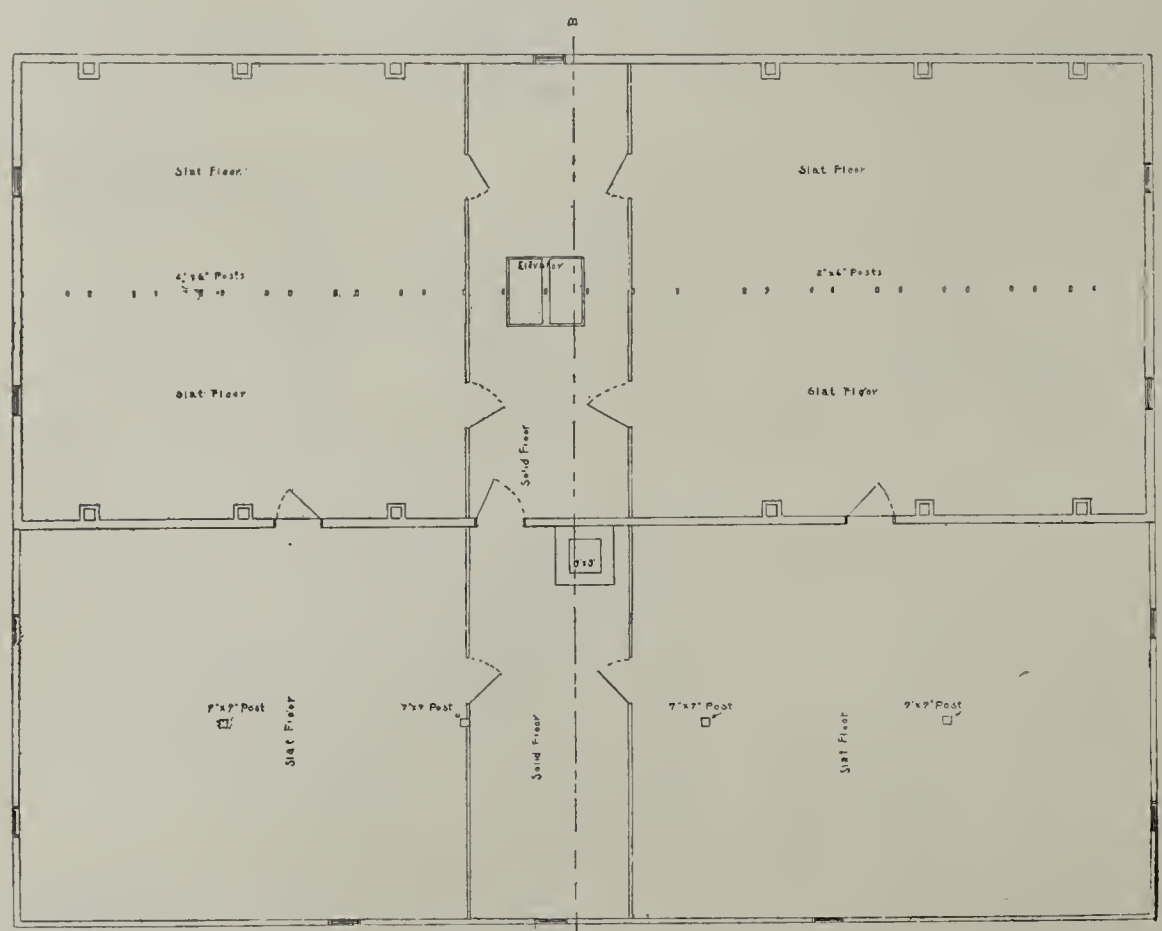
The people of the cities and along the valleys were indignant, attributing the cause of the disastrous flood to the vast amount of drainage done by the people in the flat districts. They refused to be comforted or otherwise convinced, declaring that drainage should not be any further tolerated. But the waters subsided and drainage went rapidly on, and the people have incurred the greatest blessing as a result of drainage than from any other source, we would venture to say, during the past six thousand years. Drainage has not only been a means of preserving and restoring health, but has made cheaper bread to citizenship generally. Two good blades of grass grow now where but one wiry, pungent, rancid, sour weed grew before.

Now, these benefits from drainage are not doing the farmers any more good than the balance of you. We get more and better products and the people get better and cheaper foods. Drainage, as a means of promoting and preserving health, has exceeded any sanitary arrangements or institutions that ever existed, unless instances of all other curative means employed and drainage were combined.

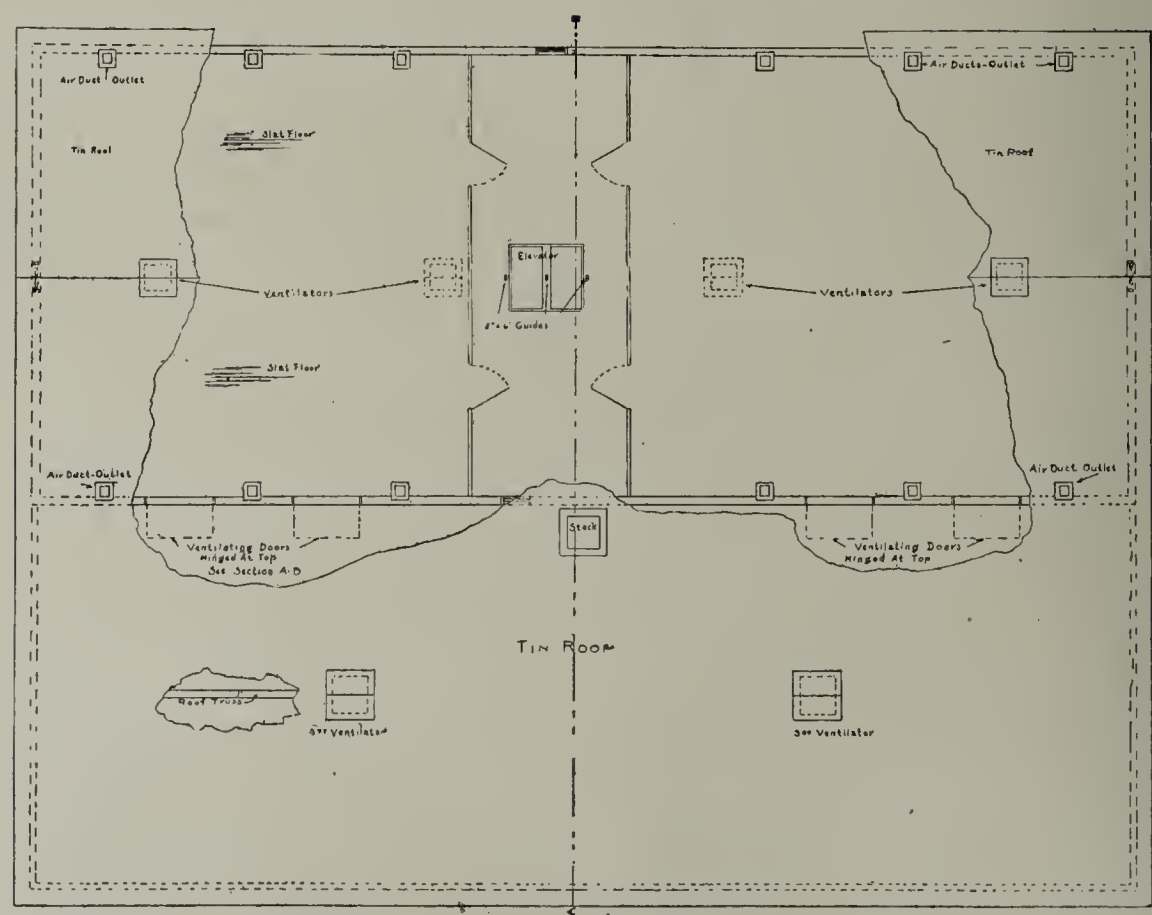
The country is to a very great extent freed from ague, malaria and other obstinate maladies of earlier days. Chills and fevers and other miasmatic plagues are scarcely heard of any more. The productiveness of the soil has in some instances been doubled and trebled. Measurably a safeguard against floods, drouth and frost (but not against fly; we can't head him off—not yet). We might go on and on enumerating the good things and the fat things brought by means of drainage. Suffice to say that the frogs of other years, that made night hideous with their croakings, have been compelled to surrender their possessions to the American flag, so to speak—as is usual in any conflict with American people. The enemy is doomed.

But to return to our experience and observations among clayworkers. A dozen years ago how sanguine they were! They then could afford porterhouse steak and all the good things and fat things of the land. Four-inch tile, eighteen years ago, were selling at 40 cents per rod, ten-inch at $1.50 per rod. Farmers couldn't get as many as they wanted then. Since then, or six or eight years ago, the price went off one-half, and, some years, could not be sold at a half off. Old horses, skeleton cattle and diseased sheep were offered in payment for tile, or any other unmerchantable property was offered for tile that stood accumulated on the yard, quietly and undisturbed, affording a resting place for the owls, that hooted and screeched with fully as much music as the departed frogs.

During all these years of depression, when tileyards were filled (like some manufacturing apartments, from cellar



THIRD-FLOOR-PLAN



FOURTH-FLOOR-AND-ROOF-PLAN

to dome, of overproduction) with all sizes, from three to twelve-inch, and sometimes larger, including brick and hollow building blocks—'twas then the clayworker felt humiliated, felt reduced to the ranks. Despondency and melancholy set in, but no suicidal cases were heard of, although financial wrecks were common, some retiring to the ditches or breastworks, often with the help of the sheriff. Our German friend had long ago remarked, "Nix, all goal vas glens." One clayworker of our community, in the midst of the financial depression, became mentally off—dementia—was adjudged insane and sent to the asylum. Another was a case of elopement—ran away with another man's wife. His friends, however, claimed that he did it to avoid the disgrace of attending his financial reverses. To-day drain tile go begging for a market, too much so. Recently we attended a county ditch sale, at which place quite a lot of tile were required. Not less than twelve seemingly hungry tile men were present, some coming a distance of seventy-five miles. If there was a dollar in it they wanted it. Some bids were made, but, as the assessments were low, it was thought better to enter into some kind of a combination and divide the job, which was accordingly done. Owing to the fact of this sharp competition and reduction in prices, the farm plants are calculating ere long to discontinue. Many of them were erected to save distance in hauling tile years ago.

We have always carried on our farm operation in connection with the clay work, using some of the employes of the tile works occasionally at farm work, but for a number of years last past we have put out not more than one-third of clay wares that our capacity could afford. For this and other reasons our machinery is for sale or trade, consisting of one of the large Ohio mills, a thirty-horse-power engine, etc., about as good as new.

Now, to-day we are here for mutual benefits and a good, pleasant time. It is our prerogative to always be learning something. We can do it if we keep awake and make a diligent effort. Clay wares are destined to be used for all time to come. They have a history from the earlier ages of the earth that commends them to not only contractors and builders, but to all people. It is possible to make them unsurpassed for endurance by even stone or granite. Nothing has a history so commendable as brick. To make the best of clay wares we have learned that, in the outset, the clay should be thoroughly puddled, tamped and tempered, and not used direct from the bank to the mill. The process of proper burning is well known to clayworkers. The degree of dark red color, without warping, is the ultimatum. The cherry red or metallic ring is usually conceded sufficient for tile. The clay industry, during the past twenty years, suffered much inconvenience, delay and expense because of defective machinery, not sufficiently strong. This, combined with inexperience, was frequently the cause of failure. All these defects have been greatly remedied. We note the improvement all along the line and the many encouraging features, and we feel glad we are here to-day. (Applause.)

The Chair: We have had a very excellent paper from Mr. Kellough, and he has touched on many sides of the question. I would like to hear some response. Are there any questions you would ike to ask Mr. Kellough? If not we will pass to the next, "Hollow Blocks," to be presented by E. Biglow, New London, O.:

—Hollow Blocks.—

Mr. Biglow: Mr. President and Gentlemen—I did not see that the Secretary had placed my name on the programme until it was too late to prepare a paper, so I will make a short talk on the subject of "Hollow Blocks."

The first topic would be the clay of which to make them. It should be well tempered and in good condition and thoroughly pugged, because hollow block is more difficult to make than drain tile. If it is not well tempered, and you attempt to make them out of lumpy clay, you will have trouble. We are making 4x8x12 and 4x6x12.

Drying is another quite important feature. Where you have slat floors

J. W. Kellough, Cook, Ohio.

they will dry best. You should set them the longest way with the openings in the floor. If they are set the other way you are liable to have trouble with checking, if they dry too fast. Loss in checking is quite a serious one. Be careful not to dry too rapidly at first. Let them get set.

In setting in the kiln we usually set four or five tiers high on top of tile. We usually set crosswise, two in a block; then across the other way, and so on to the top of the kiln. Mr. Everal sets edgeways, as brick. Some clays will stand that and some will not.

They must be handled carefully, as they chip and get damaged easier than drain tile.

As to burning, it takes longer to burn them than drain tile, because you have a much heavier body of clay to heat. It requires much more time to heat and get a good color.

As to their uses, they are almost innumerable. There are new uses coming up every day. All kinds of buildings are being constructed of them. They are coming into use—different sized blocks—in buildings built of fine faced brick, lining the walls up with hollow blocks 2x4x8 or larger. Then hollow blocks can be used for partition walls. It saves lath and plaster. It takes less plaster, and makes a more solid job. Most of the buildings are regular fire traps, and the use of hollow blocks will render them more safe.

As to laying the blocks in the wall, this is quite an important subject. They should be laid carefully, with not too heavy joints, and with good mortar, with plenty of good cement in it. As to the amount of pressure it will stand, it is surprising the amount of weight it takes to crush the blocks. I had a test made a few years ago, on a block 4x8x12, three-quarters of an inch shell, partition in center half inch, and it took over eighty tons to crush it. A block of the same size, burned near to the same hardness, seven-eighths of an inch thick, took 113 tons to crush it.

In first introducing the blocks one will find much to work against. There are always people who will say it will not stand, that it will crush, but you can see by the test above given that there is no danger in that direction. It is almost impossible to crush them. It would be perfectly safe to build a chimney 100 feet high out of hollow blocks.

That is all I have to saw now, but, if any have any questions to ask, I will be pleased to answer as far as I am able.

The Chair: I have a question to ask Mr. Biglow. He speaks of it being a good plan to use cement in the lime mortar to lay hollow blocks—for what reason?

Mr. Biglow: For the reason that lime mortar will not stand the moisture near the ground. It may do all right up higher. I have hollow block that was laid about thirteen years ago, for which the mortar was mixed in the proportion of three shovels full of lime mortar to one of cement. Where the frost would have the greatest action on it, near the ground, it is perfectly good.

The Chair: Another question right along that line: Have you had any trouble in hollow brick walls with the mortar joints loosening the plaster or paper on the inside, and will cement in the mortar prohibit the water entering?

Mr. Biglow: I could not say. I have not had any experience of that kind.

Mr. Darnell: Mr. President, that is what the cement is used for—to exclude the water. Never but one spot ever appeared on my residence, and I lived in it five years. There were no flashing tins put next to the porch, and a spot of water came through at the corner of the house. I put in the flashing tin, and never had it since. I have one house built of hollow block, of fifteen rooms, all papered, and there has never been any trouble about that. I will say that I use cement in all my mortar. You can't make a good mortar out of lime and sand. I don't use more than a couple or three barrels on a house. There are other reasons why cement should be used: In laying rock-faced brick, the mortar dries about as quick as it falls, and, when cement is used in it and any falls on the brick, it won't stick to the brick

and stain it. If it does lodge on the brick it is easily knocked off. I have a short paper on "Hollow Block vs. Frame Houses," which comes later, and, if I keep on talking, I will have nothing to say.

The Chair: Has any gentleman present had any experience with water following the mortar joint in the superstructure?

Mr. Kellough: I have had some ten or twelve years' experience in the manufacture and use of hollow block. The first most obstinate objection to them came from the brickmasons. Their complaint was that in laying the blocks they were obliged to lay down the trowel to pick up the block, and they didn't like to do it. They did work a great deal against the use of blocks, because they thought in some way it would injure their trade, as it was claimed that anybody with a little practice and discretion could build their own milk houses and such buildings out of hollow block. But the prettiest schoolhouse in our district was built of hollow block. They are of a beautiful cherry red, slightly tinged dark. We have never given any attention to the use of cement in the mortar, but I think it is a good idea. If, however, the lime is properly handled and used with coarse, flinty sand and air-slacked lime, the mortar joints will hold much better, almost equal to the brick themselves. We have used a good many in walling wells, building milk houses, smoke houses, using them in the floors, etc.

Mr. Blaser: About the moisture pentrating the wall: I was talking a few days ago with a mason, who took the position that the blocks should be made 4x4, and not double. I do not think the man himself had had much experience in laying up the blocks; but there is a place in the country where they make them a foot long and four inches square. They use a wire in some way, so as to hold the wall together. He claims if you leave a hollow space between the two bricks in the wall there will be no moisture penetrate to the inside of the house. He claims that in cellar walls the frost will pentrate the hollow blocks made by the sewer pipe people, and the reason he gives is that the wall is perfectly solid, and I believe it will do it. He built a house a few years ago, leaving a space all around, and he says that no frost ever penetrated his cellar. If that is true of the foundation, I think it would be true of the superstructure.

Mr. Wilson: I ask those who know whether it is best to spread mortar all over the brick or block as you build up the wall, or whether to put the mortar on in two separate strings and put the other block on—whether that is better than to make it solid. I have observed in laying block myself that if it was necessary to move a brick after it was laid on the mortar, it was impossible to properly bed that block again. Of course the weight of the other courses on top of it will hold it in place, but wouldn't that make a weak joint through which the moisture might penetrate? If any water gets in a wall of this kind, don't you think it is through the crevices of a broken mortar joint?

Mr. Biglow: I think it is better to lay two strings of mortar along each edge and leave a space. It helps keep the frost from passing through the mortar joint. As to water working through joints, I think one of the causes to blame for moisture getting through a wall is that the blocks are not burned hard enough. Take hard-burned block and cement mortar, and I don't believe moisture could ever get through.

Mr. Darnell: As far as the mortar joints are concerned, we always lay two strings of mortar. I have one man who does this work for me, and he lays two strings of mortar, and, after he gets a layer laid, he goes back and fills up all spaces.

Mr. Blaser: Isn't it a fact that if you have a solid piece of clay clear through the wall that water will penetrate through there by the force of capillary attraction?

Mr. Darnell: It would only go through one opening. That is the advantage of having two partitions. In the winter, when it is cold on the outside, the house is warm on the inside, and in the summer, when it is warm outside, the house is cool on the inside. I don't have a bit of moisture, summer or winter. I don't know whether I have a warm or cold house, but I used only five tons and a half of soft coal to heat a seven-room house all over with a furnace.

Mr. Biglow: One thing I omitted to emphasize, which may be useful to beginners in this line of manufacture—be careful to get your block hard burned, and don't sell soft-burned blocks to be laid down for foundations.

Mr. Landrum: It strikes me that we as clayworkers know there is quite a difference in clays; that some clays are more porous than others; and, as Mr. Biglow says, in making blocks, if we have a porous clay, and, if you get that block a little bit soft, a little slack burned, and if in laying up the wall the joints are not all well pointed up there will be apt to be trouble with the moisture coming through on the inside. If we have a close, compact, tenacious clay, a close-grained clay, which is properly burned in the block, and use a little cement in the mortar, pointing up the top of the joints well with mortar, I do not think there will be any trouble with moisture on the inside. That is my judgment.

Mr. Halbeisen: We have had considerable difficulty in introducing the hollow blocks in our section of the country. As has been said, the people are afraid of them crushing, not holding up, and fear moisture. Would it be of any advantage to set strips up and down on the inside of the building, and lath and plaster on that, to prevent moisture coming through?

Mr. Biglow: It might prevent it from coming into the rooms, but it would come through the wall.

Mr. Hickson: We find that it pays to use mortar made of clean, sharp sand, lime and cement, and also that it pays to use vitrified building block.

Mr. Darnell: Will the mortar stick to the vitrified block?

Mr. Halbeisen: You might as well use vitrified brick.

Mr. Hickson: In building with hollow block it is more necessary to use a hard material than in the use of brick. Hollow block is more apt to take the water. Of course, the joints should be tight.

Mr. Eudaly: The thought has just occurred to me that difficulties are always found in connection with the new things, and hollow block is a comparatively new material for building purposes. Consequently the people say and believe things about it because it is a new building material. For my own part I cannot see why there is any more danger of moisture getting through a wall made from the right kind of hollow block, laid with the proper kind of mortar and construction, than there is of it going through a brick wall. I have listened to the discussion here this afternoon, and not heard a sufficient reason given by any one why it would go through a hollow block sooner than through a brick wall. If mortar will stick to a vitrified brick, why will it not stick to a vitrified block made from the same clay, burned with the same kind of fuel in the same kind of a kiln, as is the case most anywhere where hollow blocks are made? Many of these problems which seem to be so difficult arise from the fact that we are dealing with a new kind of material. The difficulties are not in the material at all—they are largely in our imagination. I believe, with good, clean, sharp sand, not too coarse, and with fresh lime properly burned, that a mortar can be made that will prevent moisture going through without the cement, if put on properly. Brick walls are built that way, and the moisture does not go through. I don't see why it should go through hollow block walls sooner.

The Chair: It does.

Mr. Eudaly: Will it go through the blocks any more readily than through brick?

The Chair: No, sir; if the block is properly burned it will not penetrate the block.

Mr. Eudaly: Of course, we are talking about the right kind of mortar and construction, in comparison with the right kind of mortar and construction in a brick wall. Will it go through one quicker than the other? Of course, with a poorly made block, poor mortar and poor construction, water will go through. I think, where the water will go through a wall and run down upon the floor, there must be cracks running across the wall.

Mr. Kellough: Of course, as Mr. Eudaly says, this is a new building material, and it must be tested, and, if it will not bear the test, it should be discarded. We have been working on blocks for a good while, with never much trouble of moisture coming through the wall, except in one instance. That, I remember, I found was the fault of the mason, who did not like to use them, and did not use enough good mortar. I am further reminded that about twelve or fifteen years ago, when these brick were talked of here by the machine men, there were objections raised by some, who said the mortar would not stick to a machine-made brick like it would to the old hand-made yard brick. A few years later it was declared that the lime stuck to them better than it did to the old hand-made brick. I had a bank barn foundation of these blocks, with only a nine-inch wall, which held eighty tons of weight, and stood well for eight or ten years. On one occasion I wanted to enlarge a cow stable, and took out a part of the foundation early in the spring, before the frost had gone out of the ground, and I found, while the frost was adhering all along the frost line on the

outside, on the inside it was comparatively dry. No frost had come through as much as the second line, and I cannot see but what these walls of hollow block entirely fill the bill and prevent the frost from penetrating to the inside of the wall. They should be carefully laid with good mortar, and I think they will be all right.

The Chair: I will add a word or two. It does not seem to be fully settled as to how the water gets in, or the remedy to prevent it. I know the water has gone through some of the hollow block walls, and it is not confined to the red hollow block, either. The Canton block, which are well known to be vitrified, or at least glazed, supposed to be burned hard. I have seen walls built with them where the water has gone through, probably not so as to run down over the floor, but in sufficient quantity to loosen the paper and mar the beauty of the wall. I can't conceive that it is the fault of the block because it is not burned sufficiently or of good material. I know of a store building, which we put up some three or four years ago with our block, the side walls of which were constructed twelve inches thick, and no water has found its way through. The south end wall is just the width of the brick—eight inches. I have been in the building a number of times, and you can rake off the plastering in quantities. Every dashing rain from the south comes through. I know that the mortar was made in the ordinary way, of lime and sand, and was sufficiently strong enough of lime to make good mortar. Now, what is the trouble? Of course, if we cannot lay hollow block without the water penetrating it, we have no argument to convince any one of the utility of constructing a hollow block house because of its making a dry wall. Now, we have urged that hollow block makes a dry wall, a cool wall in summer and a warm wall in winter. There was only one solution I could find to the difficulty—that it was possibly in the spreading of the mortar over the entire block as it was laid, and that is why I asked Mr. Biglow the question whether the use of cement would prevent the water following the mortar joint to the inside of the wall. It is my opinion that the difficulty may possibly be overcome by laying two lines of mortar, and I think too, it would be well to use cement in the mortar in laying hollow block in the cellar walls or in the structure above. Our blocks were burned, not to vitrification, but burned to a hard, cherry red, and I know that those blocks will not allow enough water to go through in any rain to cause even a dampness on the inside; and it is in the construction of the wall that we need to guard against this difficulty. I have had only two instances of this trouble, and in all the balance of the walls we have laid there has been no difficulty of this kind. I have a house in Westerville built of hollow block and rock faced. After that was laid, with lime mortar, I had it pointed up with black mortar, which formed a kind of cement over the white mortar. Whether or not the rock face of this block will absorb a little water as the rain dashes against it and in taking up some of the water prevent it entering through the joints, I don't know. The idea advanced here is that a slack-burned block would admit of the water running through and getting on the inside easier or give less resistance than one burned harder. My idea is just the reverse, because, if you take a soft brick, it will absorb a great deal of water. If burned black, almost to vitrification, it will not absorb any water practically. In the latter case it must necessarily go through your mortar if it gets in, but the slack-burned block will take up that moisture of the mortar before it will penetrate inside. I think we can guard against that evil by spreading the mortar in two lines and by using a little cement in the mortar.

Mr. Kellough: Did the water go through the wall which was pointed with the black mortar?

The Chair: No, we had no trouble there. If there is no further discussion desired on the subject of hollow blocks we will take up the programme again. We now have some

—Questions for General Discussion.—

After some discussion of the merits and demerits of hard and soft drain tile, the question was presented by the President, viz., "What is the cause of

J. W. Hoffman, Pleasant Bend, Ohio.

brick and tile crazing?" but, as no one present seemed disposed to offer a solution to the problem, it was passed without serious discussion.

The Chair: We will take up Number 10—"Can tilemakers manufacture roofing tile profitably?"

Mr. Eudaly: Yes.

Mr. Darnell: Sure.

Mr. Biglow: If any members of the convention here would like to see roofing tile manufactured and judge of the matter for themselves, I refer them to Ottawa, this State, near Findlay. There is a factory there in successful operation. They have a very strong, tough clay, a clay which shrinks very little in drying and burning. The only objection to the wares of this company is that it is rather a pale red and looks as if not burned enough, still it is burned hard. I do not think it is much use for tilemakers to try to make roofing tile unless they have a clay which will not shrink much in drying and burning. You need a good clay. If you have a clay which will shrink much in drying and burning you will fail.

The Chair: Is there any tile manufacturer here who is making roofing tile?

Mr. Swift: I made a few roofing tile about twelve years ago, by taking three-inch drain tile and cutting it in two, a little diagonally, wider on one end than the other, and cut out on one end to make the other fit into it. I have my barn covered with them, also a lime house and one of my tenant houses. Since they were put on I have never had to replace one of them and the roofs have never leaked a drop. They made a very good roof and are now just as good as the day they were put on.

The Chair: You say you made them of common three-inch drain tile?

Mr. Swift: Yes, sir.

Mr. Eudaly: How did you hold them on the roof?

Mr. Swift: I put a whole through some of them at the wide end and drove a nail through them in the lower row. Then I put an iron rod across the lower row and tightened it on with bolts to the rafters, and the next row was laid over the edge of this, right against that iron, and so on with the rest.

Mr. Eudaly: Was the iron below the first row?

Mr. Swift: No; right on top of the first row. The iron was a little below the half, then the other laps over the joint. That is all that holds them and they have been there for thirteen years. When snow or ice forms on there they raise up and then go back again.

Mr. Wilson: I would like to have Mr. Biglow tell us what he saw at Ottawa. There does not seem to be any of those gentlemen here and we would like to know something of what he saw there.

Mr. Biglow: Unfortunately, when I was there, it was after they had stopped making. I looked over the works and at least saw enough so that I do not care to undertake the manufacture. In the first place, they started with several men spading over the clay, which was six or seven feet deep, with black soil on top, and the deeper they went the paler it burned in color. As far as I could see, it was free from grit or stone. When I was there they used an old Penfield plunge machine, from which it came out in sheets the right thickness to make the roofing tile and it was cut off in square pieces. They had a press copied after the German presses to press the tile in shape. As to the durability of these dies, a man there who showed me around said the dies would last sometimes half an hour, sometimes half a day and other times longer. They were dried on small pallets, large enough to hold the tile. They did not have much trouble from cracking or getting out of shape in drying. I cannot tell how they set them in the kiln, for the kiln had just finished burning a few days before and was not ready to open yet. In drying, they lay them flat on the racks, close together, to keep from warping. I could not say what the price was. The only objection I had to them was the rather pale color.

Mr. Eudaly: I saw in Kansas City, or just beyond there, where they were manufacturing vitrified street paving brick with large down draft kilns; they made roofing tile and put them right in these kilns. They set the tile right up on edge, one after the other, about, if I remember, in the upper third of the kiln. Brick was set all around the

sides and the center filled with tile, and it was covered with several courses of brick. They seemed to burn very successfully. I saw them taking them out of the kiln and walked through it. If I was running a tile factory and building a house or barn, I would certainly cover it with roofing tile any way.

Mr. Blaser: I believe the time for the common use of roofing tile is not far in the future, and it is only a question whether the tilemakers will now take hold of it, or wait for some big monopolies to take hold and manufacture them. They will be made extensively in this country, and when a thing of this kind comes up, the people of ordinary means will not take it up when they should, but wait until somebody with means comes along and gobbles it up.

Mr. Swift: I think the way to do is to rig up a little room and work this out in the winter time, when small tile men have nothing else to do. When I first started to making tile in the winter time, people thought I was going crazy, and I did not do much the first winter or two, but I have got so now I can make tile a great deal cheaper in the winter than in the bright summer time. I make brick in the summer and tile in the winter. Can get labor cheaper and am fixed so I can dry and burn all right, and am making them cheaper than when I made in the summer. And I think roofing tile could be made a small side business in the winter time in the same way by all tilemakers successfully. The people would use them faster, if they could be readily gotten.

Mr. Weaver announced the fact that there was a bill pending in the Legislature to license all engineers, and requiring all persons owning a boiler of more than 35-horse power to secure the services of a licensed engineer. The smaller boilers, he thought, were really the most dangerous, and that it would work hardship on clayworkers if they would be obliged to hire men with technical education to run their engines.

On motion a committee of three was appointed to meet with the legislative committee during the early part of the evening and express the sentiment of this organization as against such license bill. Messrs. Weaver, Kellough and Fish were later appointed to constitute this committee.

Adjourned.

THIRD SESSION.

Tuesday Evening, Feb. 13, 1900.

The meeting was called to order by President Everal, who announced the following committees:

The Legislative Committee—Messrs. Weaver, Kellough and Fish.

Committee on Nominations—Messrs. Biglow, Fish and Metzer.

Committee on Resolutions—Messrs. Wilson, Blaser and Swinger.

The Chair: We will now proceed with the regular order of the programme, which is an address by Professor Edward Orton, Jr., of Columbus.

Mr. Orton: Mr. President and Gentlemen of the Ohio Tile, Brick and Drainage Association — In reading over the reports of such conventions and associations, I notice that it seems quite the usual thing for speakers to excuse any fancied shortcomings in their efforts to their audience, by explaining their lack of time for preparation, or, better still, blaming the secretary for putting them on the programme, etc. I speak feelingly on this latter point, for I am secretary of one such society myself, and have not yet become fully casehardened to the experience of having my best friends shamelessly attack me before the audience as the cause of their own shortcomings, when a few moments before in private conversation I had rather been led to believe that they regarded me with nothing but kindly friendship. To get even with the world again, I shall use this opportunity to declare that our good friend, Darnell, has imposed upon you by putting my name on the programme for anything nearly so formal as an address. I never delivered but one, and my friends advised me never to repeat the performance. So I only promised friend Darnell to give "an informal talk" on this occasion, and any differences between what he has led you to expect and what I shall give, I hope you will visit upon his head. In truth, the story I shall tell you to-night will be very informal, for a busy day has left me not even leisure to prepare memoranda.

The subject to which I will invite your attention is one of importance to you all, and I trust interesting to you all, and certainly familiar to you all, though you are probably not used to considering it from just the same point of view as that which I am about to advance to you. My subject is

—Chemical Reactions Occurring During the Burning of Claywares.—

By the word "reaction," I mean the chemical operations or processes which the various elements present in our clays undergo in respect to each other during the course of the burning process. In the ordinary chemical parlance of the laboratory, we call this behavior or bearing of one element to another in passing through a given process, a "reaction." Or, more precisely stated, a reaction is a chemical change which two elements are able to effect, one on the other, on coming in contact.

You may think at first, perhaps, that there are no chemical changes occurring in the burning process. That is, it does not appear to most people that the burning of clayware should be considered strictly in the light of a chemical process, or a result brought about by chemical reactions. But it is only when studied from that point of view, as being really a chemical process, that we begin to understand the reasons for the many troubles and unexpected events which all clayworkers encounter in burning their wares. It is true that clay manufacture is more nearly allied to the chemical industries than to those of any other branch of industrial art.

There are many different reactions occurring during the burning process. They may be roughly grouped under three separate divisions. This is, we can cut the burning process into three stages, so to speak, each of which is characterized by a typical reaction which distinguishes the kind of work accomplished in that portion of the burn. The first of these three divisions of the burning process is that in which the water is expelled from the clayware. Chemically, we call that dehydration; but, after all, dehydration only means driving the water off. It is a long name for a very simple process.

The water which a mass of nearly dry clayware contains is present in two principal forms. Sometimes it is possible there may be even a third form present; but always we may say there are two forms of water present in a piece of clayware about to be burned. The first form is that which the clay contains as a residue from the drying process. In making clay plastic, we are compelled to use quite a quantity of water, from fifteen to twenty-five per cent. ordinarily. But in the drying process to which stiff-mud wares are always subjected before burning, this fifteen or twenty-five per cent. dwindles down gradually until normally not more than three per cent. is still in the ware when ready for the kiln. That is, wares which seem perfectly dry will, if carefully tested by drying above the boiling water point of water, and carefully cooling in an air-tight vessel, will be found by actual weighing to contain about three per cent. of water.

Three per cent. of water in a clay is not evident to our senses. The clay seems dry. In fact, in some experiments which we made at the University last year, we found that eight per cent. of water added to a clay made comparatively little impression of dampness upon it. We were experimenting at the time in the manufacture of dry pressed brick, using with each clay two different water contents, viz., eight and twelve per cent. We found that eight per cent. of water was too little for good dry pressing, and at twelve per cent. it was just nicely dampened; you would not think of it as at all too damp to work well. So you can well believe that three per cent. of water may be found in clay wares which are apparently quite dry. There is a peculiar quality of clay, which is not confined to clay alone, but is common to many substances. That is the quality of being able to absorb moisture from the atmosphere. If we run clay through a drier at a high temperature and remove all the water, we will find that on exposure to cool air again it rapidly absorbs moisture from the atmosphere again, generally up to about three per cent. This water which the clay is able to take up from the air is called hydroscopic water and it constitutes the second form of water on whose presence we may always count. Since clay is able to take this water from the atmosphere, therefore it is not of any special advantage to make the ware absolutely dry before going into the kiln, for if the burning does not begin at once when the drying leaves off, the reabsorbed water will require a second expulsion in the beginning of the burning process.

When the dehydration process begins, the first water to be removed from the clayware is this free water, left over by the drying process or reabsorbed by the clay after drying. There is no difficulty in the removal of this water; it merely requires that the clayware shall be heated to about the boiling point of water, with enough air circulating around the ware to take up the moisture in vapor form and transport it out through the stack. The removal, therefore, of this part of the water is not a difficult process at all, and only offers two perils to the clayware in the process of burning.

The first comes from driving that water off too fast—raising the wares to a point at which it is converted into steam while still existing in the pores of the claywares. In that case we have the phenomenon of "popping," which I understand is not an infrequent cause of a good deal of damage among drain tile makers, especially to people making relatively thick walled pipe.

I have seen quite a little of the fruits of this fault myself, in visiting sewer pipe and drain tile yards in different parts of

the State, and I notice it is generally shown on thick sections, or large pieces; because these thick sections retain the water further from the surface. They are also apt to retain a little more water, and more liable to be damp when they enter the kiln. The process of heating up when done slowly enough to be safe for the average ware in the kiln is apt to be a little too fast for these thick pieces, and therefore spalls of clay will be split off.

There is also another difficulty which comes in at this point, due to the condensation of the water which may be expelled from one part of the clayware in the kiln and condensed again in another part. That generally happens as a result of the same trouble that causes "popping" of the pipe, viz., hurrying too fast in the early stages. Suppose you have one hundred tons of clayware in the form of pipe packed in the kiln. There are probably three tons of water in the kiln also in this ware. If you bring up the heat too rapidly, the moisture in the first portions of ware being driven out by the heat begins to move ahead in the direction of the draft of the kiln. As these pass onward they constantly become cooled off by contact with the ware further on in the kiln. The tendency, therefore, is for them to get to a point, before leaving the kiln, at which water vapor is condensed on the surface of the ware. There are too good reasons why this condensation or deposit of dew should not be allowed to happen. First, if enough water is allowed to condense on the ware in the lower part of the kiln, it becomes soft and unable to carry the load of the superimposed ware, and therefore we have a collapse. Nowadays, we seldom sweat a kiln so badly as to cause the ware to tumble down, but such things may very readily happen if the three per cent. of water is too hastily expelled.

The second and commoner difficulty is that which comes from the change in color, or scumming of the drain pipes themselves. This happens because the kiln gases, especially where coal is used, always contain a certain amount of sulphur. The clay itself frequently contains it, the coal practically always contains it, the water used in tempering generally contains it. In the burning of the fuel, and the heating of the clay, certain compounds of sulphur are set free in the gaseous form. These combine with the dew deposited on the clayware, making it acid or sour to the taste, and able to take into solution lime salts, which were not soluble in pure water alone. These lime salts, which were in a harmless condition in the original clay perhaps, now form a soluble substance, and as the heat gradually progresses onward and drives the water out, they are carried to the surface and left there as a white scum or efflorescence. This is the second defect which arises from the driving out of the hydroscopic water too rapidly.

You will be surprised, perhaps, to know how high a temperature is required to get rid of the free water in clay. It requires 250 degrees F. or nearly that before all of it gets out, or, at least, the temperature of the kiln, especially that of the smoke and air traveling through the kiln, does get to that point before the last of the free water is driven out. That last statement is true; the first statement, that it requires this heat to get it out, is not true exacly. If we could go at it more gently, we could get it out without this high temperature; but, as a matter of fact, in ordinary work the temperature does rise to 250 or 300 F. before the last of the water is expelled from the kiln.

I said in the beginning of this talk that the water was found in two conditions, and I have so far dealt only with one. This first one was free water which was left in the ware as a residue from the tempering process, or which was absorbed from the atmosphere after drying and before burning. The next question is what other water is present.

When you investigate a clay by chemical analysis, one of the first things you learn is that it is a compound in which water is an integral part; that is, a part which cannot be divorced from the clay mass and still leave it a clay. A pure clay contains about fourteen per cent. of water. If we heat it to such a point that the water is expelled, the mass loses the sensible characteristics of clay. It is no longer plastic, it no longer can be moulded into shape; therefore, it is useless for most of the purposes on which we rely in handling clays. So we may say that water is an essential part of clay.

Now, this water, which is an essential part of clay, is not like this we have been hitherto discussing. It is present in a uniform, not a variable, quantity. That is to say, all real clay—the plastic part of clay—contains a practically uniform per cent. of water. Theoretically, it should contain a perfectly uniform per cent. of water, but the amount of sand and other materials which do not contain any water and which are mixed with it, make the quantity of

Prof. Edward Eston, Jr., Columbus, Ohio.

this kind of water fluctuate from fourteen down to only two or three per cent. If pure clay carries fourteen per cent. of water, and we mix it half and half with sand which contains no water the mixture would contain seven per cent. of water. In fact, the ordinary clays, such as most of you are accustomed to work, contain only seven per cent. of water in combined form. The question is how to get ride of this water. It is all done in the burning process clearly enough, but the interesting point is, at what part. A great many clayworkers have been believing that this water was expelled at a temperature slightly above the boiling point; when the kiln gases passing from the stack are so hot as to burn the hand, many have thought that certainly all was over with the water for that kiln. But that is not a fact. It has been shown by scientists a long time ago that the combined water is expelled from a clay only at temperatures just approaching redness, or above.

To show how we know this fact, I will tell you of a simple experiment which some students at the University make every year. Nearly every class does it in order to fix the facts in their minds more firmly. They make up a quantity of clay, generally taking pure kaolin, which contains fourteen per cent. of water, and make little briquets three inches long by one inch wide by one-half inch thick, which they mark with numbers one to fifty. They are put in an oven and dried until every particle of moisture has been driven out at a temperature well above boiling point of water. Then they are put into an air-tight box and kept there until cold. They are then taken out, one at a time, and weighed on a fine balance and put back in the box. When all are weighed, a chart is made showing the weight of each briquet; they are taken out and put in the kiln. They are made with little holes in one end of them turned toward the outside of the muffle, so that the students can reach in with a wire and pull the briquets out one at a time. The thermo-couple of the pyrometer is then put in the midst of the pile of briquets, so that whatever temperature the thermo-couple shows, we know that temperature must exist in and around the mass of bricks. We then begin to raise the temperature very steadily and slowly and as the temperature crawls up, hour after hour, we take from the kiln, at even twenty-five degrees, two briquets. They are clapped quickly into one of the air-tight cans and when cool are weighed and it is determined how much less they weigh than they did before. When all of the fifty briquets have been drawn out, cooled and weighed, we then plot a curve showing the rates of loss of the briquets drawn at each temperature. We have found this: That the briquets do not change in weight appreciably until the temperature gets about 550 degrees C., or about a thousand degress F. They have been going along, weighing practically the same for hour after hour, while the temperature gets hotter and hotter, until all at once, at about 550 degrees C., or 1,000 degrees F., we commence to see a loss. Then we commence to take them out faster, at shorter intervals, and we find that between each pair we draw the losses of water will be very great indeed. Between 550 degrees and 700 degress about 85 or 90 per cent. of all the water s expelled. At 550 degrees the water begins to go and at 700 degrees C, or about 1,200 F., the last of the water, or 85 per cent. of the water will have been expelled, and the temperature will be a red heat which can be seen in daylight, but not a bright or cherry red heat.

Now, then, the important part of this is that we have been imagining for many years past that the water was all out of the kiln long before this red heat condition was reached; and, as a matter of fact, water is still hanging on there until your ware is red hot, generally until it is a red heat clear to the bottom of the kiln.

Now, then, the question arises, what is the effect of driving out this water at that stage? Does it affect the condition of the clayware? Does it make it more porous? Does it cause it to swell or shrink? In regard to that, I must say that it has been a somewhat disputed point among scientists but that the truth is gradually becoming known.

Of course, we know that driving it out at the right speed produces the claywares with which we are all best acquainted. But the question is, what is the effect when it is driven out at a wrong speed, too fast or too slow. It is doubtful if we can go too slow, but we all know we can go too fast.

There was a time, and that only a few short years ago, when there were a good many people, myself among them, who held that the water remaining in the clay-

ware at this temperature of red heat was able to cause the swelling or puffing up of claywares which some, and perhaps all, of you have seen. But of recent years the matter has become clearer to most who formerly held that view. I no longer believe that the water itself is ever the actual agent which causes the clayware to blacken in the center, or to swell up and become spongy.

I think few who are familiar with swelled or bloated brick now think that water itself is the gas which causes that ware to swell up; but we are pretty nearly certain that the delay in driving the water out of the ware, is a co-operative cause, which does produce it by delaying the second stage of the burning process.

Reviewing for a moment the work accomplished in this dehydration stage, we see that there are two kinds of water in clays, free and combined. The free water may be added in tempering or may be absorbed from the atmosphere. That is expelled at a low temperature, little above the boiling point of water. Combined water is an integral part of the clay and when driven out, the clayware ceases to have placticity and other characteristics which mark it as clay; and this is only expelled from the clay after the temperature passes a visible redness.

The effects of the improper expulsion of the first or free water is "popping." The effects of improper expulsion of the second or combined water is not visible in itself, but is believed to be a secondary or contributory cause of the worst defects met in firing—swelling or bloating or black cores.

Now for the second stage. This second stage I call the Oxidation period. Perhaps that may be a somewhat obscure term, or one difficult to thoroughly explain, but I do not know any other word to give which will exactly characterize the oxidation period. I will begin by illustrating a bad case.

Suppose you take a clay like the Huron shale we have here in Columbus. This black shale is an ordinary clay, as far as analysis goes. It does not differ much from other clays in the State, many of which are worked widely for making excellent claywares. But it does contain, in addition to the other ingredients, five or six per cent. of carbon. This carbon is a fuel, just as the carbon of coal is a fuel; it probably comes from very similar sources to coal, but is so disseminated through the mass that, while the clay will not burn itself, when it is heated in a kiln, it does undergo combustion and gives out quite a little heat of itself. A clay like that, which contains a quantity of iron, quite a large quantity of sulphur, and five or six per cent. of carbon, forms a difficult clay to burn satisfactorily. I think all who have tried to burn that clay have found that out. I have visited three or four plants that are working it, and I have not visited one which has not gone through its "baptism of fire" before they learned how.

The difficulty comes from the fact that it is in what we may call a "reduced condition." That is, its iron is in the form of the lower oxide of iron. There are two oxides of iron commonly found in clay, which for convenience we call the "upper" and the "lower." The upper is the one which colors the clay red. It is the oxide with which you are all best acquainted. It is the one which you desire to produce in your wares, and when your wares contain this upper oxide of iron you have a good color, as well as a good structural condition, strength, and so on. The lower ovide tends to turn the wares black; tends to make them fuse about 200 degrees earlier than otherwise. It tends also to give off gases while in the fusing process.

Therefore, if your clayware is brought to the point where fusion can possibly begin to take place, and the clayware contains iron, and that iron is in the form of the lower, your ware may turn black, or may begin to fuse when it ought to stand up; and it may swell up and become full of bubbles and gas vescicles where it ought to be sound and solid.

Now, as far as claywares are concerned, the process we call "reduction" means the changing of the upper oxide of iron to the lower form, and we call "oxidation," the changing from the lower oxide of iron to the upper form. The black shales, like the Huron shale, contain the iron in the beginning in the lower form. It is our business, if we expect to make good wares from this clay, to oxidize it and bring it to the upper form, so the ware will be red in color and strong and smooth. If we do not properly perform that oxidation, our wares will be black, unsightly and valueless. Therefore, the burning must be so conducted that this ovidation will take place and the lower oxide be converted into the upper form.

I think I have perhaps made it somewhat clear as to what is meant by the oxidation will take place and the lower ing about any clay but the Huron shale, which I held up as a type of poor clay. The question is, is oxidation and reduction important in the burning of other clays? I must say that it does affect most of the old or "fossil" clays. It may affect all or any clay containing oxide of iron. It does not generally affect the alluvial clays which we find along the river valleys, or the glacial clays, which cover the surface of northwestern Ohio. These are already oxidized, and all we have got to do in burning them, is to bring the heat up from the point where they become sufficiently hard without producing reducing conditions in the kiln, which will undo the advantage which these clays naturally possess. But with the shales, or fire clays, or those which have had a long geological history, and which have been buried under ground or water for many centuries—those clays contain their iron generally in the lower form, and it is the province of the burner, therefore, to make this transformation and bring them to that form in which they will make good ware.

A word as to how to produce this oxidation or changing process by which fossil clays become good, red-burning clays. The oxygen of the atmosphere is the source of our supply for oxidation, and the heat of the kiln gases is the agent which makes it active. The clay has been exposed to air at the outside temperature for centuries, but has not oxidized very fast; but we expect to produce in a few hours' burn that which nature has not accomplished in centuries. Although the outside air contains twenty-two per cent. of pure oxygen, it will not combine at the low temperature to make this change in the form of the iron: it requires heat. Therefore, if we bring it to a point of redness, and give it plenty of oxygen, this lower form is speedily converted to the upper form.

The time required is sometimes several hours, sometimes even two or three days. This depends on what else the clays may contain besides iron that is going to oxidize. The reason the Huron shale is so bad to burn is because it contains carbon and sulphur also. Both of these will burn or oxidize as iron does, only both burn to substances which escape from the kiln when oxidized. Carbon goes out as a colorless gas; so does sulphur. The iron merely changes color and becomes more beneficial to the clay, but it does not go out as the others do. The trouble, therefore, comes from this fact: the carbon and sulphur both oxidize more readily than the iron does, and we have got to give time for all three of these substances to become thoroughly oxidized before we go on to the third, or final process. If we do not give time for all it is the iron which is sure to escape oxidation and will therefore go into silicate combination, form a black color, a spongy mass, and ruin the ware. The oxidizing, or middle stage of burning, is most apt to be important in handling the clays of old geological formations, because these clays generally contain their iron, in the lower form and also contain the carbon or sulphur, which, as I have just explained, tends to hinder or delay the usual oxidation in burning.

The all essential point to know about the oxidation process, is that you must give time for this reaction to happen thoroughly. It is one phase of the burning process that you cannot afford to hurry.

As the temperature necessary to support this reaction actively, the temperature at which the last of the water is expelled, on about 1,200 degrees F., will see this reaction beginning, and the temperature at which oxidation is concluded takes place will be anywhere within 300 degrees higher (F.) In Centegrade degrees, the oxidation zone extends from about 700 to 900 degrees. Between those points the temperature of the kiln is coming up from a dull red up to a clear cherry red. Nine hundred and fifty degrees C. is a clear cherry-red heat, at which silver melts. Now, if the oxidizing process be conducted properly, it will all be completed by the time the temperature gets to 950 degrees C. If the kiln has gone too fast and too little time has been spent between 700 degrees and 900 degrees C., there is likely to be some of the lower oxide of iron left in the center of your ware (it being naturally left in those parts farthest from the surface, which the kiln gases reach most slowly and with most difficulty.)

For illustration, I will tell you of one experience we have had with the trial kiln, in the University laboratory. We were generally burning twenty-four hours in this particular series of tests. In burning some briquets which we were making last year, we divided these stages into three different periods of eight hours each. We used eight hours to drive out the water and reach a temperature of 750 degrees C. We took eight hours more to reach a temperature of 950 degrees. We spent eight hours in going 200 degrees in the second stage, whereas we had gone 750 degrees in eight hours in the first stage. We had left eight hours in which to finish the burn, or from 950 to 1,250 degrees C. You may say that does not seem to be a proper distribution of time and temperature, but I may say in reply that we were doing a rather difficult sort of burning, and doing it successfully by this process. We were burning bricks made by the soft mud, stiff mud and dry-press process, and burning them in twenty-four hours, and burning them in a small, up-draft, muffle kiln; to burn as dense a mass of clayware as dry-press brick in so short a time as twenty-four hours, you will admit, requires careful handling. We found we could do it, too, by dividing the periods for the three stages correctly, but any attempt to shorten up on it gave us bad results, especially during the middle period. We could better afford to rob time from either drying or vitrifying than from the oxidizing.

The lesson is, then, to go slow in the center of the burn. From the time your kiln becomes visibly red until it is a cherry red through and through, be sure that you give plenty of time for the oxidizing of the clay, if you are dealing with a clay which requires oxidizing.

Now, for the third stage or the vitrification period. I call the third stage the vitrification stage, but it is really hard to give it a characteristic name, because it is a very complex process. It is not one chemical reaction. The oxidation period is characterized principally by one chemical reaction. The driving out of the water is essentially a simple reaction; but the process of vitrification is very complex. If a ware were perfectly vitrified, it would have no free minerals left in it at the end of the burn. It would all be amalgamated by the heat into one uniform, homogeneous material. If you were to take a chip at different parts of the mass and analyze each, you would get substantially the same material at any part of the mass. By the microscope, or other methods of investigation, you would not be able to discover any difference in the kind of materials here, there or anywhere in the mass.

But of how much clayware can we really say that one part is actually the same as another? Very little. The average vitrified brick, I think, is burned harder than most of you gentlemen are in the habit of burning your drain tile. But lately, I examined some sections cut from a vitrified brick, took thin slivers from a thoroughly hard, vitreous, glazed, brick, ground them down on an emery wheel until they were very thin, then gummed them onto a glass slide with shellac, and ground them down until they were as thin as paper; in fact, there was the merest skin left. It was then put on the stage of the microscope, and, on looking at it with a not very high power glass, we observed that it was not by any manner of means composed of one single homogeneous material. On the contrary, we could distinctly see crystals of this and that mineral still left free, in the midst of the vitreous brick. There is a little apparatus which is used with the microscope, which is called a polarizer, which has the peculiar property of showing whether substances are crystalline or no-crystalline. The red part of the clay was more crystalline, but there were bright specks scattered through this mass, which, on examining with the polarizer I found were still crystalline; and on a closer examination I found they were grains of quartz or sharp sand. So this vitrified brick, which is supposed to represent as hard burning as any class of claywares, does not, by any means, unite completely all the ingredients of which the clay was composed.

Here is a second fact. I recently had occasion to examine the brick dust obtained from the brick-testing rattler, and had occasion to measure the size of the particles of sand from this for a special purpose. On examination of these grains of sand I found there were great quantities of clear, sharp quartz, free from any adhering clay, coming from among the grains of clay from vitrified brick. That shows again that what we call vitrification is anything but a complete combination, and that a clay may be burned quite hard, while its quartz still remains free

and uncombined as when the burning began.

Nevertheless the processes of vitrification do mean the uniting of the ingredients of clay into one substance. They are in general a fusing process by which the identity of each mineral tends to be lost and merged into a new substance. But each mineral has its own characteristic melting point—clay at one point, quartz at a second, lime at a third, feldspar at a fourth, and mica at a fifth, oxide of iron at a sixth. It is a question how these various minerals are going to unite in the process of vitrification, in what order they will melt, in how far one will attack another, and the time in which the entire mass is brought into a state of fusion. So we readily see this last process is a composite one, and one hard to study. Indeed, by merely fireing crude clays, we have to make clays which contain known proportions of this or that mineral and by comparison gradually work out the effect or tendency of each. So far, about all we can do is to get the gross effect by measuring the temperature at which the ware develops its best strength, by saying that for such and such a clay, such a temperature is the proper vitrification point. Each clayworker must do this for his own ware; each of you can tell, practically, where his own ware comes to its best strength. But it is difficult to predict in advance just what is the finishing point for any clay. The best way to tell is by trying.

As to the dangers of the vitrifying process, I may say that the commonest danger is going too far. All are acquainted with that fact, and do not need to be told what will happen if we let the heat get very much too high. Of course, the ingredients of which a clay is composed will have a great influence as to whether going too far will do great or little damage. If there is a great quantity of lime present, the clay will have come to the point at which vitrification begins, very nicely, giving no sign of impending danger; but when it reaches that point, your ware will vitrify very suddenly and go into a mushy condition with the bit too great a temperature. I have seen a limy clay pass from an apparently sound condition into a condition where you could shove a stiff wire through a whole brick, in twenty minutes. Lime assists the process of vitrification if only a little is used, but it is difficult to control. The mineral which works best as a vitrifying agent is the mineral feldspar. This mineral has the property of undergoing the vitrifying process very gently and slowly. It is effective, because as the heat rises it can do its work a little more actively with each increase. A small quantity of feldspar will tie together a good quantity of sand and clay grains; it begins at a low heat and keeps on gradually until a high heat is attained; if you go a little too far when using feldspar as a flux, it tends to make the ware only a little harder instead of ruining it. Therefore, it is one of the best natural fluxes and luckily nature has has made it an ingredient of nearly all clays.

I will take up one other difficulty besides burning too far, which is an aftereffect of the oxidation process. I stated to you that the effects of improper oxidation were very severe, but did not say that the peculiarity of it is in the fact that these effects are not shown during the oxidation period. If we have been too hasty in the oxidizing period and have brought the clay on up to the point where vitrification begins while there is still some of the lower form or iron in the center of the ware, we will find when the vitrification process gets a fair start, the trouble will begin.

The surface of the ware has probably none of the lower oxide of iron, and therefore it is ready to vitrify properly and to form a nice smooth surface; and as the temperature rises this takes place. But there is still locked up, in the inside of that mass, some iron in the lower form which was not properly oxidized as the temperature becomes high enough to produce vitrification. This central portion begins to actively flux and the swelling is caused by the gases from the unoxidized carbonate of iron and other minerals, which begin to try to escape; but as the surface is becoming vitrified, the gases are sealed in. As the temperature rises, the gas expands and takes more room. The ware becomes black in the center, spongy and full of gas bubbles; it looks as if it had been hotter on the inside than outside. I have heard many men ask, "How could my bricks get hotter on the inside than on the outside?" It has not been hotter, and was not quite so hot, probably; but the fact is there is a difference of about 250 degrees in the melting point of the lower and upper oxides of iron, and therefore the temperature, which is just sufficient to burn the properly oxidized outside of the ware a nice red color, is also sufficient to melt the improperly oxidized interior to a black fluid inside. The worst thing about this trouble is that you have no reason to suspect from the appearance of the ware, until you get to the vitrification stage, that the oxidation has been badly done. I was rather surprised to find that fact out. Last year, in the process of experimentation, we did find that the bricks swelled up and puffed out of shape in the last two or three hours of a burn. They were perfectly smooth and true until within three hours of the finisihng of the kiln, and the temperature at which they swelled was within one hundred degrees of the finishing point. We were past the point where the oxidation ought to have been concluded by three hundred degrees or more; but the lower form of iron was sealed up in the center of the bricks, and they showed no sign of it until brought to the critical period; then the damage was done too quickly to stop it.

Now, to bring this somewhat rambling talk to a close, I will simply say that the vitrification process is not the point at which it behooves you to be most careful in clay burning, if your clay consists of shales or fire clays. The point where you want to lavish your greatest care is in getting safely past the middle stage of burning. The probability is that if you get past that safely you can finish your kiln of ware successfully, because it requires rather bad treatment to burn a kiln so that the vitrification point is entirely exceeded and the ware sinks out of shape from an excess of heat. Nine-tenths of the trouble in burning clay wares arises from difficulty in the oxidation period; a little of it is caused by going too far with the heat at the conclusion. (Applause.)

Frank Halbeison, Eslin, Ohio.

The Chair: There do not seem to be any questions forthcoming regarding Professor Orton's remarks, so I will venture to pass to the next.

Mr. Eudaly: I think, Mr. President, we ought not to allow such an admirable address to pass without notice. For my part, I was greatly pleased with this address. I think it is one which will be read with a great deal of interest. It opens up, or hints to use at least, a wonderful field of investigation. We remember that Professor Orton has dealt practically with but one kind of clay, starting with one clay composed practically of one set of elements. Then we know we have such a vast variety of clays and all these varieties must be investigated in order to know their properties and action under fire. It certainly opens up a great field. I believe it will lead us to a better study and understanding of the clay question. There are a great many questions which might be asked Professor Orton along these lines, but as I come next on the programme, we had better not get him started.

This is one of the ablest addresses we have had, and one I have enjoyed as much as any I ever heard. I have given these subjects a great deal of attention and thoroughly appreciated the lecture.

In lieu of his paper announced in the programme, which he had not prepared, Mr. Eudaly announced that if it was acceptable to those present he would conduct a sort of parliament or round table, taking for a subject, "From the clay bank to a comfortable residence with a competency for old age," giving everyone an opportunity to ask questions and state difficulties or experiences. No objections being offered Mr. Eudaly opened the discussion and proved himself a skillful leader by his successful manner of bringing out facts from the experiences of the various members which proved interesting to others, and a pleasant and profitable hour was spent in this manner.

Owing to the lateness of the hour when this talk was finished, the remaining paper on the programme for the evening was postponed until the morning, and the meeting, on motion, adjourned until Wednesday morning.

FOURTH SESSION

Wednesday Morning, Feb. 14, 1900.

President Everal: We have been having a pleasant, social time this morning, but as it is now after the time set for the opening of this session, I will ask you to come to order and we will proceed with the programme. The first in order will be a paper by Mr. Halbeisen, entitled "Success in the Manufacture of Tile."

A SUCCESS IN THE MANUFACTURE OF TILE.

In this paper I have reference to drain tile, and not roofing or flooring tile. My experience has been principally confined to the manufacture of drain tile, with the exception of the past few years, when I have been also making a few perforated block for cellar floors. My treatment of the subject will be confined to the successful manufacture of tile, and not success in a financial way, as in the latter direction I have not met with abundant success. However, I did suggest to our worthy Secretary the necessity of some discussion here regarding the selling of tile, for the purpose, if possible, of enhancing the value of tile in this State. Some may get the idea from this expression that it is my idea that we should meet here and fix prices, or, in an up-to-date way, form a "trust." Be that as it may, I will, just to illustrate the necessity of co-operation among the tile manufacturers, quote some of the prices prevailing at the present time and those prevailing ten or fifteen years ago. Twelve years ago 3-inch tile were selling for $11 per 1,000; to-day they are selling at $7. Twelve years ago, 6-inch tile were selling for $35; to-day for $20 to $22. Twelve years ago, 8-inch were worth $50 to $55; now, $36 to $40—and other sizes in proportion. You will note from the above quotations that the price has fallen off one-third in the past ten or twelve years.

But, you may say, we have better facilities for making them—better machines and better kilns; that the machines we now use will make from a third to one-half more tile than those we used twelve of fifteen years ago, and the kilns will burn with less fuel, less time, and better

results, etc. Yes, we will admit those to be facts; nevertheless, there are other things to be taken into consideration—for instance, the price of fuel. I have seen the time when customers would dicker with you for a day to induce you to take wood to trade for tile at $1.25 to $1.50 per cord, when tile were worth $11 for 3-inch. To-day you must dicker with a man for a week to get his wood for $2 to $2.50 per cord, cash, and then hunt around another week to collect the said cash for tile which you have sold the year before at $7 to $7.50 per 1,000 for 3-inch! Not only that, but to-day your tile must be perfect, must be well burned, nice and straight, smooth inside and out, and perfectly sound—full size in every way. Do not think I am criticising the land-owners for demanding this quality of tile, for I think he is right in this respect; and if a tilemaker cannot make better tile after he has been in the business for several years than he did in the start, he had better quit. We should all aim to advance, making a better article and improving until we have reached the best results possible, for this is the age of progress.

To be sure, a drain tile is a very crude piece of architecture, but I have heard men who were considered wise and successful in their line of business, wonder how the hole was formed in the tile and expressed great surprise when told how simply it was done. These same wise men would inquire how the tile were placed in order to carry off the water from the land, and when informed would seem to doubt the correctness of your statement. I might enumerate many more instances along this line, but all that is necessary to prove the great amount of ignorance existing in regard to the benefiits of tile drainage, is to take up any of our drainage journals or farm periodicals and read the questions asked concerning the matter of drainage. Therefore, you will readily see that we have an unfinished task before us in the enlightenment of those who use our product and in the teaching of those who should use it the many advantages to be derived from an investment in tile drainage.

But I am deviating from my subject, for I notice on our programme there is to be a general discussion on the lame places in the tile business, and a paper regarding the selling of tile, so I will proceed to my subject. In summing up the whole subject, I might say all that is necessary to make a success in the manufacture of tile is to make good tile, burn them well, make them smooth and straight, and, last, but by no means least, to sell them at a profit, and you have the key to the whole business. Yes, but methinks I hear you ask, "Have you anything new to suggest in this line?" That is the idea. Each member who comes here, if he has a difficulty, should state it, and others should assist him in finding a remedy. In that way we will derive the greatest good from our meetings.

I will make a few practical suggestions regarding getting a right start. In the first place, before starting your machinery, see that every bearing has been oiled; see to it that every burr and bolt is tight; look in the crusher and see that there are no monkey wrenches or shovels therein, or perchance one of the men who might have been out late the night before, and being a little sleepy, laid himself down to take a little snooze with the main belt for a pillow—it would be well to wake him up in this case, before starting, for a little forethought in this respect might avoid a damage suit.

Now, the coast being clear, turn on the steam, moderately, starting the machinery very gradually and increasing the speed until the proper speed it attained. Now, waken your men in the pit and tell them to proceed to put clay in the crushers, for the machinery is in motion. But should there be difficulty in getting the clay to pass through the crushers, do not look ot the crusher to locate the difficulty, but examine your clay and see that there are no clods or lumps in it, or too much sand, or possibly some parts too wet. Have your clay well mixed from the bank, and again, when taking it out of the pits, cut it from top to bottom, thus thoroughly mixing it. Also, when filling the pits, spread each load as it is dumped into the pit and sprinkle with sufficient water to moisten the whole mass, so that it may be alike from top to bottom. I make it a point in dry weather to put all the dry lumps in the bottom of the pit where they will be more thoroughly soaked. After you have done your duty in this respect, you will probably not have any trouble with your clay in the crusher. However, this method will not apply to all clays.

Now we have come to the making of the tile. Are you having trouble with the tile warping in drying? If so, the first place to look for the cause is in the die. See that it is perfectly centered, so that the walls of the tile are the same thickness all around. If the trouble is not here, examine the brackets and see that there are no roots or old pieces of belt or ropes which have gotten into the machine and attached themselves to the brackets. If so, remove the obstruction and try again. If no obstruction is found, examine the auger shaft and adjust it so that it is perfectly in the center.

Now, we have the clay well soaked to a homogeneous mass; there is no trouble with it passing through the crushers; it is coming out of the die nice and straight and the column of tile is moving along onto the cutting table. Here, again, there may be trouble. Sometimes your cutting wires get disarranged so that some of the tile are a fourth to one-half inches longer than the others. See that they are properly distanced, for nothing is so trying as to find, when endeavoring to stand the tile upright, that some pieces are long and some short.

Now, we are cutting the tile all alike, and the next thing is handling them. Have a man who is very careful to take them from the table carefully, for the tile are much more easily marred when they first pass from the dies than after they have been standing out a few minutes.

I will pass to the filling of the kiln, for on the matter of drying, I might write a whole paper and not hit the mark. However, I will say that I have met with better success in setting the tile on end than laying on pallets, in the smaller sizes; for unless the clay is worked quite stiff, the tile will likely flatten down. In my experience, it is not best to run the clay through the machine too dry. In the first place, it requires a great deal more power and thus more fuel, not to speak of the extra strain upon the machine, causing breaks and greater wear. I also think tile made of more moist clay is better than where made of stiff clay, and dries through sooner.

We are finally started for the kiln with what we consider a load of dry tile, and we fill the kiln with the same kind of tile, thinking they are all good and dry. Then we start the fires. The first thing we observe after the fires have been going awhile is a cloud of steam coming from the chimneys. Well, we do not think seriously of that, for we expected a certain amount of moisture to pass off from the tile. After firing for several hours, we begin to increase the fires, and, to our surprise, the steam increases. What is the trouble? It is very simple—you have neglected to increase your fires gradually from the start. You must avoid firing too rapidly at a time, when a strong fire might cost you the price of a ton of coal or a cord of wood. Keep your doors open and give the kiln all the draft you can until you see the water smoke is decreasing, then begin to close doors gradually. Now you come to the critical point, where a great amount of trouble is caused from cracking and whitewashing the tile by putting on more fuel and raising the temperature rapidly as soon as the doors are closed. This is a mistake. Having closed the doors, you shut off a large amount draft, consequently your heat does not pass through the kiln as rapidly, so with the same sized fires you increase the heat with sufficient rapidity for three to four hours. Now you may add more fuel and increase the heat until the finishing point. This, again, is a critical point, and difficult to determine. However, if you know how much your clay shrinks in burning, you can tell almost to a certainty just when to stop firing by simply measuring the distance from the top of the kiln to the tile when the burning is begun, and again it begins to settle, and when once it begins to settle measure frequently until you get it down almost where you want it. Then close the kiln perfectly tight and hold it there several hours. Then cool it gradually. First, open the chimneys, then, after five or six hours, admit a little cold air and increase the amount for several hours, after which you may open the doors entirely.

This plan may not be successful with all kilns, but with the more modern kilns where the fire is admitted to all parts of the kiln at one and the same time, both top and bottom, by following the instructions I have given you will surely succeed in burning your tile with a very small per cent. of loss.

In conclusion, I will say that if you want to make a success in the manufacture of tile, you must mix brains with the clay, from the time the clay leaves the bank until it is made into tile and again buried in the ground. (Applause.)

THE SHRINKAGE OF CLAYS.

The Chair: Gentlemen, this paper is before you for discussion.

Secretary Darnell: How are you going to measure to find the shrinkage of a clay that does not shrink in burning?

Mr. Halbeison: It does not apply to clays that do not shrink. The general run of ordinary tile clays do shrink.

Secretary Darnell: How many tilemakers in the hall burn that way—measure the shrinkage? (Several respond.) How much shrinkage do you account for?

Mr. Halbeisen: Our clay will average about two to three inches in ten courses.

Mr. Blaser: I want to say a word as to the manner of handling a clay. It is simply impossible for anyone to tell somebody else how to work his clay—I don't care if he is the most expert burner in the country, if he goes on a yard and begins to handle a clay he is not familiar with, he will have trouble until he gets experience with that clay. We think we handle our clay as well as others do, but I think there is a difference between clays and we cannot lay down a rule for all nor even come near it. Mr. Halbeisen touched on a few points here that I would like to mention, though they may come up this affternoon. He touched very tenderly on the matter of the selling of tile. You will notice that when we come to the question of selling tile, I do not ask my partner about it, for that is my part of the business, and that has been a grievous trouble in that part of the State where I have been operating. I have met many tile men of central and northern Ohio, and it seems to me the great trouble is that we are not honest toward one another. I am very careful, before going into any kind of an arrangement with a competitor, as to the division of work (perhaps I had better not say that very loud, for the attorney general might be around); but I want to say this, that whenever I make a promise, whenever I tell a brother tilemaker that I will do so and so, I do it, and will do it if he gets the job. But I find very frequently (though not so much as it used to be in our part of the country) a man, after agreeing on a certain price, will bid lower through a third person and then stand by and look wise and very much in-

jured when the job goes to this man. At the same time he has arranged to furnish the goods to this farmer after he gets the job. Now, there is one difficulty which stands in the way of us here (for I judge from what I have gathered in conversation that most of us here are dependent upon our own locality for the selling of our wares), that we do not do a wholesale business. We ship a few carloads of tile every year, if we cannot sell them at home, but it pays us better to sell at home, if we can. However, I suppose we have all at times run up against these big concerns who can and do afford to sell their goods for a very low price, and we must meet their prices or fail to sell. I have found this feature very discouraging, and I will not yield to a man simply because he has a little more money than I have; but I would rather sell one carload of tile at a real good round profit than to sell five hundred dollars' worth and lose money or get about cost. Now, we should be honest with each other, and when we divide a job (if we do these things) be fair towards each other, and not try to undermine the other; because every time you do this you injure your own character, and thus you have injured yourself more than you have the other fellow. When one fellow has a little better thing than the others, he puts his hands in his pocket and says, "I'm going to run this to suit myself;" but as we begin to lose money, then we come together and have a better understanding and get a little better money for our ware and no one is injured. I say that competition is not the life of trade, but the death of it! You may not believe that, but it is true, and evidence of the fact is that all the smart business men in this country to-day have formed trusts. Why shouldn't we? Not for the purpose of robbing anybody; not for the purpose of raising the price of our wares to an unreasonable point, but to make a fair profit out of the business. That is legitimate, and there is no set of laws which can be put upon the statute books and enforced to prevent the people from doing that. The insane competition we have met in the tile business demonstrates the truth of my remarks. A few years ago the sewer pipe people struck terror to our souls, but they did us good, too, because up to that time we did not know what it cost us to make a foot of tile. When they began to lay 15-inch tile at eleven dollars a hundred, we began to figure what it cost us and found we could maintain ourselves and sell at a little profit and meet that competition; but it cost us a good deal.

The Chair: Probably if many manufacturers knew the cost of their tile they would not be so anxious to make those sales below cost. The next number on the programme is "How do you Figure the Cost of Ware," and this is a good time to hear expressions upon this topic. Has anybody a system to propose?

—How to Figure the Cost of Ware.—

Mr. Wilson: I can tell you how we know what it costs to make the wares we are manufacturing. We have a method which we think tells what it costs to make every rod of tile we put out. We do not guess, we know. We know what amount the plant is worth; we know how much cash capital we must have as a working capital; we know what the taxes are, and we know what the debts are unpaid; we know how many hands it takes to run the business; we know how many rods of tile we make in a day, and it is the simplest thing in the world to figure up what that costs us to make. We know how much it costs to mold and put it on the dry floor. When we come to put it in the kiln, we know how much it costs to handle, and know how much coal it takes, and we ought to know how much it costs to put it on the yard. I do not see why anyone should raise a question, or say they do not know how much it costs them to make a rod of four-inch tile or a thousand of brick or hollow brick. Take our factory: When I took charge I found out they did not make enough tile before that for the capacity of the works to pay; the expenses were too great. But by keeping account of everything and getting the expenses down, we have reduced that each year since. This year, coal will possibly cost us more and if we do as much shipping as we have been doing our

J. J. W. Billingsley, Indianapolis.

freights are going to cost us more, and the question is how we are going to meet this extra expense.

The Chair: Mr. Wilson, will you itemize what enters into the cost of making tile?

Mr. Wilson: You mean from the time the clay is taken from the bank until it is put on the yard as a finished product? Well, we will commence first with what the plant is worth. What would your money bring you if invested at a fair rate of interest instead of in the plant. You have got your plant paid for, so many thousand dollars. Now, then, you must have a working capital. A man cannot put all his money into a tile plant and make wares unless he has money to pay expenses. Now, then, take the interest on that working capital. Then count every particle of expense—don't leave out anything. Count your time at a salary, at what it is worth. Count everything that pertains to the cost and running of the plant and see what that foots up. Then take the routine we went through a few moments ago and put it all together, and you will be surprised how accurately you have the cost of making your wares. It has been most necessary to know these things in the last seven years on account of close competition. Some of our friends have censured us for selling lower than they could or did, but they do not take into consideration the facilities we have over some other factories. I can't set the price on others' wares, for I do not know what it costs to produce. But we set the price on our own, and add a reasonable amount for profit. We never sold at less than cost, except for culls; and whenever we get a market for a cull, it goes if we do not get cost for it—we want to get it out of the yard. But we base the price on the good ware we get out of the kiln; we never take into consideration the Number two, or cull.

Mr. Landrum: I would like to ask Mr. Wilson what per cent. he figures on wear and tear of machinery and kilns?

Mr. Wilson: Ten per cent.

Mr. Steele: I would like to ask Mr. Wilson what it costs to manufacture a rod of four-inch tile under his present arrangement.

Mr. Wilson: The gentleman must excuse me if I refuse to answer that. As I said a while ago, I cannot set the price on your products because I do not know what it costs to produce it.

Mr. Chadwick: Isn't it a fact that some clays wear out the machinery very much faster than others, so that your 10 per cent. theory might not work at my plant? I do not think 10 per cent. would begin to keep up my machinery.

Mr. Wilson: That point is well taken. Probably yours should be figured higher. Perhaps 10 per cent. would be low for two-thirds of the gentlemen present. I make it 10 per cent.—it is a little fraction under 10 per cent. for us per annum.

Mr. Ramsey: In regard to cost of tile, I had a little experience, possibly about four or five years ago. I was getting at that time a very good price for tile in Toledo, shipping a great many carloads there. I went one day to call on my trade, and learned that the price had been reduced about eight dollars per thousand inside of a week on four-inch tile. I met my friend, my competitor, on the street and took him to task on the matter. I asked him how he could deliver tile in Toledo at the price he had quoted, and inquired if he knew what his tile cost him to manufacture. He said he thought he did, and I said that by the prices he was selling it for, he was either crazy or a fool. He said: "I know this much: I have got my labor paid for and have got my fuel paid for, and what I get out of the tile is clear profit." That is the way he figured it. The consequence is that he has no tile factory at all now, but has a one-horse saw mill and tries to make a living that way. He had built him an eight thousand dollar house and had two farms. His bank is gone, his farms are gone and his house is heavily mortgaged. What I mean to bring out is that so many tilemakers do not know actually what their ware costs them on the yard. This illustration just shows how many of them are doing to-day.

The Chair: We will take up next

Number 17, and will listen to Mr. Fish on the

—"Washing of Clays for Tile and Brick."—

Mr. A. M. Fish, Milan, O.: Mr. Chairman and Gentlemen—I want it distinctly understood that my old friend, our worthy President, is entirely to blame for leading you to believe that you are going to get an intelligent exposition of the theoretical or practical part of clay washing. I have nothing prepared, and will simply endeavor to give you a brief talk on the subject, that of washing clays.

The reason this is not interesting to many is that you are not bothered with limestone pebbles. With us it was a case of "must." As I said yesterday, we have been in the clay business ever since "before the war," and we had exhausted our early good clay and got down to a limestone clay where it was chock full of limestone pebbles and we had to do something. We either had to get insured and let it burn up, or let it decay. We hated to do either, and we began to look about to see what could be done. I hadn't much faith in crushers as a limestone cure. The "crusher" man will tell you he has something that will just fill the bill, but it don't with us. We did use it a little while. We read that clay washing was expensive and not practical; and I will say right here, that unless there are other conditions that are very favorable, don't locate where there is danger of limestone, because it is an extra expense to wash the clay.

Well, we did not know what to do. We heard of these machines used in the potteries where the clay is ground up and squeezed out like cider; and my old father went into Pennsylvania to look at those and saw they would not answer for us. He was coming home discouraged and finally stopped at a little town, Dalton, where he found a man washing clay by the old English method. That was too slow, but we were desperate and we started with that idea. Though we have not a perfect washer, yet I will say that it is not near as expensive a plan as we thought it would be, and I came here to-day to see if I could not learn from somebody else of some little improvement. If it is your desire I will explain our system.

It is run by steam. We built a circular vat about fourteen feet across. In the center we put a shaft, and on top of that have a bevel gear and band wheel. Near the bottom we put a lever and on the end of these levers put a chain and fasten what we call a drag; simply two or three bars, pieces of three by four scantlings with long teeth, fastened together solid; one corner fastened to this center shaft and the other end the chain goes to that lever and is fastened across two or three feet from the bottom. We filled it up with clay when we first started, as we had seen at Dalton, and stirred it with the drags. It was too slow. When the thing was pretty near full we could not go fast enough. One day my son suggested dumping the clay in from the cart. We tried it and since that always dump the clay in from the cart, having the cart arranged so as to let in only about a third at a time., and taking perhaps thirty seconds to do what might perhaps be done instantaneously. You want to wash in the spring of the year when you have plenty of water. You want an inch and a half of water going in all the time with ordinary clays. That way you can wash as fast as you want to, or as fast as two or three men can draw and put in there. Outside of the circular vat we put, on one edge, a box, which ought to be two feet wide and six or eight inches thick, and inside a screen, for ordinary brick or tile, of four meshes to the inch. The slush, when this thing revolves thirty or forty revolutions per minute, at first goes out as fast as it comes in, but it gets too thick unless you have plenty of water. That runs off into the drying place. You want two drying places for it. It can run in a trough to the outside and should spread over plenty of territory. We take off about six inches of earth and make a ridge around about six square rods. You should wash in the spring and let the washed clay lie until the next year, when this may be used and you wash again, running the clay into the second drying place prepared as the other was. This way it weathers and freezes and is in good condition to use.

There are three ways in whch this washer could be increased in capacity. First, put in three or four drags, where we have but two; second, increase speed of running; and third, make it larger. You could have a sixteen or twenty-foot vat or agitator if you wished. It does not take a great deal of power to revolve these drags. Perhaps once a year we clean it out, but sometimes run two years without cleaning.

Mr. Ramsey: Where you are bothered with lime, what color does your ware burn?

Mr. Fish: Our clay burned a medium red; it would not make a first-class color of brick. It is quite a tough, tenacious clay, the best clay we have for making smooth, hard solid tile.

The Chair: You say this clay you wash is kept over until the following spring?

Mr. Fish: Yes, sir.

The Chair: How many tile do you make in a season?

Mr. Fish: Well, we are on the decline of life; we have so much competition and other business that we don't make many—two or three hundred thousand.

The Chair: How many kilns do you burn?

Mr. Fish: Ten or twelve—eight or ten.

The Chair: How large are the kilns?

Mr. Fish: One is twenty and the other is twenty-two.

The Chair: That will give an idea of the amount of ware you calculate to burn from this clay—some ten kilns twenty feet in diameter.

Mr. Fish: We do not wash all our clay. We wash perhaps a quarter of it, where the limestone is. Our top clay is free from limestone. It is sandy, but, by mixing a quarter of this washed clay with it, it makes good ware.

Mr. Henry: Don't people wash clay for the purpose of making it work better, where they have a stubborn clay?

Mr. Fish: I don't doubt that. This clay, when first dug, is hard and tenacious, and it is almost impossible to get it through the rollers; but, let it lay out there after it has been washed once, and it easily soaks. The water goes into it, and it is easily subdued after it has been washed.

Mr. Biglow: Is it the tough, blue clay that you wash?

Mr. Fish: Yes, that is what we wash.

Mr. Biglow: Does it dissolve readily in water?

Mr. Fish: After it is washed it does.

Mr. Biglow: When dug, right from the bank?

Mr. Fish: No; the water will not go into it unless it soaks a long time.

Mr. Biglow: Does it dissolve readily in the washer when dumped in?

Mr. Fish: Not as quickly as your clay or top clay. It is a little harder to subdue.

Mr. Biglow: What horse power does it take to run that washer?

Mr. Fish: A five-horse power engine will run it all right. It does not take much power.

Mr. Darnell: How many pebbles do you have in the clay—many or few?

Mr. Fish: In one sense, a few; but, to look at the ware after it is burned, there would seem to be many; makes the ware look very bad. It is pretty hard to be a Christian sometimes and look at that tile after it is burned.

Following is a paper of Mr. E. P. Diller, Bluffton, O., on "Best Means of Promoting Sales of Tile."

BEST MEANS OF PROMOTING SALES OF TILE.

To the Ohio Tile, Brick and Drainage Association: The solution of this problem is endless. Pages could be written on this subject with but slight results to many. The question, "How to promote sales of tile, etc.," is the vital point with all manufacturers.

It is the solution of this problem as it is with other economical questions that makes the close competition. The manufacturer, like the inventor, labors not from a philanthropic standpoint, but that whch benefits himself. I shall now try to give my points in a brief form, as follows:

No. 1. If you want to be sure to make a sale in the future, always make it a point to hand your customer a tile as a sample of your workmanship and to show your hospitality.

No. 2. Never give away any tile that are not first-class, for other people that are not concerned in it will judge that it is the best that can be secured.

No. 3. Have it well advertised, be sincere in the way of arranging it. Distribute cards advertising your ware, with some kind of a declamation or other nobby thing referring to tile, just so it will be read.

No. 4. Have some tile on hand that you had lying in the mud the previous winter.

No. 5. Be ready to compare your ware with your neighbor's.

No. 6. Never misrepresent.

No. 7. Learn to know your community.

No. 8. Make an exhibit of your work on the fair grounds.

No. 9. Secure good traveling facilities to your plant.

No. 10. Always manufacture enough tile of every size that you may just about come out even at the end of the year.

No. 11. Always see that your customers are waited upon, even if they could load them themselves.

No. 12. Guarantee your tile to endure freezing and brittleness.

No. 13. In a dry season it is well to have an auction sale to start the trade.

No. 14. Aim to have a good tile reputa-

tion as well as to be honest and friendly.

No. 15. Learn to speak well for your business instead of trying to put down your competition.

No. 16. See that your tile hold out in length and diameter.

We might suggest other devices as a means of securing a good sale, but I feel that the vital point is pretty well covered in this paper, as we all know that the greatest attention to details is what brings forth the fruit of progress. (Applause.)

Secretary Darnell: The next on the programme is a paper by Mr. Billingsley, but, as he is absent just now, I will read my paper, entitled

HOLLOW BLOCK VS. FRAME HOUSES.

By Ed F. Darnell.

In preparing a paper on this subject, it will not be my object to give you prices on how cheap a building you can build out of hollow blockes, but I will endeavor to show you the superiority of hollow blocks as a building material over all other material.

It is not necessary for me to go into detail as to the construction of hollow block; there is not a member of this association but what is, or should be, familiar with their manufacture.

The superiority of hollow blocks over frame houses is so great that there is no comparison; a frame house is a constant expense after it is completed, requiring painting every third year if you wish to preserve and keep it in good appearance; a hollow block house that is built out of good, well-burned blocks will last for ages and does not require any paint to preserve it.

The first cost of a hollow block house is not as much as a frame building built of first-class material, painted and finished as a building should be.

Some may ask why a building can be built cheaper of hollow blocks than of any other first-class material. In the first place, when a bricklayer lays one 12-inch hollow block he lays equal to five common brick; the labor on a building constructed of hollow blocks is only about one-half as much as common brick, and no more than frame. These are facts, as I have built both kinds.

A building constructed of one thickness of hollow blocks, that is, a nine-inch wall of hollow blocks makes a more substantial building than a thirteen-inch wall of common brick. The mortar joints are the weak places in any brick wall.

In manufacturing hollow blocks for a building a uniform length should be made. You will need different lengths to fill out, but a block twelve inches long, laid with the joints broken in the center, makes a much better looking building than one hit and miss. In belt courses and water tables the long blocks should be used.

I have been asked as to the dampness of the walls. I have never seen any moisture on a wall built of hollow blocks where they were properly laid and the joints pointed; in fact, I have never had a complaint from a building I have built.

We brickmakers must set the example; we cannot expect others to buy our material if we do not use it ourselves. How many brickmakers live in brick houses? Not one-half of them, and I doubt if one-third. And why? They themselves cannot tell.

If every manufacturer of hollow blocks would build a good up-to-date residence of his own product, it would only be a short time until hollow blocks would be generally used in place of wood in the construction of residences, as they are the coming building material.

I am not here with a patent kiln right to sell, nor do I represent any manufacture of machinery, but I do insist on the drain tile manufacturer to equip their factories for the manufacture of hollow blocks, or they will wake up when it is too late to the fact that they have a competitor in the field. They say that competition is the life of trade. Not so in the tile and brick business; it is the death of it.

There is territory enough for all. We must not be selfish enough to think we can supply all the demand. Hollow blocks are like drain tile—they cannot be shipped any great distance on account of the excessive freight rates. If we could get the rates that the common brickmakers do, then we could afford to ship.

The insurance companies will write insurance on hollow block buildings for two-thirds what they charge for frame buildings. A frame building is a veritable fire-trap. They are the most inflammable building that could be constructed out of the studding and joists are air flues that carry same amount of material. Between the the fire all over the building. Why do people continue to build these inflammable dwellings? Simply because they do not know hollow blocks are cheaper. The public must be educated to any new material, and the sooner we commence, the better off we blockmakers will be.

No brick-layer will oppose hollow blocks. They know that one of the objections to hollow brick is the cost of layng them up. If hollow block houses can be built at a less cost than frame, of course they will take the place of wood in the construction of buildings, and that will give the bricklayer a new field to work.

What person could ask for a finer residence than one built out of rock-faced hollow blocks all of a uniform color? It is a perfect imitation of granite and almost as durable.

A residence built out of hollow blocks

Ed. F. Darnell, Grove City, Ohio.

is frost-proof, fire-proof, warm in winter and cool in summer. What more could man ask? (Applause.)

On the completion of Mr. Darnell's paper a member requested that he should explain his manner of rock-facing the hollow block.

Mr. Darnell: I do not use a roller die, but use a chipping tool as a stonecutter does. Take my clay, and a block from the top and one from the bottom of the kiln, when chipped, are the same shade of color. You will not see any difference. My objection to the roller die is that it is impossible to burn a kiln of brick or of block and have all of the same shade.

Mr. Blaser: Wouldn't the different colors, the different shades we have in our kilns, harmoniously arranged in buildings, give better effect?

Mr. Darnell: Why don't you paint your house that way?

Mr. Wilson: Speaking of the point raised in Mr. Darnell's paper relative to brick and tilemakers advertising their wares by building for themselves, it is well taken. Last fall, when we built a new office, we built it of hollow block, the partition across the center as well as the outside walls. We used no timber except for floor and joists. We sent to Montezuma, Ind., for the roofing tile, which suits me very well, though I could be better suited. But it was not like making it ourselves. I would like to have been able to say that we had made everything used in the building except the lumber. The roofing tile was shipped to us in barrels, and you may imagine what it cost to get it here. The freight cost as much as the tile at the factory, and it made the tile cost us, delivered, about $7.50 a square. It is the lightest tile I have ever seen, and neat in form, but I think it could be improved upon. You will understand now why I was so much interested in the question of the manufacture of roofing tile, after having brought those tile from Indiana at such a heavy expense in freight.

Mr. Henry: Will all brick and tile clays make good hollow blocks?

Mr. Darnell: No.

Mr. Henry: What must be the nature of the clay to make good hollow block?

Mr. Biglow: That is rather a hard question to answer. From my experience it requires a better clay than it does for ordinary drain tile. The difficulty is to get the corners to run square. It is hard to run a tender clay into the corners. A tough, good clay is better. It must be a good, strong clay, well tempered. We do not attempt to make hollow block out of clay not tempered.

Mr. Henry: What is considered the best color?

Mr. Darnell: Red.

Mr. Henry: Most blocks I have seen have been dark.

Mr. Rogers: You say you put two strings of mortar on the edges of the block, and there is no pressure in the center. What, then, is the benefit of that center?

Mr. Weaver: In answer to that question, I tried making a block without a center, and, unless my clay was quite stiff, I would have trouble from the sagging of the center of the block. It keeps it to its shape better.

Mr. Darnell: Regarding the partitions, I know that it makes a better block. As to the air passing into a wall, I do not think the air ought to circulate in any hollow wall. It would make a cold house in winter and a warm one in summer. It is dead air that we have in our refrigerators.

The Chair: How many here make hollow block? (Seventeen responded in the affirmative.) Seventeen tile or brickmakers here also make hollow block.

Mr. Weaver: I intend to do as Mr. Darnell suggests, and build myself a house and barn of hollow block the coming summer, and see if others will follow.

Mr. Biglow: My plan is to have a foundation of rock-faced blocks to the proper height; then use nice raced brick for an outside course, lining it up with hollow block of the proper size on the inside, and make a wall twelve inches thick, putting the plaster right on the hollow block wall. Then build all the partitions in the house, where possible, of thin hollow block; have the partitions about four inches thick. Where there is any support, or even not much support, it is perfectly safe to put in hollow brick

partitions, as long as there are supports under them at the corners.

Mr. Darnell: All the partitions in the Wyandotte building in this city are built that way—about a half-inch wall to a four-inch brick.

An able paper was read by Mr. Billingsley on the subject of "Farm Drainage," but, as the noon hour had arrived, discussion of the same was postponed until the afternoon session, and the meeting adjourned until that time.

FIFTH SESSION.

Wednesday Afternoon, Feb. 14,

President Everal: Gentlemen, you will please come to order. Just before we adjourned we had a very instructive paper on "Farm Drainage," and I promised the Association the privilege of discussing this paper on assembling this afternoon. You were most all here this morning, and, if there are any questions or remarks in regard to the paper, we will be glad to hear them.

—Benefits of Tile Drainage.—

Mr. Weaver: I understood the gentleman to speak of the elements of fertility brought down by the water into the soil. I would like to know what elements are carried from the air into the soil by water as plant food.

Mr. Billingsley: Mr. Chairman, the principal element brought down is nitric acid or nitrogen. That, perhaps, is the most valuable element we can have combined with the soil. In practical experience you know that if you set a tub out under the drip of a house or building, after a long continued dry spell, or any dry spell of any considerable length, the first water which runs into that will be yellow, strong, rather nauseating to the taste. That is the element of fertility to which I referred that so strongly impregnates the water. There are some estimates in regard to the value of of this element to our soils that makes it one of great consideration. If the soils are compact and close, these heavy, dashing rainfalls during the summer run off over the surface, not only carrying off these elements of fertility, not only taking off the fine particles of soil, but the moisture which is so valuable to the mechanical cultivation of the soil. The process of cultivating land runs about this way: We turn over about five or six inches of the soil and cultivate it during the year, and the dashing rains wash it out. Next year we turn it over, and it is washed out on the other side. On millions of acres has this process been going on during the past fifty years. Is it at all wonderful that many fields once productive are not so productive now and most sad in their condition? I can well remember when in the first cultivation of the land, after it was brought into cultivation, that the soil fell away from the plow mellow, arable, and in the best condition for the crops. The same fields now, excepting for one or two days after the soil comes into condition so it can be plowed, clods and requires harrowing and working to make it suitable for the crops. This is the result of the washing year after year. Tile drain makes the soil porous, so that when these waters come they soak right down into the soil, and the water runs away clear in the drains.

Mr. Weaver: The reason I asked the question is that I read a paper before a farmers' association, and a scientific gentleman, one of the State lecturers, was there. I made mention of this element of fertility being brought down in the water, and he said the free nitrogen of the air could not be made available as plant food as brought down by the water. I thought there might be some gentleman here who could answer the question scientifically.

Mr. Halbeisen: In what way does this air enter the soil?

Mr. Billingsley: That is a somewhat difficult question to answer. Possibly a large portion of this may enter through the drains themselves; but there is a continual change of atmosphere on account of the heat which the soil absorbs. The air near the surface becomes warm, expands and rises, and cool air takes its place, and near the surface there is a continual change going on in this way. Besides, you know, when the rainfalls come, the water passes down through the soil, and nature will not allow any vacuums if she can help it, and, when the water falls out through the soil into the drain, the excess of water, the air must follow down to fill these spaces between the particles of soil. In that way we get a circulation of air through the soil.

While on the floor, in this connection, let me remark that the soil on which we walk every day and from which we derive our sustenance is a great laboratory in which is being prepared through heat and cold and under all conditions almost, except when full of water, the plant food necessary to plant growth upon which we live; and a condition of soil which will allow these conditions and chemical combinations to go on in the soil is that which we should procure, if possible, for our cultivated lands.

Mr. Henry: Do you recommend laying the tile at a depth of four or five feet in heavy clay soils?

Mr. Billingsley: Mr. Chairman, there are some soils, or subsoils, rather—clays, if I may use perhaps a more definite term—that if the water line is allowed to rise above the tile in a long-continued rainfall the clay will run together and "puddle," as we call it, and will require perhaps a year and sometimes more to regain its former porosity; and drains are sometimes condemned on account of this. One remedy for this condition, which does not exist everywhere, only in a few localities—one remedy is large tile, tile of sufficient capacity to take the water as it comes to the drain and carry it away and not allow the water line of complete saturation to rise above the tile. If we use tile of sufficient capacity in our drift soils you may have fertility as deep as you will underdrain—and we all value deep soils. You may take our drift soils, frequently to a depth of twenty feet, throw it out on the surface, allow the action of air, frost and sunshine, the weather as it comes and goes, upon those soils and they will become productive. So if you can carry that condition down and make these soils fertile so they will feed our crops, that is the condition we should seek for best soil conditions.

I am a little proud of the fact, Mr. President, that from the beginning of the publication of my journal, I have been an advocate of deep drainage, and I am glad to know that I made no mistake, not only in my own experience, but theoretically and otherwise. I know that some prominent men have advocated shallow drainage, but I still "stand by my guns" for deep drainage; for the greater depth of soil, the greater amount of fertility made available, and the greater width drained by deep drainage as compared with shallow drainage. To illustrate—if you put down two drains 100 feet apart, two feet deep, and that is about as thorough as many men will drain—more so than many have done—the effect of those two lines of tile will only reach two or three rods at the utmost on each side of the drain and the rest of the space is not affected by it at all. Whereas, if you carry it down four feet in the soil or subsoil it will drain the entire space. It will drain the surface near the tile or further away in proportion as you carry the depth down.

Mr. Halbeisen: I would like to persuade our friend, Mr. Billingsley, to change his views a little on deep draining and make it more shallow and add an extra string of tile between there.

Mr. Billingsley: Mr. Chairman—If you can get men of intelligence to fully appreciate the advantages of deep drainage then you will get more thorough drainage than in any other way. The man who lays his tile twenty-four or thirty inches down, only lays it to get rid of wet places and that is all he does.

Mr. Henry: The reason I asked the question is this: As Mr. Billingsley said, I have advocated deep drainage and have always been proud of it. I went, like my friend on my left, out to enlighten the farmers. I reached out into this subject and advocated laying the tile at a depth of four to five and five and a half feet, if they had the fall. I found in that community a very strong opposition, and a man stood on the floor and told me at that farmers' institute that in some fields they had laid drains at different depths, some four feet and some from two to two and a half, and they told me that the shallow drains were the only ones they could see were doing any good in that land. I maintained my own opinion and stuck to it. But those of us who began life on the farm, and as boys perhaps held the plow, remember that in certain places we struck something in the land we were trying to plow into that would hardly let the plowshare to take hold, and I wondered whether or not I was wrong in advocating deep drainage on that kind of soil. This question has been agitating my mind since that day I had the contest with the farmers.

Mr. Billingsley: There are subsoils that are very difficult to drain and if you put the drain down deep they will require the action of the water and of the air a number of years to bring about the full benefits from your money and labor; but it will come in the

course of nature. I have had men frequently to assert that there were certain clays that could not be drained. A man said to me once in a discussion of this kind before a farmers' institute that when the water got into his cellar it wouldn't get out; the cellar would hold it like a jug. I asked him how the water got into his cellar. "Well," he said "it ran through the clay, I reckon." I replied, "If it ran through the clay and you will provide a drain for it to get out, it will drain." If the water will get into the clay it will get out into the drain if you give it an opportunity; but it takes a much longer time for some clays than for others to get the full benefits of the drain.

Now, I would like to say this in this connection: that if I had land where I could not get an outlet sufficiently deep to drain deep, I would drain shallow rather than not drain at all. Then I would increase the number of drains, as my friend, Halbeisen, suggested, so the soil might get an average benefit all over the field on account of the number of drains. There are some soils that are a kind of hard pan and you can only dig them with a pick, and yet from my own observation and from the observation of others who have had experience in underdraining subsoils, it requires five, six or seven years before the full benefits are derived and possibly not then fully. It may require a longer time, but these hard pans that you cannot dig with a pick become as mellow as an ashbank in years, and productive.

Mr. Hickson: You get more corn and better corn by the land being underdrained, it being warmer?

Mr. Billingsley: That is true. It increases the temperature of the soil about eight per cent., eight degrees. It enables you to plow sometimes a week earlier in the season and gives that much longer for crop growth. The soils are not only warmer, but after a heavy rainfall in the summer, when it is desirable as soon as possible to break the crust which may have formed upon the land, you can go into the field a few hours after a rainfall and go to cultivating the land and break the soil up so it will not evaporate so rapidly, do what we call mulching of the soil and in that way hold your rainfall. Right here let me say this: Deep drainage has another advantage in this connection, that is conserving the water as it comes to you in the summer time, in the time of crop growing. If the soil is open and porous to a depth of say three feet, it takes an immense rainfall to make it moist down to the line made open and porous through the soil. You scarcely ever see a rain come in summer and run water from the tile. If you have a large sponge, it will take an immense amount of water to fill your sponge before it will drip. The same is true of the soil. It takes an immense amount of water to fill the soil till the water drops away; it takes so much more water to fill that soil in proportion as the drains are deep or shallow. So if you want to conserve the water which comes in the summer for the benefit of the crops, nothing will do it better than deep drainage.

Mr. Blaser: All this talk will do no good unless you get it before the farmers. You must go to the farmers' institutes and give them that kind of talk, and you will sell more tile and do better work.

The Chair: We would like to continue the discussion of this subject, which is of interest to all of us, but we have a paper next on the programme which we shall be glad to hear, viz., "Practical Achievements of Science Applied to Clayworking," by Mr. A. V. Bleininger, of Columbus, O.

Mr. Bleininger, of the Ohio State University, is with us and will now address you.

Mr. Bleininger presented the following paper:

THE PRACTICAL APPLICATION OF SCIENCE TO CLAYWORKING.

Mr. President and Gentlemen of the Convention:

Having been honored by your esteemed Secretary by a request to prepare a paper for this convention, I was somewhat perplexed as to the subject to be chosen. Large as the number of available topics may be, yet upon occasions like this one feels most seriously the narrow horizon of one's knowledge. For this reason, and also for the fact that I have been hard pressed for time, I decided to take a broad subject, yet one not devoid of interest,

A. V. Bleininger, Columbus, Ohio.

and perhaps at this time more or less appropriate.

At the close of the ninetcenth, or the beginning of the twentieth century, as you may have it, would it not be well to survey the status of our knowledge in regard to facts of the clay industry? To what extent is science ready to help us in our work at this date, or is all the talk of science mere sound of words?

First of all, what is science? It is simply organized and sympathetic knowledge, the logical resule of experience and work. All of us are scientists if we trace in what we do the current of the natural laws and to make our work conform to these laws. There still exists an impression that the scientist is a man whose world is a world of books, and of whose general knowledge is of the most impractical kind. Never was there a more grievous mistake. Modern science is entirely practical, and the scientist is a practical man wherever he may be at work—in the laboratory, the field or the shop. If he is not practical, if he is not willing to work hard, if he is not willing to make sacrifices, if he is not willing to be unselfish, he has no claim to the name of scientist. I know not of a name more nearly corresponding to the ideal of scientist than that of Faraday. This illustrious scholar, whose discoveries astounded the world, was asked to reap the fruits of his work and to acquire great wealth, but he refused to do so, and preferred the enjoyment of his scientific labors to the acquirement of riches. His example stands by no means alone. The pages of history are crowded with names of men who have given their lives to science and the achievement of their work to the world.

But the writer must confine himself to his subject. The topic, "Science Applied to Clayworking," must be restricted rigidly to science in so far as it has a direct bearing upon clayworking. All of us use telephones, telegraphs, electric motors and what not, which involve the practical application of science, and to include them in this paper would be to swell it to an overwhelming task. For this reason I wish to restrict the subject to those applications of science which are primarily connected with clayworking.

Let us first start with the all-important topic of clays, whose infinite variety causes the condition of clayworking to differ so much. The question to be asked first is, what means has science provided for determining the peculiarities of clays? The writer feels strongly tempted to devote the entire paper to answering this question, and feels keenly how unsatisfactory it is to dismiss it with a few words. We can, however, say that chemical and physical tests have been devised which determine the qualities of a clay, its possibilities and limitations. By means of the rational chemical analysis it is possible to determine whether or not a clay is suited for the manufacture of face brick, of fire brick, of roofing tiles, of stoneware, or the higher grades of clayware. Chemical analysis will tell you whether the iron in your clay is in a proper condition for a good red color, whether it is present as a higher or the lower oxide, the carbonate or the sulphide, whether it will stand rapid burning or whether it must go through a slow heating process. It also tells us whether it contains enough of the soluble salts to make it unfit for the manufacture of architectural clayware, and it determines the value of a fire clay with regard to its use in the metallurgical industries.

Hand in hand with the chemical analysis go the physical tests, which examine the clays in regard to structure, shrinkage during drying and burning, bonding power and plasticity. By means of the microscope and the process known as mechanical analysis the clays are dissected and their properties determined. Many examples of the practical use of chemical and physical tests can be cited, and many works which to-day struggle with difficulties would never have been built if suitable tests had been made. And not a few concerns which are suffering losses in the process of manufacture would be benefited by a more rational mixture of their raw materials. It is exactly this kind of testing which made it possible for the European manufacturers of porcelain to reproduce the porcelain of Japan so that the difference between the new body and the original cannot be told. Similarly it is possible for us to reproduce the famous floor tiles of Mettlack and Dresden. What more practical tests can be desired?

In the winning of raw material, what changes have taken place since the shovel and the hoe were the sole implements available for the getting of the clay! A mere enumeration will be sufficient to show the means now available by human ingenuity for this purpose. Shovels worked by steam or electricity, cars of all sorts, scrapers and gatherers, no end of conveyors using chains, belts and cables, and finally powerful explosives, all come to the aid of the clayworker.

A similar state of advancement exists in regard to the preparing and molding machinery, and it would be like carrying coals to Newcastle to name all the different machines now used in the clay industry with which you are all so familiar. Perhaps it will not be out of place to devote a word or two to the most modern phase of motors and to call your attention to the fact that for many smaller and larger plants gas engines and electric motors could be used to great advantage. In the smaller sized works, owing to their efficiency and simplicity; in the larger ones, owing to the considerable saving caused by the doing away with the dead load of long lines of shafting and better distribution of power.

In the drying of clayware the problem

of safe and efficient drying is no longer a vague one, but has assumed a definite shape; that is to say, we can calculate the conditions for the best drying to a nicety. There is no longer an excuse for inefficient, wasteful driers nor for their irrational operation. We can calculate the exact amount of heat required to dry a thousand brick, whether we use steam or direct heat. We can figure the amount and velocity of air necessary for the same purpose, and can adjust the distribution as well as the degree of moisture of the air to suit the required conditions. This can be done with as much accuracy as is obtained in the construction of engines or blast furnaces. There is no guess work about it. It is possible to examine actual conditions of drying by means of instruments which science has provided for us, such as the thermometers, barometers, hygrometers and anemometers, measuring respectively the temperature, the atmospheric pressure, the degree of humidity and finally the velocity of gases. These instruments are not scientific play things, but are means of stating actual conditions in the most accurate manner.

Scientific help can be applied to burning as well as to drying, and, if the present state of our knowledge in regard to kilns is not as satisfactory as it might be, it is simply due to our lack of application in this respect. It is perfectly feasible to measure the heat required to burn a given amount of clayware, to calculate the volume of air necessary to burn a pound of coal, the velocity of air required for the combustion of a certain amount of fuel in a given time, or, in other words, the draft, the temperature of the kiln, and finally to determine the conditions of the kiln gases in regard to economy as well as in respect to their effect upon the clayware. These statements are by no means extravagant. The subject of burning is not hidden in mystery, but depends upon well-known principles. By means of the calorimiter anyone can determine the heating value of coal, and, knowing the amount of combustible matter present in the fuel, a little arithmetic will tell us how much air is required to burn a pound of it. One pound of pure coal or coke will always require eight pounds of air for complete combustion. Again, starting from this information, we can calculate by another step of arithmetic how rapid the flow of air into the kiln must be. When burning, say 1,000 pounds of coal per hour, it is evident that, theoretically, at least, 8,000 pounds of air must be brought into the kiln per hour, and there must be draft enough to do it. Based upon similar facts we can figure up the efficiency of the kiln, and determine whether it is leaving the heat where it is made useful or whether your expensive fuel is being used to keep the stack and the clouds hot. Although the stack must be heated in order to produce the desired intensity of draft, there is no excuse for letting more heat pass through it than is necessary to do the work. A stack may be compared with a steam engine. No more steam should be used in the engine than is required to produce a given power, but too little steam is as bad as too much. I trust enough has been said to indicate the scope of systematic work in this connection, and there is no doubt but that large sums of money could be saved in many cases in which no attention is paid to fuel economy. Some of these considerations, which involve the dimensions of the kilns and stacks, are perhaps of greater importance to kiln builders than to kiln users. The facts which should interest the latter are the ones dealing with the regulation of the burning. For this purpose the determination of the temperature, the draft and the kind of kiln gases prevailing during the burn must always furnish the most useful information. It is a matter of satisfaction to clayworkers that at the present time we are fairly well furnished with apparatus for giving us actual figures in regard to temperature, draft and condition of kiln gases. Any clayworker who wants to know accurately how the heat in his kiln is rising, what the maximum temperature is and at what rate the cooling takes place can obtain these data by purchasing one of the modern pyrometers depending either upon the expansion of air or upon the electrical principles. Although expensive and requiring care in handling, such pyrometers furnish most useful and practical information, and make burning a pleasure rather than a troublesome, risky operation. It should be understood, however, that such instruments, in order to be useful, should be properly appreciated and not be put at the mercy of an ignorant or prejudiced person. That pyrometers are gradually being recognized as valuable helps is amply proven by the fact that a number of the leading, most progressive clayworking establishments of the United States are equipped with them, and find them practical and useful. But the great majority of clayworkers may not find it convenient to have such apparatus, and for them means of the most practical kind have been provided in the shape of pyrometric cones, with which undoubtedly you are all familiar. Their use needs no explanation, and it is to be hoped that all clayworkers will make use of these simple, practical and cheap pyroscopes.

For measuring the draft, draft gauges of various constructions are on the market, most of them being very cheap and extremely simple in construction. It seems a pity that this instrument finds so little application in practical work, although it may be made to play such a very useful part. Since the draft of a kiln varies within quite a large range, according to the state of the atmosphere, the manner of setting, the heat of the kiln, would it not be a good plan to determine the proper draft once for all, by means of an accurate instrument, and to control the dampers accordingly? It is not within the scope of this paper to enter into details of the different types of draft gauges, but I shall be glad to describe them to any one who is interested in this matter. The draft gauge certainly deserves a place among the helpers of the clayworker.

In regard to determining the conditon of the fire gases, I would like to call your attention to a very simple and inexpensive instrument, the so-called Orsat apparatus. It determines by means of absorption in three different liquids the carbonic acid, the free oxygen and the partially unconsumed gas, the carbon monoxide, and in this manner tells us the truth about our burning, whether we have to much or too little air in our kiln. If a clay requires a clean oxidizing fire for best results this instrument tells us whether we are actually firing in the best possible manner; and, on the other hand, if we want a dark color, obtained by a smoky fire, it will also let us know just how much air there must be lacking. Although quite simple in construction, some care is required in its manipulation, and I doubt whether it would be found convenient around the average clay plant, a fact which, however, does not take away anything from its good qualities. It gives information nothing else can furnish.

Human ingenuity has not been idle in the field of kiln construction, but for many years it has been the aim of men of high intelligence to construct kilns which should embody the highest fuel efficiency and the best possible distribution of heat. It would be a task much beyond the limits of this paper even to attempt a classification of the modern kiln systems, but I would like to devote a few words to the most efficient of all kiln systems, as far as fuel economy is concerned—that is, the continuous kiln. With the price of fuel rising every year and the supply of coal decreasing at an enormous rate, the time is not far off when the fuel question must receives more earnest attention. In the continuous kiln the utmost economy of fuel consumption is being practiced, inasmuch as the heat of the cooling ware as well as the heat of the waste gases is being utilized. The objections to this type of kiln are the comparatively great cost of building, the more complicated operation and the difficulty of burning clean colored ware. It must be acknowledged that these objections are serious, indeed, and that at the present time the great majority of plants could not make the continuous kiln pay. But, with the improvements being made continually, and especially with the growing use of artificial gas made from the very poorest of coal and slack, its ultimate success is bound to come. To the student of the mineral wealth of the United States it is a discouraging fact to know that millions and millions of tons of slack gradually go to waste in the mining districts of Pennsylvania and Ohio. However, the use of gaseous fuel is destined to save what can be saved from this so-called waste, and the continuous kiln fired with gas must be regarded as the ideal kiln.

The higher we go in the scale of ceramic cases the more direct does the application of scientific work become. This is especially true of glazing and to application of colors. The contrast between the old and new methods is nowhere brought out more strikingly than in this branch of clayworking. The application of glazes used to be a matter full of mystery. Glaze recipes were esteemed of great value, although there was no guarantee whatever that the glaze would fit the new body. That the loss attending this uncertainty of proceedings was enormous is not surprising. And, wherever a successful glaze or color was obtained, the process was kept secret under the greatest precautions, even to the extent of imprisoning the lucky or unlucky master of the secret. But conditions have changed wonderfully. To-day it is possible to make a glaze fit almost any body with surprising accuracy, and it is not necessary to devote years of experimenting to the task. Where the facilities are at hand, four weeks should suffice to adopt to a clay the kind of glaze or enamel which is desired. And, more than that, we now not only have the means of producing the glaze, but also of maintaining the desired quality of the glaze throughout the processes of manufacture. This is especially the point where the money value of our knowledge comes into play and many instances could be cited where manufacturing of high-grade wares is largely based upon practical methods of applied science.

The marvelous extent and growth of the clay industry will more and more demand systematic work. For instance in the manufacture of roofing tile, ornamental hollow blocks, glazed bricks and tiles, floor tiles, sanitary ware, chemical stoneware and what not, problems will constantly arise which demand the attention and skill of the trained man. For instance, simple though the problem of making roofing tile may appear, there are connected with it problems of modern architecture which involve the figuring of plans for regular and special roofing work, the laying out of tower tile, the cutting of hip and valley tiles, the ordering for making of roofing terra cotta, etc. There are also to be considered the making of plaster dies and molds, the setting, burning and finally the making of estimates, and the maintenance of a system of keeping records and handling orders.

On the other hand, it cannot be denied that to the trained, hard-working clayworker there is open a large field which has hardly been touched and which beyond doubt offers satisfactory returns. I need mention only ornamental hollow blocks, roofing tiles, electrical porcelain fittings and chemical stoneware. The latter, especially, is a branch of industry sadly neglected in this country, though well established in Europe. The enormous growth of the vast chemical industries has created a large demand for vitrified, acid proof stoneware, made up into the various apparatus and utensils used in chemical manufacture, such as Woulfe bottles, condensers, tubing, filters, troughs, etc. This demand is to a large extent supplied by Europe, although American clays and skill, if applied, would soon triumph over the European wares. Another branch of the industry from which great development is to be expected is the manufacture of decorated hollow blocks. There is no question but that the hollow block business, when worked out carefully and brought before the public in the proper light, will prove an important factor in modern architecture, but it requires skill and prudence.

In these words I have endeavored to make a crude outline of the practical application of science to clayworking and also of some of the possibilities of our industry. Even from the very outset it is evident that details could not be considered in this review, and if it has succeeded in offering a sort of bird's eye view of the subject I should be more than grateful. But the conclusion which we must draw is evidently that the application of science has been of great help to our industry, and we may be assured that the problems of the future can be solved only by the trained and practical clayworker. (Applause.)

The Chair: If any desire to ask questions of Mr. Bleininger, now is your opportunity.

Mr. Halbeisen: I would like to inquire as to the measure for drafts. I think it would be a great help to many tile men if we knew accurately the amount of draft we were getting in the kiln. What part of the kiln do you apply this instrument to measure draft?

Mr. Bleininger: The best place to apply the draft gauge is, of course, near the stack, but it may be applied to any part of the kiln. As a matter of fact, you can apply it wherever you may want it, and in case there is a difference in draft on one side or the other, you can apply it on either side and ascertain the difference. Of course you can control the draft by the damper. The advantage of the draft gauge is that it brings the whole question of draft down to actual figures.

Mr. Blaser: What is the cost of such an instrument?

Mr. Bleininger: An instrument like the one described, the best instrument, ought not to cost over five dollars. One can be made for a dollar and a quarter or a dollar and a half, but of course not equal to the first mentioned.

—Reports of Committees.—

Mr. Weaver, on behalf of the committee appointed to go before the Legislative Committee having in charge the bill for licensing engineers, reported that the time before the committee last night had been occupied by a committee from Cincinnati in the interest of the organized engineers of the State, and it was gathered from their talk that the bill was really one for the maintenance of engineers' salaries. Mr. Weaver and his committee had been unable to secure but a few minutes audience with the committee of the Legislature and felt that this committee would recommend the bill. He urged those present to use whatever influence they might have with their respective representatives in the Legislature in opposing the passage of the bill.

On motion of Mr. Wilson, report was accepted and committee discharged.

The Committee on Resolutions, through its chairman, Mr. Blaser, submitted the following resolutions and recommended their adoption:

Resolved, That we tender to the officers of the Ohio, Brick, Tile and Drainage Association, J. W. Everal and Ed. F. Darnell, our thanks for their efficient and splendid service.

Resolved, That we also tender to our friend, J. J. W. Billingsley, our thanks for his presence and encouraging words, and wish for him many long years of usefulness.

Resolved, That the clayworkers of Ohio emphasize the industrial importance of their business, and enter, enthusiastically, the coming century, upon a campaign of educating the public as to the importance and value of their products as healthful and beneficial agents, first, by the use of drain tile in improving soil conditions and its productiveness and as a sanitary benefit, also by a more general use of its building material.

Resolved, That this asosciation condemn the action of the lower house of our Legislature in the passage of a bill to license so-called steam engineers, and trust and pray the Senate to defeat the bill, believing it will inflict a great injustice upon many of the business interests of the State, and especially upon clayworkers and taxpayers.

Resolved, That we tender our thanks to the City Council for the use of their chamber to hold the sessions of this Association.

Resolved, That we tender our thanks to Mrs. Kalb, of this city, who has for years labored for our interest, and, with womanly patience, has borne with our blindness and mistakes, and, with ability, has presented to the reading public our deliberations in an acceptable form.

The foregoing resolutions were voted upon as read, and unanimously adopted, the last by a rising vote.

In response to a call for report of the treasurer, Mr. Darnell responded to the effect that the former treasurer, Mr. McClure, had informed him that there was nothing in his hands and that no papers or matter of any kind have been received by him, so there was really no report to make. Forty-one members had paid their annual dues at this meeting, and he felt sure there would be no deficiency to look forward to after settling all expenses for this meeting, and there would be a better basis for the work next year.

—Election of Officers.—

The Committee on Nominations recommended the re-election of the old staff of officers with the exception of the treasurer, who has declined to serve, having identified himself with other business interests, the list standing as follows:

President—J. W. Everal, Westerville, O.

Vice President—W. C. Wilson, Brice, O.

Treasurer—E. O. Biglow, New London, O.

Secretary—Ed F. Darnell, Grove City, O.

Mr. Everal strenuously objected to the consideration of his name for another term of office and asked that it be withdrawn, but no heed was paid to his objection and on motion the rules were suspended and the secretary instructed to cast the unanimous vote of the association in favor of the persons named by the Committee on Nominations.

Mr. Everal gracefully accepted the situation when it was apparent that no other course was open to him, and stated that though he would much have preferred that the honor should have been conferred upon someone else, since it was the unanimous wish of the association he would direct his best efforts to the advancement of the interests of the association for the coming year, and solicited the assistance of the members in his work along this line.

The Chair: I am not taking any credit to myself, but I think we have had a very good, entertaining, instructive and beneficial gathering at this meeting. I think if we will pay heed to the papers and addresses which have come before us, we will be immensely benefited and amply paid for our trip to Columbus, outside of the social feature of the occasion, which we have all enjoyed, I am sure.

Mr. Blaser suggested that next year the members bring their wives with them when they attend the meeting, and that proper arrangements be made for their entertainment, including a banquet in which both the members and their wives should participate. This suggestion seemed to meet with general approval and it was agreed that the experiment should be undertaken next year.

Upon motion, meeting adjourned until 1901.

LIST OF MEMBERS.

John W. Kellough, Cook, O.
S. Fish & Son, Milan, O.
J. J. W. Billingsley, Indianapolis, Ind.
T. A. Randall & Co., Indianapolis, Ind.
Landrum & Landrum, Centerburg, O.
J. D. Fate & Co., Plymouth, O.
Duvall Brick and Tile Co., Duvall, O.
W. W. Chadwick, Condit, O.
T. A. Horn, Lilly Chapel, O.
Harry Landrum, Hebron, O.
M. D. L. Menter, Kenton, O.
Alvin F. Potter, Worthington, O.
R. M. Imbody, Agosta, O.
H. Sniveley & Son, Odon, Ind.
J. W. Huffman, Pleasant Bend, O.
E. M. Freese & Co., Galion, O.
Elder & Dunlap, Bloomington, Ill.
F. O. Corbin, Union Furnace, O.
Joseph Hickson, Mt. Gilead, O.
Brice Clay Co., Brice, O.
H. D. Weaver, Sparta, O.
E. L. Luther, Adrian, Mich.
J. W. and Frank Everal, Westerville, O.
Ed F. Darnell, Grove City, O.
M. A. Shuler, New Dover, O.
W. A. Eudaly, Cincinnati, O.
F. T. Hedge, Prairie Depot, O.
D. M. Luisse, Prairie, Depot, O.
Frank Halbeisen, Erlin, O.
Swift Furnace Kiln Co., Washington, Ia.
Blaser, Kingli Bros., Nevada, O.
E. Biglow & Son, New London, O.
J. D. Rumsey, Stryker, O.
John H. Pfirsch, Cardington, O.
O. H. Swinger, Painter Creek, O.
James Stilt, Frazeysburg, O.
W. W. Reehl, Bucyrus, O.
W. B. Henry, Lancaster, O.
W. E. Nelson, Greenville, O.
Morton Rogers, Arcanum, O.
Illinois Supply and Construction Co., St. Louis, Mo.
Blanchester Brick and Tile Co., Blanchester, O.

WANTS INFORMATION ABOUT BURNING BRICK WITH LIGNITE.

Editor Clay-Workers

I wish to ask a question through the columns of The Clay-Worker, and hope some worthy brother clayworker can give me what I desire—light.

I have followed the discussions through The Clay-Worker for perhaps twenty years on subjects pertaining to kiln fuel, etc., of all kinds, and as far as my recollection goes, I have not seen brown coal or lignite mentioned as a fuel for burning brick.

I have had quite a checkered career with lignite in up draft kilns running over five years, with lignite as our only fuel for burning. The question I want to ask is, "Has any one used lignite in down draft kilns?"

The brick business in this section is good and the prospect for future business is good. We have had a very rainy spring, but when the weather permits, we are running full time.

Very truly,

J. B. MORRISON.

Written for THE CLAY-WORKER.

SOME COSTLY BITS OF EXPERIENCE.—No. 3.

L. C. Moore.

MY NEIGHBOR DISCOVERED a fine bed of shale, something very rare in our part of the State. He sent a barrel of it to a machinery company to be tested, and the samples of bricks burned from it were so fine that he could not resist the temptation to start a factory, that such a fine raw material should be put in shape to be of use to his neighbors, and make him a small fortune in the bargain. There were several matters of minor importance that he overlooked, but when one owns a superior bank of clay, no matter if it is three miles from the railroad, such small matters must not be permitted to kill such a promising enterprise. He figures that he will soon make enough money to build a railroad of his own, so no matter if the road for the delivery of his product is rough, steep and long, those are inconveniences to be sure, but not obstacles worthy of serious consideration.

A machinery man talked him into buying a dry press outfit, set it all up for him from trucks to boiler, and started the wheels to rolling. Of course it all worked nicely, for the machinery company sent a man who knew his business and made no mistakes in his part of the work. The bricks were perfect so far as the green product was concerned, and there seemed no possibility of a failure. Then the agent collected the first payment, secured the notes for the second, third and fourth payments, and took his leave. He had done his part, and it was well done. And any good manager surely could take charge of the plant as now installed, and have a sure thing that only needed pushing along.

My neighbor pushed it along as best he could, for all this was new to him. He burned in scove kilns, and many were the sleepless nights spent when the rains fell and the winds blew upon the leaky roof of that old kiln. But at last the fires were started in the arches, and a test was to be made whether the finished product should fulfill the promise of the green fruit. This burner knew no more about burning dry pressed bricks than he had learned on the hand mold yard, where he had spent the greater part of his life. And, though burning bricks, whether they be sand mold or dry pressed, is governed by common sense rules that hold good in all cases, still a graduate from one yard can hardly be trusted with the full management of the other. With this burner, there was new clay, and new process of manufacture, either of which circumstance is sufficient to make the most experienced burner careful how he proceeds, and makes him doubtful of results until he can open the cooled kiln and see the finished wares.

When finished, there were all kinds of brick in that kiln. The customer could pay his money and take his choice. My neighbor was a business man when it came to selling, although he lacked some of the essential qualities of a successful manufacturer. All of those bricks were sold, and many of them were paid for in groceries and other necessaries of life long before they were burned. But he had missed his calculations in one small matter, for he had sold all good, sound bricks, like the samples burned by the machinery company, and that kiln fell short of such a calculation by about fifty per cent.

To be sure, he had some bricks in his kiln as good as those samples, but this only showed the possibilities that lay within his outfit, and did not help him out of his present difficulties. His cash customers would have nothing but the best bricks, and it is one of the inexplicable problems of our trade to figure out how the cash customer gets all of the good materials, while the man who has furnished us groceries, or honored the time checks of our employes long after the bank has ceased to do so, gets the poor stuff that will not sell for money. But so it is. The man who pays for a thing before he sees it is worse than a blind man.

My neighbor began a hurried delivery of his best materials to get money to proceed with his work. He could deliver to his creditors at his leisure. It was then he realized the inconvenience of a long haul to market. It cost him $1.50 per thousand to get his bricks delivered, and he was forced to compete with a man who could deliver for 50 cents per thousand. His customers admitted the superiority of his bricks, but claimed that hand made bricks had always been satisfactory, and they would not give him more than customary price for common bricks. They preferred his to the others at the same price, and he sold them and stood the loss for the extra cost of delivery.

He deemed it a fortunate circumstance that the town council had passed an ordinance prohibiting wooden sidewalks, and he took great pains to show the good qualities of his bricks for this purpose. They were as hard as iron, perfect in shape, and would make a sidewalk as smooth as a tiled floor. He carefully selected these walk bricks, for they were to bring the cash, and he wanted them to be an advertisement for his work. They made beautiful walks, so smooth and even under the tread. His demand was greater than his supply—for his supply of this class of bricks was only a small per cent. of his total output, and then he got his first contract for a building. It was a fine season for brickwork, and soon the building was completed, and many feet of sidewalk were put down with his best material.

All looked lovely, and work on a new kiln was progressing rapidly, when a season of wet weather set in. A few days of rain on his bricks made a test of them of which he had never thought. Whenever they became saturated with water, they split to pieces as though possessed of an evil spirit. Those walks were a wreck within one week's time. And though the building stood seemingly substantial enough, its front and sides looked as though they had been attacked by a thousand Missouri woodpeckers, with beaks strong and sharp enough to bore holes in a grindstone. The ground about the building was covered with chips and spawles that had fallen from the faces of the bricks, leaving the building an unsightly advertisement of one man's failure to be sure he was right before he went ahead.

Here, indeed, was a sad state of affairs, and how was he to extricate himself and save himself from bankruptcy. He had no idea what the matter could be, but blindly put the blame upon the dry process. He knew nothing of chemistry, and it never occurred to him that any expert in clays could readily point out to him the trouble, and, perhaps, suggest a remedy. He was driven to distraction by his failure, for customers dogged his footsteps, some to countermand orders, others to demand that he should make good the guarantee he had placed upon his bricks, but no one came to order more. It was now time for the second payment on his brick machine, but he refused to pay more on it, claiming it to be a failure. The machinery company instituted suit for the amount due. Many customers who had suffered from the failure of his bricks and his numerous home creditors threatened to do the same. If the quality of his bricks had been equal to that of his nerve his factory would have been a bonanza. Instead of giving up the ship, as most men would have done, he secured a postponement of the machinery suit, made arrangements with his home creditors to give him another chance, and set about to find some means of escape from his dilemma. To shut down the factory and turn matters into the hands of a receiver, meant bankruptcy. On the other hand, to continue in the old way meant going still deeper into the mire. But a commencement had to be made to solve the difficulties. He wrote to another machinery firm and laid his case before them. Their method of solution will be given in our next.

(To be Continued.)

FOLLOWING UP.

The papers cannot do more than half the work in making a success of any business. The paper will bring the inquiry, but the advertiser must do the real selling. Just there is where he is inclined to shirk. He sends a circular, or catalogue, and then sits down with folded hands to wait for orders. He should do more. He should follow up his catalogue with letters, not one or two, but many, until he finally gets his order. He goes to considerable expense to get a prospective customer, and then lets him get away through not "keeping everlastingly at him." If all advertisers had a systematic plan of following up inquiries, successes would be many more than they are now.—Judd's Jolly Jottings.

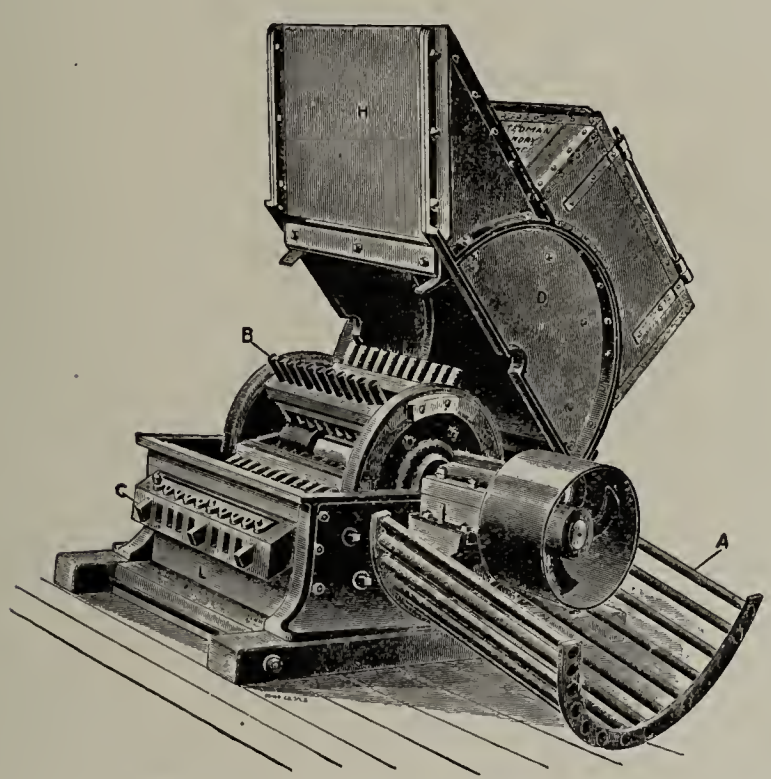
TWO NEW MACHINES.

A Pulverizer That Grinds Shale or Clay to Any Fineness—And a Clay Screen That Will Not Clog.

It is our privilege to introduce to the trade this month two new machines for preparing clay and shale for the manufacture of brick by the dry press process and for various other purposes. Both appliances are the invention of one firm, the Stedman Foundry and Machine Works, Aurora, Ind., a firm well known to all clayworkers, for they have been engaged in the manufacture of clay pulverizers for many years. These new devices are the result of much experiment, painstaking effort, and a thorough knowledge of the needs of the trade. Each device embodies some entirely new features that give great capacity, strength and durability.

—Mechanical Construction of Stedman's Cyclone Pulverizer.—

The main frame is of cast iron of a heavy and substantial design. The cover or top is hinged so that it can be thrown back and the internal parts looked after in a short space of time. The grinding mechanism consists of a revolving cylinder constructed with two heavy cast iron disks that support 2x4-inch cross steel bars. There are six of these 2x4 steel bars around the cylinder and these bars are drilled for 1¼-inch steel pins. These steel pins (see B in cut) pass through this 2x4 steel bar and their lower ends are tapped into a 1x4-inch plate some two inches directly under the 2x4 steel bar. The pins B are held in position by means of jam nuts close against the 1x4-inch plates. As the ends of the pins B wear they can be moved out by means of the thread adjustment on the lower end of pins where they are tapped into the 1x4-inch plate. The full width of the cylinder is covered with the bars as each row is so drilled that the row back of the other covers the space on the row in front. This cylinder revolves at a speed of about 1,000 revolutions per



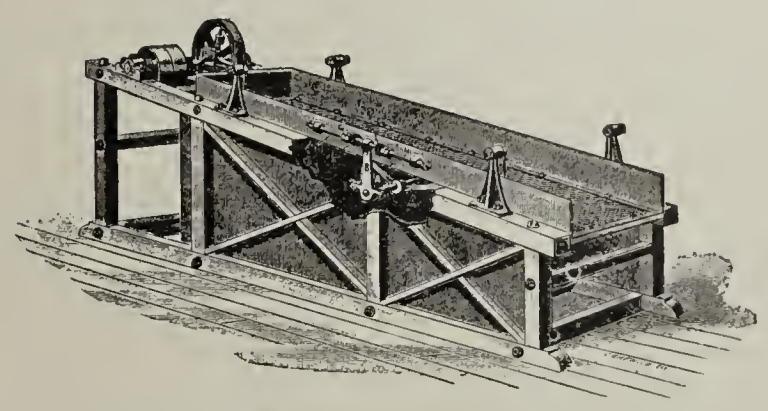
Stedman's Improved Cyclone Pulverizer.

minute and the points of the pins B travel close to a 5x1-inch steel knife just at the base of the Hopper H. This knife sets at an angle and is moved in and out by means of the legs C in cut so as to bring the cutting edge of the knife close or far away from the points of the pins B. Most of the grinding is done between the cutting edge of the knife and the points of the pins B as the pins revolve at a high speed close to the knife, and then it passes through the screening cage A which fits in the frame under the revolving cylinder. The pulverized clay passes through this screening cage into the elevator and up onto our Agitator.

—Stedman's Agitating Incline Shaker Screen.—

A good screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. The Stedman Incline Agitating Shaker Screen will meet the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run



Stedman's Agitating Incline Shaking Screen.

with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter weight within the rim of the balance or fly wheel.

—Description of Mechanical Construction.—

This Agitating Shaker Screen is mounted in a substantial frame work and the bin or storage part of the screen is encased with tongue and grooved flooring. The screen is supported on top of the wooden frame by means of four cast iron stands in which swings the four trunions that give the shaking motion to the screen. This screen is driven by 12x6-inch tight and loose pulleys at a speed of about 300 revolutions per minute. The crank has a ⅝-inch stroke which gives a travel forward and back of 1¼-inch to the screen.

Under the screen and in its center is located the Agitating Lever AA. This lever is keyed to a shaft that runs under the screen and is supported on its sides by journal bearings fastened to the side timbers of the frame. The end lever is keyed to the end of this shaft and its upper end passes through the rod HH. On this rod HH are adjustable check nuts with a rubber bumper or washer in front of these check nuts. By moving these washers close to or far from the end of lever B it regulates the force of the blow that the ends of lever AA will strike against the screen wire.

As the screen travels back and forwards by the crank motion the lever B hits first one washer D and then the other D. This gives the motion to the agitating lever A, causing first one end then the other end to hit the screen wire a successive number of quick blows, which prevents any sticky or gummy substance you may be screening from sticking or clogging the screen wire.

Anyone who has had experience in screening different materials can readily appreciate the advantage of this agitating motion against the screen wire.

The manufacturers will be pleased to give further details to any of our readers who will address them.

THE FORCE OF EXAMPLE.

A correspondent of the Michigan Artisan says one furniture factory superintendent under whom he worked "made it the rule of his life to never pass through the factory at a moderate speed. It was his habit to rush through the departments, not only for the purpose of making the most of his time, but to instill into the men employed the energy and hustle for which he was noted. His spirit was contagious, and every man in that shop became a hustler."

AN UNLUCKY BURN.

THE DARNDEST queer burn I ever saw happened up in Maine last year. The kiln was built in a country yard that had lain idle for several years, and, there being no other yard for a hundred miles either way, the farmers had completely cleaned out every vestige of burnt brick. In the boom of last spring the yard was rehabilitated and the machines were soon grinding out brick.

When it came to setting the kiln there were no burnt brick for stretcher courses or flooring, and the boss was compelled to resort to the primitive method of placing inch-and-a-half plank under the benches.

The brick made were thinner than they should be to compare with their length, and the result was they set loosely as a rick of straw. There being nothing for platting, the boss, who hadn't been near a brickyard for nearly a score of years before, used his rain-washed green brick for that purpose, but, instead of wisely laying them in a double course, flat and crossed, he used the old single course, or bridge and stringer method. He made a greater mistake by putting the entire season's output into one kiln of 500,000, more or less. Had he burned two kilns of ten arches each he would have had burnt platting and bench stringers for his last kiln. But he put his entire product into some twenty arches and platted them with green brick, and then set fire. It was clay full of sand, and the way the fire went through the top of that kiln after the second day scared the boss so that he slackened fire. And that was mistake No. 3 in his list of great mistakes, for he was dealing with a kiln that needed no tender nursing, but fairly roared, like a spoiled child, to be properly dressed and have its bottom thoroughly warmed. In putting on the roof the men had traveled a great deal over the top of the kiln, and wherever they stepped they broke the platting, so that the kiln, loosely set in its body, was as open as a sieve on top.

When the boss, after slackening heat, attempted to revive it he found it impossible to get wood enough into his arches to get more than a cherry heat on the benches, while the wood simply vanished as if by a magician's power into the kiln.

After nine days' burning the wood played out, and for lack of fuel the kiln was closed. The top showed scarcely a sign of a settle, and every prophet who looked upon it declared it a lost kiln. Yet it seems that the prophets were not wholly in the right, for many arches in the kiln showed hard bricks close to the top. But the peculiar thing about it is that the color grows lighter the deeper into the kiln it goes. There are many things about this kiln that I would like to have answered by the experts. What would you do if you found you had made the mistake the boss did in slackening fire? How would you proceed, with the aid of two not overbright one-season brickmakers, to govern that kiln? Why is it, with the platting so free and loose, that the top is better colored than the body of the kiln?

There are other whys and hows that I would like to propound, but I am tired already. It was a queer burn.

THE DREAMER.

FROM ACROSS THE BORDER.

Mr. T. A. Robertson, secretary and treasurer of the Clay Manufactura de Ladrillos, Monterey, N. L., Mexico, in renewing subscription, writes that they are contemplating changing their system of burning so as to use crude oil as fuel, and will be pleased to hear from parties who can furnish them plans and specifications for an equipment with improved burners, etc. Coal is very scarce and dear in their section, and they think they can get oil from the United States at a price that will justify its use.

DOES THE "BERG PRESS" INFRINGE THE BOYD PATENTS OWNED BY CHISHOLM, BOYD & WHITE CO?

Mr. Editor: This is a pertinent question and will be fully determined by the United States Court. The general design of the Berg press, as shown in the published engravings, inclines even the casual observer to conclude that it does infringe.

In the communication of John J. Moroney, printed in your March issue, he blandly assures brickmakers that the "Berg" does not infringe the "Boyd," citing as conclusive proof a letter from B. C. White, which letter contains statements no honorable man or inventor would make, even if true, until compelled to do so in a court of law. The court is likely to accept "cum grano salis" the gratuitous statements of a man who thus stultifies himself after his solemn declaration under oath that he himself was the original inventor. When examined in court he may tell a different story.

No brickmaker is likely to buy a Berg press upon the irresponsible statement of either of these men. He will hardly take the chances of being himself sued as an infringer also, nor of being enjoined from using the press after the court has rendered its decision. The unsupported assurance of Mr. Moroney to protect him in its purchase and use, will have little influence with the careful buyer.

Hundreds of the Boyd brick presses are in use, all over the world, and that name is the synonym of success. They were all built under the protection of our many letters patent, which competent lawyers and experts declare to be good and valid. Competent counsel advised us that the Berg press does infringe our patents, and upon such assurance we asked the court to determine our rights, rights which reputable brickmakers will be careful not to infringe.

CHISHOLM, BOYD & WHITE CO., Chicago.

JAS. PRANGLEY BRICKYARD DESTROYED BY FIRE.

On the morning of April 10 the brickmaking plant of Jas. Plangley, Lancaster, Pa., was completely destroyed by fire. The buildings destroyed were a brick and frame structure, two stories in height and eight feet square, and a one-story structure, with brick side, 280 feet long. The main building contained the boiler and engine rooms, the brickmaking machine and other valuable machinery of the most modern invention used in the manufacture of brick, the plant having a capacity of 6,000 brick per hour. The long building adjoining was used for drying the brick. It was equipped with the latest improved system of drying and contained over 22,000 feet of 1-inch pipe, about 600 feet of 3 and 4-inch pipe, together with 87 iron cars which were operated on tracks. The pipe and cars were twisted into all shapes by the heat and are worthless. All the machinery in the main building was completely ruined, with the exception of the 100-horse power boiler, which was protected by brick walls. Both buildings were burned to the ground. The flames communicated with the storage shed and burning kilns, but these were saved by the efforts of the firemen. On account of the decrease in the demand for brick during the winter, and the fact that a large number were on hand at the yards, the plant had not been in operation since the latter part of January. A fire was kept under the boiler continuously, however, until the 7th, since which time there had been no fire about the building. During the past few weeks a number of orders were received for brick, one for 300,000, and Mr. Prangley proposed placing the plant in operation on the 11th. Mr. Prangley places his loss at $10,000 or $12,000, on which there is no insurance. As yet he is undecided whether he will rebuild the brick plant, or give his entire attention to the manufacture and sale of the Prangley Brick Machine and Prangley Sander, both of which are rapidly gaining favor among brickmakers, especially in that section.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

A News Note From Holland.

T. A. Randall & Co.:

Dear Sirs—It is with pleasure I inclose $2.50 for your splendid paper, The Clay-Worker, for another year.

The brick business in Holland was very good last year, but the prospect for the present year is not very good, owing to the high price of fuel and the fact that too many brickworks have been started.

In Belgian the brickmakers have sold nearly all the brick they can make this season, and consequently the price is higher than it was last year. Very respectfully,

Udenhout, Holland. HENRI F. T. WEIJERS.

A Kiln in Continuous Operation for Thirty four Years.

Editor Clay-Worker:

We take pleasure in inclosing herewith money order for $2.50 for The Clay-Worker for 1900. The brick trade is fairly good just now, although stock has accumulated more during the past winter than for several years past. We are complaining most just now about the high prices of fuel.

Perhaps you will be interested to know that we have one of the round type of Hoffman kilns that we built in 1866, and since that date the fire has never been out. The ouput of this kiln averages about 100,000 9x4½x3 brick per week. Yours truly, BENNETT & SAYER.

Derby, Eng., March 28, 1900.

A Rumbling Sound.

Editor Clay-Worker:

In the excellent paper, read before the convention at Detroit, entitled "Construction of Brick Pavements," it is stated that the greatest and most unpleasant sounds coming from a brick pavement are due to expansion and are heard in midsummer, when the brick reach their maximum, and are caused by lack of contact between the bricks and the sand cushion, occasioned by the resistance of the curb on either side of the roadway not being sufficiently great to arrest the lateral expansion in elevating the crown of the street. Either the essayist has said what he did not intend to say, or there has been a typographical error. (It was a typographical error. The word "not" did not appear in the author's manuscript. The original phrase read * * * "the resistance of the curb at either side of the roadway being sufficiently great to resist the lateral expansion" * * * —Ed.)

Certainly, if the curb was not sufficiently firm to resist the expansive force, then the arch would not rest upon the curb as a skew back and could not rise from contact with the sand cushion. If the curb was sufficiently firm, then we apprehend that even an oolitic curbstone might be broken, as stated by Mr. Blair. But the convention understood Mr. Grimes to hold that the curbs do really support the pavement. Mr. Eudaly said, "I saw just such a street and examined it with my own eyes, and I know that the noise was caused by the brick not touching the concrete, not only in that one spot, but clear across the street, and I know that curb held that pavement up just like a bridge."

Mr. Purington agreed with Mr. Eudaly, and said he had seen whole blocks in which the pavement was so sustained. We were pained by these statements, because we considered them a defamation of the character of vitrified brick as a paving material and because we believed, and still believe, that they were mistaken in regard to the whole pavement being supported by the curbing. It is certainly a remarkable feat in engineering to construct a brick arch of 40-foot span, 8-inch rise, and only 4 inches through the arch, so that it will sustain city traffic. Have you estimated the thrust in the skewback of an arch like that? A curb backed by a 6-inch wall would be a trifling skewback for such an arch.

We are willing to admit that the rumbling sound is caused by "the brick not touching the cement," and that the gentlemen named have ridden over block after block of such pavement, but we are not prepared to admit that in any instance is the pavement entirely supported between the curbs, because we have had no evidence that such is the case. No one could have known it to be so unless they had taken up a section carefully clear across the street and found it to be so. Examining the pavement with your own eyes and your own ears will not make you a competent witness.

Perhaps we can better reply by supposing a case which may or may not exist:

A brick pavement has been laid in Mr. Grimes's remarkably good style. (There is no irony in this statement.) After subjecting the street to heavy traffic for a time, the sand cushion is compressed along the middle of the street a very little, but the pavement, being slightly elastic, retains its original form. We then have a hollow space reaching from block to block much narrower than the street, and if we ride over it will hear a rumbling sound. If we should testify that it was owing to the cause stated, and that the hollow space was only the width of the wagon tracks, our testimony would be as reliable, and the cause stated as reasonable, as that upon which Brother Eudaly says "Mr. Tiffany is in error," and Brother Purington says "he has made a break." Sound is the most elusive and delusive agent that affects our senses. It travels from a center in all directions, pursuing direct lines, turning at right angles in a cord or wire, and reverberating until it dies away. It is like the wind "that bloweth where it listeth and thou hearest the sound thereof, but canst not tell from whence it cometh or whither it goeth." Do not be deceived by it.

We have no coefficient by which we may estimate the expansion of vitrified brick pavements. This should be determined. It would probably vary somewhat between the shales having a large percentage of iron and the Ohio River shales. It would cost very little to determine the expansion of each for every ten degrees from zero to one hundred and ten.

It is worthy of note that the expansion of concrete is more than double that of common brick. With such a good conductor connecting the brick and concrete, the concrete must be affected. If it expands only as much as the brick, then the curbs are moved by the concrete and the bricks cannot bear heavily against them. It may be that vitrified brick are more expansive than common brick, that they are as fearfully expansive as their inconsiderate friends describe them to be. We should be sorry to learn that they are. A writer in the Detroit Free Press, since our convention, advises going back to the old block pavement.

Readers of The Clay-Worker will see that there was a difference of opinion among engineers as to the cause of the rumbling sound.

W. K. Eldridge, city engineer of Lafayette, Ind., said: "Engineers are pretty well agreed that it is often caused by the shrinkage of the concrete." This cause was also sustained by S. C. Thompson, an engineer of New York city, and by James L. Breed, of Syracuse, N. Y. Mr. Eldridge further said in regard to the sound, "This occurs at all seasons, winter as well as summer, which indicates that it is not owing to the expansion of the brick."

We have not yet attained to the perfect art of laying brick pavements (as to which we may have more to say in another issue), but thanks to the painstaking skill of such men as Grimes and Eldridge and the persistent energy of such men as Purington and Blair, we can say, not that vitrified paving brick is the "paving material of the future," but of the present. TIFFANY.

Tecumseh, Mich., March 27, 1900.

Good Advice—A Convention Echo.

Friend Randall:

Can you advise me how the old timers, who do so much talking at the conventions, manage to keep up their correspondence necessary to answer all the questions which come by mail, apparently from all quarters of the globe, concerning what they said.

The few remarks I made at Detroit are raising Cain with

me. My stenographer is almost paralyzed, and my caligraph machine nearly worn out. I have already written all I know, and, no doubt, sometimes what I didn't know. I shall make a desperate effort to get through, but please do not get me in another scrape like this.

I aim to reply to all, and always tell them to read The Clay-Worker, and if I fail to find their names on the membership roll, I tell them come join our ranks, send Randall a V, and he will do the rest. Yours truly,

R. G. EISENHART.

Horseheads, N. Y., March 19, 1900.

Introducing Brick Roadways in England.

Editor Clay-Worker:

We inclose our subscription to your paper for the year 1900 and must congratulate you upon the able way you deal with the question of bricks for road paving. People on this side are slow to take it up, but we took the matter in hand some 18 months ago and have been working it up, satisfied that it is the pavement of the future, and have supplied several towns as an experiment, but look to a time in the near future when they will be as generally adopted as on your side.

The brick business here has been exceptionally good for a long time and is still fair, but at this time of the year it is usually slack, though will, no doubt, brighten up again when the weather opens out sufficiently for building operations.

GEO. WOOLLISCROFT & SON, LTD.

A. E. Blizzard, Director, Hanley, Eng., March 19, 1900.

A New Location for Fire Clay Manufacturing.

Editor Clay-Worker.

The completion of the Missouri Midland R. R. into Columbia, Mo., made available for manufacturing purposes one of the best cities of Missouri. Columbia has a population of 6,000, with two railroad systems, the Midland, connecting with the M., K. & T., and the Wabash. It is located midway between Kansas City and St. Louis, and is surrounded by inexhaustible coal and fire clay fields. The fire clay has been tested by the State Geological Department and found to be of exceptional purity. (See State Report on Fire Clays published by the State Department, Jefferson City, for free distribution.) These deposits of fire clay are 200 miles nearer the lead and zinc districts of southwest Missouri than the clays of St. Louis county, which now supplies the demand from that section.

For further information, address Secretary, Columbia Improvement Club, Columbia, Mo.

Brickmaking at Grand Forks, N. Dak.

Editor Clay-Worker:

There is a fair prospect of a busy building season here in North Dakota. It will not surprise those engaged in the brick business if brickmakers are unable to wholly meet the demand for their product early the coming summer. The brick plants in and about Grand Forks are now operating under a local organization, known as the Red River Valley Brick Co., an incorporation with a paid up capital of $50,000, composed of four yards, each with a capacity of 3,000,000 building brick per annum. For three years past, sales have averaged about 2,000,000. At present the yards have about 2,000,000 on hand, but hardly expect to supply the demand until new brick come in, which will be about June 10.

The first of the year the price of brick was $6.50 per thousand, kiln run; $7.50 per thousand for selected chimney brick. The clay in this vicinity burns a cream color and makes a very hard and durable brick. It is claimed here that the local yards make more brick than all the other yards in the State together. They not only supply the local demand, but also ship to points in Canada, paying a duty of 20 per cent.

All the yards will be run to the fullest capacity and the total output may reach 16,000,000 by the end of the season. More anon.

DAKOTA.

Grand Forks, N. D., April 10, 1900.

A Brickmaker Robbed.

Joseph M. Houghton, a well-known brick manufacturer and farmer at Guilford, Vt., was held up near the Brattleboro line a few days since and shot through the head, when he attempted to whip up his horse and escape. Three men were pursued and arrested, one of them being wounded.

AMONG THE PITTSBURG CLAYWORKERS.

THE UNITED STATES Fire Clay Manufacturing Company, a newly organized concern which absorbs nine large fire clay plants in western Pennsylvania and eastern Ohio, has opened offices in the Empire building at Pittsburg, and the general operating and sales department will be located in this city. Henry M. Kearby, a well-known New York fire clay manufacturer, is president of the new concern and the vice presidents are R. W. Allison and Percy C. Hamilton, of this city.

The Westinghouse Airbrake Company has begun the erection of 100 brick dwelling houses to be occupied by their workmen, at Wilmerding, Pa.

The new Pittsburg & Lake Erie depot in this city is about completed. The structure is a handsome fire brick, seven-story one, and fireproof throughout.

The Ligonier Silica Brick Company, whose plant is located on the Ligonier Valley road, is one of the new and vigorous Pittsburg firms in this line of brickmaking. The entire plant of this company is now in operation.

The Stuart Fire Brick Company, of this city, whose plant is at Farmington, on the B. & O. road, has just received a large contract for brick to be used on new sky-scrapers in this city.

The new United States Clay Manufacturing Company, of this city, has received the contract for supplying the terra cotta to be used in the construction of the new hotel which will take the place of the old Willard Hotel in Washington, D. C. The contract involves $100,000.

Reese-Hammond & Co., the well-known fire brick manufacturers, whose plant is located in Bolivar, Pa., is at present one of the busiest firms in the Pittsburg district. A number of additions have recently been made to their large plant at Boilvar.

Important clay developments are soon to be made in the Youghiogheny Valley. Already a number of large brick plants are located at McKeesport and other points in that section, and just now arrangements are being made to put in operation a number of new plants. The clay deposits of the Youghiogheny Valley are among the finest in western Pennsylvania, and much of the valuable lands in that section are now being bought by clay manufacturers.

Among the big buildings projected for this city which will carry with them big contracts is a sky-scraper to be erected by the Dollars Saving Bank. As yet the plans for the new structure have not been completed, but it is said that the new building will even eclipse the fifteen-story Park building on Fifth avenue.

A. J. Haws & Sons, Ltd., whose fire brick plants are located at Johnstown, Pa., are contemplating additions and improvements which will increase their annual output from 24,000,000 to 30,000,000 brick. This is one of the oldest fire brick concerns in western Pennsylvania, having been founded in 1856. At present the firm owns and operates six distinct plants, four of which are now being operated day and night.

A thirteen-foot vein of excellent fire clay has just been discovered at Berlin, in Somerset county, Pennsylvania, and steps are now being taken to develop the new territory.

GILBERT.

THE GRATH FURNACE A FUEL SAVER.

As previously announced in The Clay-Worker, the Ludowici Roofing Tile Co., of Chicago, recently equipped a kiln with the Grath coking table furnaces and are more than pleased with the results accomplished. They not only burn their ware much cheaper than by the old process, but do it better and with less labor. The Illinois Supply and Construction Co., who own and control the invention say that this is the experience of all who have given the Grath furnace a trial and they are introducing them on many plants. Among recent orders booked, they mention the Celladon Terra Cotta Co., Ottawa, Ill.; Cincinnati (O.) Roofing Tile and Terra Cotta Co.; Fulton (Mo.) Fire Brick Co.; Missouri Fire Brick Co., St. Louis, Mo.; Louis Hind, Vancouver, B. C.; Mitchell Fire Clay Co., St. Louis, Mo.; Enterprise Clay Works, Ogden, Utah; Manown (Pa.) Manufacturing Co.; Terre Haute (Ind.) Brick and Pipe Co.; Brazil (Ind.) Brick and Pipe Co.

The Illinois Supply and Construction Co. have also sold the following firms Grath Hand Power Presses (see cut on page 402): Coffeyville (Kan.) Vitrified Brick and Tile Co.; Otto Marstrand, Vancouver, B. C.; Hanover Press Brick Co., Columbus, O.

BRICKYARD BOILER EXPLOSION.

Two Killed and Several Wounded.

The sixty-horse power boiler at the brick works of the Williams Lumber Co., near Atlanta, Ga., exploded at 11 o'clock on the morning of April 2, doing much damage to the plant and killing Jno. M. Smith, one of the proprietors, and James Perkins, one of the employes. Several other employes were severely injured. The force of the explosion was terrific, carrying the boiler up through the roof and on like a great flying machine a distance of nearly 200 yards before it struck the earth.

The cause is not definitely known, but it is supposed that the big boiler was dry and some one turned cold water into it.

Unfortunately the accident happened at a time when the engine had been shut down for a few moments for repairs, and nearly all the employers were standing near it.

Without the slightest warning the boiler arose with a deafening crash, and, like a huge sky rocket, sailed over a small house in which lived a negro family, cleared the electric wires of the car line and fell fully 400 feet from the brickyard. It struck on one end, bounced clear across a country road and tore a great hole in the ground, where it finally settled. The boiler, strange to say, appears only slightly damaged.

A PRETTY CALENDAR.

J. C. Steele & Sons, Statesville, N. C., manufacturers of the "New South" brick machinery, have favored us with a very pretty calendar. It reached us too late to be mentioned with the regular New Year's crop. However, it really deserves special mention. It is a charming picture that might well be labeled "Way Down Upon the Su'wanee River, and, but for the calendar attachment and advertising feature, would be well worthy of a frame. Its mission is to inform the observer that the firm named manufactures all kinds of brickmaking machinery, clay cars, power presses, hoisting drums, pug mills, disintegrators, clay crushers, etc.

A NEW CATALOGUE.

We are indebted to the American Blower Co., Detroit, Mich., for a copy of their new catalogue, No. 111. It is a very handsome little book of forty pages, and contains a deal of valuable information about disc ventilating fans. It is profusely illustrated with fine half-tone engravings of the various styles of fans, blowers and motors manufactured by the A. B. Co. If you want to know anything about ventilating and drying apparatus you can get it for the asking. A letter telling what you want, addressed to the American Blower Co., Detroit, will bring a prompt response.

A GOOD AD.

A nice wall map of the State of Michigan has been received from the Zeeland, Mich., Brick Co. The white space within their regular store is utilized to good advantage with the announcement in type large enough to be read at some distance that the Zeeland Brick Co. manufactures white, red and sand molded brick for factories, schools, churches, blocks, dwellings, sewers, etc., and inviting prospective builders to write for prices. It strikes us as being an excellent ad., and, if distributed freely among the builders of their section, will bear good fruit for the enterprising company whose name it bears.

FIGHT WITH A BURGLAR.

Frederick S. Naugle, superintendent of the Onondaga Vitrified Brick Co., at Warners, N. Y., a Syracuse suburb, had a desperate fight with a burglar in the early hours of the morning recently, and was stabbed through the left arm and in the side directly over the heart. He will recover.

Shortly after midnight Mr. Naugle, who was alone in his house was arroused by noises, and, following them, came upon a burglar who was ransacking a bureau drawer. He closed with the intruder and seized his revolver, which was discharged in the scuffle. Then the men grappled each other by the throat. The burglar was forced down upon his back, but drew a knife and stabbed Mr. Naugle, who became weak through loss of blood and released his hold. The thief, who escaped, succeeded in finding only $15, which was in Naugle's vest pocket. Mr. Naugle says he can identify the robber.

GROWING POTTER—A FAIRY TALE.

Rare Natural Phenomena Which Makes China Immensely Valuable.

Recently there was sold in New York, according to an exchange, for no less a sum than $1,000, an old-fashioned china plate of the extremely rare kind which is known to the collectors as "growing crockery." From the plate itself had sprung to a height of more than a third of an inch, a sort of eruption of beautiful crystals that seemed to take the form of elegant trees and miniature pagodas. The growing crystals were gradually rising higher and higher, and they had brought up with them the enamel surface of the plate at every point where they had sprung from the body of the latter. Such plates are chemical manifestation of the rarest possible kind, and only a few years ago a teapot, the property of a lady in Woburn Place, London, that had become covered with beautiful crystals in this way, was sold to a collector for $5,000.

The clay of which such china is made contains alumina and magnesia, and in certain cases these are so acted upon by the presence of sulphuric acid as to produce fibrous crystals that are in reality very much of the character of Epsom salts, or crystals of alum. Only few, very few, instances of this "growing crockery" have ever occurred, hence the "fancy" prices that examples fetch. The plate sold the other day had belonged to a poor person who had never attached much value to it.

AT THE PARIS EXPOSITION.

The Imperial Royal Department of Commerce of Austria has for the convenience of the visiting public to the Exposition in Paris during this year organized a bureau for the purpose of furnishing full information in regard to any of the industrial branches of the empire represented at the Exposition or otherwise, with a view, especially, of facilitating commercial relations with the people of the United States, as well as those of other countries. This bureau, under the direction of the Imperial Royal Special Commissioner, Oscar Cronier, is now open, with offices at 15 Avenue D'Antin, and has at hand a force of special experts speaking English and other foreign languages, whose duty it is to give the most minute details that may be of interest, regarding any of the Austrian industries. All business men visiting the Exposition are cordially invited by the Imperial Royal Government to avail themselves of the service thus placed at their disposal, where much interesting and useful information will be obtainable.

STARTING IN A NEW TERRITORY.

Publishers Clay-Worker:

After two years of "vacation," seeking to get started in the brick and tile business in Bentonville, Ark., I was forced to hunt other fields, so part of the way by rail and part by foot I landed at the Cherokee Reservation, on the cow skin prairie, in a small place of 400 inhabitants called Grove Spring. The stakes were driven for the proposed line of the A. V. O. R. R. I was there when Mr. Baliss, the president of the railroad, mapped out the proposed town of "Grove" corporation line, one mile square, situated on the high plateau overlooking the country for miles, with its black soil and green wheat and soft spring water, an ideal town with an ideal country to back it. I found the mayor, and we soon had a company organized to make brick and tile and hollow block to commence work in the spring. Now I begin to feel myself once more. The man that makes brick here has always been here and grown rich, and will hold the trade, because he is not to be bucked against, especially by a man like myself, without money, but if I keep my health I shall be again climbing the ladder, using brick for stepping stones, and will want machinery soon. I will get prices on good second-hand and first-class machinery for the manufacture of brick, tile and hollow block; then we hope to greet all friends and customers at Grove, I. T.

F. M. GARDNER.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIII. APRIL, 1900. No. 4.

CURRENT COMMENT.

House cleaning-time is upon us. The brickmaker ought to tidy up his office just as the good housewife does the home. Brush away the cobwebs and get ready for a busy season.

* * *

In the tidying up process we trust those of our subscribers who have allowed subscription bills to accumulate on their desks, will brush them away, too, incidentally sending us a check for amount due, thus enabling us to do a little cleaning up. This is just a hint of spring.

* * *

Our Chicago correspondent tells a very interesting story this month. The brickmakers of the Windy City have consummated a plan long cherished by the leading spirits among them. All the yards have been purchased and will be operated henceforth by the Illinois Brick Company. The officers of the company are wise as well as forceful business men, and from this on the business will be conducted in the interest of both brick users and brickmakers.

* * *

New York State is to have a school for clayworkers. The State Legislature recently passed a bill appropriating $20,000 for the establishment of a department of clayworking and ceramics at the Alfred University. Fifteen thousand dollars will be used for building and equipment and $5,000 for maintenance the first year. This is a good move on the part of the solons of the Empire State and we hope in the near future to chronicle the successful operation of the school on lines that will do credit to the educators of that great State, and insure the development of her clay industries.

* * *

Many of our readers, particularly those engaged in the manufacture of pressed brick, will learn with regret that the series of papers we have been publishing, entitled "Modern American Front Brick," is concluded with the twenty-sixth number, which appears on a preceding page of this issue. The author has given the readers a vast amount of valuable information covering most of the important features of the business. As a whole, we believe the series to be the most instructive treatise on the manufacture of pressed brick that has ever been published, and we hope, in the near future, to republish the entire series in book form. The same able writer, "Americus," we regret that, through extreme modesty, he objects to our divulging his real name, will begin a new series of articles in the next (May) Clay-Worker, which, it is needless to state, will be equally instructive.

* * *

Those of our readers who are interested in brick pavements, and few are not, for most of the readers of The Clay-Worker are taxpayers, will find the second of the series of articles by Mr. Geo. W. Tillson, on "The Brick Streets of New York," very interesting reading. Mr. Tillson is a recognized authority on municipal engineering, and, when he says tha ta brick street, in the greatest city of the country, that is subject to exceptionally heavy traffic, after four years of hard service, shows no appreciable wear, it goes a long way toward demonstrating what we have claimed—that a well-constructed brick pavement is the most durable and satisfactory street that can be put down. This is a matter that every taxpayer should consider.

BRICKYARD STATISTICS.

The work of the Census Department, so far as it relates to the clayworking industry, is in the hands of Jefferson Middleton, who, as a thorough and accurate statistician, is well known to our readers in connection with clayworking statistics, which he has furnished to the Department of the Interior and which we have published at various times. The value of such work is, of course, largely dependent upon information given by the clayworkers themselves. There is sometimes a little hesitancy upon the part of some engaged in the business in giving forth information as to the volume of business as well as the quantity and character of product. In this connection, however, it is well to remember that the Census Department or any of the statistical departments of the Government do not give out information in a detailed way and that no personality is attached to any of the figures set forth. All information given to them is treated as strictly confidential. We commend the work of this department to our readers and hope that they will enter into it in a hearty spirit of co-operation.

BUILDING PROSPECTS.

Here in the North the grass is beginning to grow and people are beginning to build. It is the time for the hatching of new schemes and things. However, we are not sorry to say that this year will not see the amount of speculative work that was carried forward a few years ago. Building work that is being done at this time is on a solid basis. People are building because they have good reason to build. They see absolutely profitable investments. Advances in the price of material have naturally cut off speculative work. Particularly is this true in the matter of the price of steel and other metal. The first year after an advance in building materials always finds hesitating investors. The record of the past in values and the hope of a return to lower prices served to carry over many enterprises last year. Now that there is no immediate prospect of changes in values the solid investor,

the man with money, comes forward and takes his medicine. The thoughtful builder knows that good times generally bring higher prices. More people will build during good times, at higher prices, than can be found to build at low prices during hard times.

SMALLER BUILDINGS PREVAIL IN THE WEST.

The Eastern cities are doing more of the larger building than those of the West, but in the Western States there is being a great deal of substantial work done in the cities, and, as well, in the small towns and in the country. Brickmakers tell us that never before have they had the large number of relatively small orders for brick. One brickmaker said that he had a large number of orders, ranging from 10,000 to 100,000, and that he was getting better prices than he would expect to get for the corresponding volume of business in orders representing larger single quantities. This work is made up of the building of schoolhouses, churches, municipal and county structures, as well as the ordinary line of dwelling and commercial work. Any one who travels through the Middle West cannot fail to note the difference in the character of building work. The comparison of the new building which takes the place of the old represents a startling difference. Brick walls take the place of those of wood; heavy brick walls take the place of those that were lighter and inferior in quality and oftentimes steel beams and columns are used in place of inferior structural material. The work of the "honest" bricklayer of olden times, and the "honest" old carpenter, does not show up very well when it comes to the time of demolishing his work. It sounds all right for a romance, but does not bear the analysis which comes from demolition.

CENTRALIZATION OF POWER.

In this city at this time two enterprises are now under way, which, because of the ideas involved illustrate an interesting fact. Power can be furnished to small manufacturers at a cost which will enable them to compete with the larger manufacturers only when numbers are brought together within the same structure and power furnished from high grade generating apparatus. No one who has not carefully considered the economical production of power can appreciate the great difference which may be realized between one kind of plant and another. For instance, power from steam, as we know, is made primarily through the evaporation of water by means of coal. Of course the boiler plant which will evaporate the most water per pound of coal is the most economical. The average boiler plant that we see every day in small establishments, often in large ones, will evaporate on the average not over 4½ pounds of water per pound of coal. On the other hand boilers may be so well designed and constructed, so carefully installed, so skillfully managed, that nine pounds of water may be evaporated from the same pound of coal. Here the cost of fuel is exactly cut in two. One is evaporating twice as much water for the pound of coal. Now this relates to the boiler. Now as to the engine. An ordinary engine requires the evaporation of about 45 pounds of water per horse power hour. Now, with the boiler, that would be evaporating 4½ pounds of water per pound of coal and the engines that require the evaporation of 45 pounds of water per horse power hour, there would be required the consumption of 10 pounds of coal per horse power hour. Now, take the case of the compound condensing engine operating under the most favorable circumstances and we might expect a horse power from evaporation of 15 pounds of water per horse power hour. Now, with the boiler which would evaporate 9 pounds of water per pound of coal and this high grade engine, we have a horse power from 1 2-3 pounds of coal, whereas before we had a horse power with a lower grade boiler and engine from the use of 10 pounds of coal. Here is the milk in the cocoanut. You may express this in terms of pounds of coal, or in dollars or in thousands of dollars. It may be 1 2-3 dollars as against 10 dollars. It is pounds of coal or dollars, just as one cares to put it. This is the logic which developed the central power plant for small manufacturers.

TRUSTS.

The trust problem is taking on new conditions. Said one who was at a time embarrassed through lack of competition: "Some months ago we bought two special machines, the prices for which were startingly high." "You will have to pay this price if you want them," said the agent. "We now control all of this business. We have been doing business for nothing long enough; now we are asking a small profit." This was the condition about 18 months ago with respect to a particular industry. Now, however, comes a time when we wish to buy more of the same kind of machines and find competition strong, indeed. New manufacturers have gone into the business and are advertising that they are outside of the trust. Now, this particular trust was originally very strong; they started in with unlimited capital and bought up everything in sight. They organized their business on an entirely new basis. Their working force was cut down, nearly all of the traveling salesmen discharged, the manufacturing methods centralized, and, altogether, the cost of doing business greatly reduced. This scheme naturally threw out a number of brainy men, not all of the best could be retained. Among these brainy men are inventors, engineers of a high order of development, mechanics, even financiers and salesmen. What did they do but get together in different parts of the country and the result is new manufacturing establishments. They are carrying no dead load of old patterns or old ideas with them. Much thought and many new ideas which have been suppressed for years now find expression, and the result, as said before, is a decided competition. The two machines, similar to those which were purchased some months ago for $9,000, will be bought for $7,000, and I have no doubt will present a fair profit to the makers."

PUMICE BRICKS.

For many years a brick made chiefly of pumice, in small pieces cemented together, has been in use in that part of Germany bordering the Rhine, and we now notice that it has found its way to England, says The Stone Mason. The pumice is the product of some ancient Tertiary volcanoes, situated for the most part near Andernach and the Laacher See. The sections, as seen in the various pits, show the pumice to be in pieces, varying in size from mere grains to lumps some four inches across. It occurs in layers, but is frequently interrupted by small lenticular patches of more solid fragments of lava. The bricks are made from screened pumice, the larger pieces being broken to pass through a sieve having about one-half-inch meshes. These screened pieces are then covered by a thin coating of cement, and the brick is molded. It will be observed that the cement is not mixed with the pumice, so as to form solid cement blocks, but, by the fragments being coated first, the brick is obtained by these coatings adhering to one another. The result is a very light and vesicular brick. Although used largely even for exterior walls in Germany, it is not very strong. These bricks seem specially adapted for light partition walls, for which purposes they are now being used in England.

A BRICK MANUFACTURER COMMITS SUICIDE.

The body of William Meinert, a wealthy brick manufacturer, Evansville, Ind., was found in a pond near Babytown, March 24. Meinert told some friends several days before, he was tired of life and wanted to die by drowning. He bade his wife good-bye, went immediately to the pond back of the house and threw himself in.

Written for The Clay-Worker.

GUS'S FUN IN FISHING.

By T. W. Carmichael.

I yust have got von greatest joke
On Katerine, mine frow.
She dond can see de fun dere be,
Nor ven, nor vere, nor how,
Ve gets amusements all de day
In fishing in de stream;
For Katerine she dond see dot keg
Dot goes oud mit de team.

Yacoob, Fritz und Bill und me,
Ve takes some lines und hooks,
Und bragging big we hire von rig
Und start oud for dos brooks.
Katrina says ve vont catch not
Von fish in all de stream;
But she dond see dot keg of bait
Dot goes oud mit de team.

Ve finds von littlé fishermans
Dot has some fishes caught.
Ve makes dis youth's acquaintance
Und buys from him de lot;
Ve den comes home, und Katerine
Says ve great fishers seem;
But she for once dond see dot keg
Dot goes out mid de team.

I told Katrina come along
Next time ve goes to fish.
Says she to me, Gus, dond you see,
To fish I haf no wish;
You haf goot luck, but veres de fun
In fishing in de stream;
Oh, Katerine, she dond see dot keg
Dot goes oud mit de team.

Written for The Clay-Worker.

THE FIVE STAGES OF BRICKMAKING.

BIRTH.

Deep, blue sky and clouds of fleecy white,
Soft breezes, bearing incense of the spring,
The meadows green, a flood of mellow light,
The songs of brooks, and birds upon the wing,
Light sounds of happy toil upon the slope,
Where busy workmen gather in the clay.
A hearty cheer that speaks of joy and hope,
"First bricks out." It is the opening day,
And summer, with her train is ushered in,
And summer's toil and glory now begin.

YOUTH.

Soft sky and deepening shades of summer green,
Warm winds that whiten till the brickyards gleam,
Long, level rows of brick and hacks between,
And arches rising as in fairy dream.
A song of birds and songs of happier men,
The kiln fires shining 'neath the starry dome;
The watchers' voices echoing from the glen,
With music laden notes of hope and home.
And summer's works and hope are on the way,
And promise fills her distant closing day.

MANHOOD.

A sky of brass, a breath of dessert heat,
A silent, sweetening hive of vim and grit,
A dreamy note of wood birds in retreat,
A tree-toad's croak beyond the empty pit.
A gust of wind, a rush of darkening cloud,
And shouts from men to "weather up" with haste.
The lightning's flash, the thunder loud and long,
The busy hive is now a withering waste.
And summer's force and fury now content,
And hope and disappointment wait the end.

AGE.

Clear skies and bright, and breezes brisk and strong,
And crickets chirping in the yellow grain.
The night's alight with kiln fires and their song
Alone of all the summer songs remain.
Gone are the toilers from the clay hill's side,
The sweep horse rests from endless, weary round.
Gone are the strikers, vacant yards and wide
Reaches every kiln side's slightest sound.
And ghostly shades like some fantastic fear
Sits nightly by the last kiln of the year.

DEATH.

Gray clouds and clod—a sheen of withering frost,
Dismantled sheds and arches dark and still;
No sun, no sound, no promise, even its ghost
Is hid in sullen darkness on the hill.
The springtime's jay, the glorious summer's moon,
Their songs of hope and cheery sounds have fled.
So long to come, to pass, alas, how soon,
Here summer's hope and promises lie dead.
How like unto man's life these scenes portray,
Man lives, he hopes, he toils—he's passed away.

B. J. D.

TABLE OF CONTENTS.

Brick Pavements in Greater New York 335
Button-Hole Talks 338
The Denver Pressed Brick Co.. 339
Modern American Front Brick 340
China Workers Welcomed to New York 342
The Chicago Situation 343

THE OHIO ASSOCIATION.

Reports of Members 344

SECOND SESSION.

President's Annual Address... 346
Construction of a Modern Clay-Working Plant 347
Experience and Observation of A Clayworker 349
Hollow Blocks 351
Questions for General Discussion 353

THIRD SESSION.

Chemical Reactions Occurring During the Burning of Clay-wares 354

FOURTH SESSION.

A Success in the Manufacture of Tile 357
The Shrinkage of Clays 358
How to Figure the Cost of Ware 359
Washing of Clays for Tile and Brick 360
Best Means of Promoting Sales of Tile 360
Hollow Block vs. Frame Houses 361

FIFTH SESSION.

Benefits of Tile Drainage 362
The Practical Application of Science to Clayworking 363
Reports of Committees 365
Election of Officers 365
List of Members 365

Some Costly Bits of Experience 366
Two New Machines 367
By the Light of the Kiln Fire.. 368
From Across the Border 368
Does the Berg Press Infringe, Etc 368
Jas. Prangley's Brickyard Destroyed by Fire 368
The Grath Furnace a Fuel Saver 370
Brickyard Boiler Explosion 371
A Brick Manufacturer Commits Suicide 373

CORRESPONDENCE.

Information Wanted About Burning Brick With Lignite . 365
A News Note From Holland.. 369
A Kiln in Continuous Operation for Thirty-four Years 369
A Rumbling Sound 369
Good Advice—A Convention Echo 369
Introducing Brick Roadways in England 370
A New Location for Fire Clay Manufacturing 370
Brick Making at Grand Forks, N. Dakota 370
Among the Pittsburg Clayworkers 370
Starting in a New Territory 371
The New York Brick Market.. 380
Pacific Coast News 382
St. Louis Notes 384

EDITORIAL:

Current Comment 372
Brickyard Statistics 372
Building Prospects 372
Smaller Buildings Prevails in the West 373
Centralization of Power 373
Trusts 373
Pumice Bricks 373
Editorial Notes and Clippings. 376

MISCELLANY:

Following Up 366
The Force of Example 367
A Brickmaker Robbed 370
A Pretty Calendar 371
A New Catalogue 371
A Good Ad 371
Fight With a Burglar 371
Growing Pottery—A Fairy Tale 371
At the Paris Exposition 371
Gus's Fun in Fishing 374
The Five Stages in Brick Making 374
A Bank Director 382

Index to Advertisements on Front Inside Cover Page.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

SAVE THE DROPS

OIL AT HALF PRICE.

That's what we guarantee you.

THE CROSS OIL FILTER

Saves half your oil. That's how we do it. Used by the largest Brick and Tile Yards in the world.

Catalogue 43 tells the Story.

The Burt Mfg. Co.. AKRON, O. U. S. A.

Largest manufacturers of Oil Filters in the World.

RAYMOND

BRICK MACHINERY

Where it is Used.

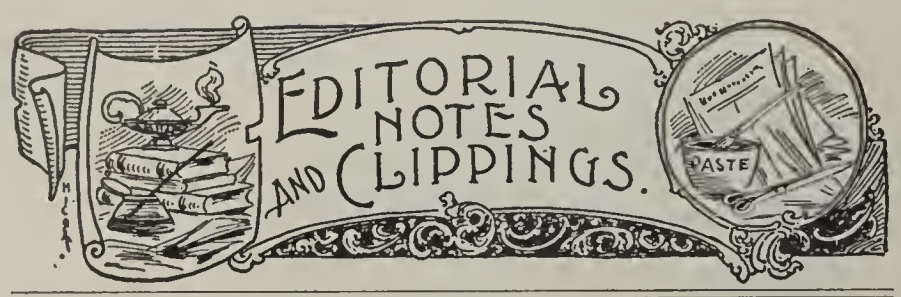
In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

RAYMOND BRICK MACHINERY is now used and in daily operation the world over. Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine.

Our great success has not been obtained without merit. Buy Raymond's and you get the best.

The C. W. RAYMOND CO.

DAYTON, OHIO, U. S. A.



A brickyard is wanted at Oldtown, Me.

A brickyard is wanted at Pocahontas, Ia.

E. J. Gamble will establish a brickyard at St. Maurice, La.

C. L. Genis will put in a new brickyard at Collinsville, Tex.

G. B. Stanford will establish brick works at Lake Charles, La.

Carl Call has opened up a new brickyard at Soda Springs, Idaho.

E. O. Bransford has established a new brick plant at Mullins, Ga.

J. A. Nelson writes he is putting in a new brick and tile plant at Marion, Mich.

A. Schwartz and Joseph Gessen will open a brickyard at St. Martin, Minn.

A new brick yard has been established at Patagonia, Ark., by Wm. T. Powers.

Mills & Howe is the name of a new firm that will locate a brick plant at Sullivan, Ind.

John W. Noble, W. L. Jones and N. S. Perkins have started a brickyard at Anniston, Ala.

The Webster Foundry Sand Co. has purchased the brickyard of Murrell Dobbins, at Florence, Pa.

The Wardell Brick Co. has been incorporated at Seattle, Wash., by J. Gourley and L. A. Dyer.

E. Hartman contemplates making a number of improvements in his brick plant at Ashland, Wis.

J. E. Thompson, Madison Lake, Minn., writes that he contemplates establishing a brick plant at Oliver, Ia.

T. Dunn, a brick manufacturer of Portland, Ore., contemplates the erection of a brickyard at Sumpter.

James Anderson is at the head of a new company that is erecting a large steam brick plant at Albina, Ore.

Gaston & Poyner, Athens, Tex., are in the market for machinery for making roofing tile of the French style.

E. W. Face & Sons, Norfolk, Va., are in the market for a steam shovel. Would prefer to purchase a second hand one.

The Swift & Campbell Brick Co. is a new firm organized, as the name implies, for the manufacture of brick, at Ottumwa, Iowa.

The Duke Brick Co. has been organized to manufacture brick at Anniston, Ala. J. H. Duke is president of the company.

George and William Damhorst have leased a plat of ground at Quincy, Ill., on which they will erect a modern brickmaking plant.

The Bettsville (O.) Brick and Tile Co. has been incorporated by J. F. Shaull, O. Zeiss, G. S. Flanders and others, with $10,000 capital stock.

The firm of Harrington & Bunce, of Rudyard, Mich., has been dissolved. J. D. Bunce will continue the business, S. W. Harrington retiring.

V. D. Palmer, of Barryton, Mich., advises us that together with R. C. Palmer, of Tipton, Mich., he will establish a brick and tile plant in that section.

The Baltimore (Md.) Brick Co. are evidently firm believers in expansion. At any rate, they have recently established a branch office at Havana, Cuba.

John Pickart, of Benton, Ia., has purchased the brickyard formerly owned by Peacock Bros., at Norway, Ia., and will put same in operation at once.

Stiles & Hart have purchased the brick plant of Philip E. Williams & Co., at Weir, Mass., and will operate the plant to the fullest capacity the present season.

C. L. Smith has moved from North English, Ia., to Mason City, Ia., to take charge of a large brick and tile plant which will soon be located at the latter place.

The New York Legislature has passed a bill appropriating $15,000 for the establishment and maintenance of a state school of clay working and ceramics at Alfred University.

J. Wheaton Stone, secretary of the Eastern Machinery Co., of New Haven, Conn., writes that their business is good in every respect, very much better than for the past two or three years.

Charles Hess and W. P. Johnson are erecting a new and modern brick plant on the site of the old yard at Indianola, Ia. They expect to have same in full operation by the first of May.

The Iowa Brick Co., Des Moines, Ia., expect to make some extensive improvements in their plant, thereby increasing their capacity. They will also build large additions to their dry sheds.

The plant of the Genesee (Pa.) Clay Manufacturing Co. has been purchased by W. I. Lewis, of Coudersport, Pa., and L. S. Anderson, of Wellsville, N. Y., and will be started up in a short time.

G. G. Nicholson has purchased the brick and tile plant of W. J. Reed at What Cheer, Ia. He will make the necessary improvements and operate the plant to its full capacity the coming season.

L. L. Lieber, Monroe, La., advises us that he expects to establish a brickyard at that point in the very near future. Mr. Lieber asks for The Clay-Worker, as he is looking up machinery, etc.

C. K. Sherman, Kansas City, Mo., is at the head of a company that is being organized to establish a large paving brick plant at Leloup, Kan. A number of St. Joseph, Mo., capitalists are interested.

The firm of Jakeman, Couch & Jakeman has been organized at Suffolk, Va., and will establish a new brick and clay product plant near that city. They expect to be in operation by the first of June.

C. J. Holman, the well-known brick manufacturer of Sergeant Bluff, Ia., writes that he has sold all the brick he had in stock, and is taking orders for the spring stock, and expects another good season.

A cave-in at the clay bank at the Ittner brick works, Belleville, Ill., caught Joseph Asquey, a laborer, and his leg was so badly crushed that amputation was necessary. He was also injured internally.

The Central Brick Co. is the name of a new concern recently organized at Macon, Ga., and of which D. W. Jeter is general manager. They will put in a large plant, fully equipped with modern machinery and appliances.

Fire damaged the plant of the W. C. Hill Brick Co., at Seattle, Wash., to the extent of $3,200. The flames started in the dry house and was caused by the overheated steam pipe coming in contact with the woodwork.

The Fultonham (O.) Brick and Tile Company and the Fultonham Clay Manufacturing Company have consolidated and hereafter will be run under one management. Arthur Hoover has been made manager of both works.

E. M. Coats, W. F. Cook and W. H. Selvey have organized a company that has purchased the brick plant of Beston & Kelly, on the Chicopee road, Springfield, Mass. The plant will be enlarged and additional machinery put in.

Fifty men, employed at Park's Brick Works, Brady's Run, Pa., went out on a strike recently. They are only paid once a month and have made a demand for pay every two weeks. The difficulty is probably adjusted by this time.

Eba Scarborough has purchased from John Elliott the Choccolocco Brick Works, at Easton, Md., and will consolidate it with the Alabama Brick Works at the same place. This will give Mr. Scarborough a daily output of 35,000 brick.

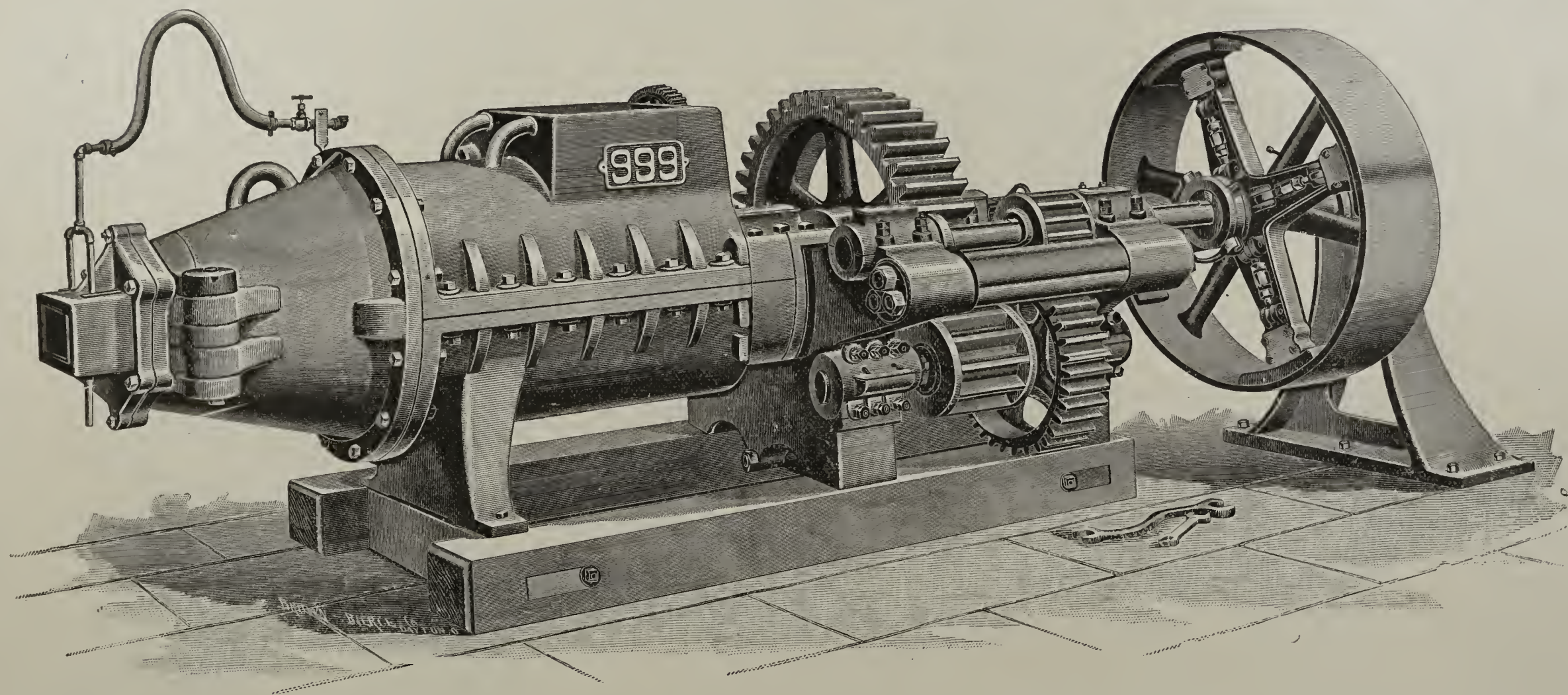
The death of Robert Coward, one of the pioneer brick manufacturers of Pittsburg, Pa., occurred at his home there on the 4th of this month. Mr. Coward was 76 years old, and had spent forty years of his life in the brick business.

Wm. B. Lowe, a member of the Chattahoochee Brick Co., died at his home in Atlanta, Ga., April 5. Mr. Lowe was 61 years old, a native of Georgia, and had been prominent in the business interests of Atlanta for nearly forty years.

The Burt Manufacturing Co., of Akron, O., manufacturers of the Cross Oil Filters, recently entered their twelfth order from the National Steel Co., twelfth from the American Tin Plate Co., ninth from the American Steel and Wire Co., seventh from the Federal Steel Co., fourth from the Pittsburg

(CONTINUED ON PAGE 378)

Raymonds Large Capacity Brick Machine.



"Looks are nothing, behavior is all," is just as true of brick machines as of mortal clay. The above cut shows that our 999 machine is a good looker, and in operation it is even better than it looks. The very embodiment of strength, it is the machine for those who want to increase the capacity of their plant, while for the making of paving brick from tough shales it is par excellence. Its great power makes it possible to make good pavers from shales that can not be worked successfully in ordinary auger machines. This machine has many good points which we will gladly enumerate in detail to every brick maker who is interested. Address,

We also make a variety of superior Represses, Cutting Tables, Clay Grushers, Pug-Mills, Tempering Wheels and all kinds of Brick Yard Supplies.
Write for new Catalogue.

The C. W. Raymond Co.,

Dayton, Ohio, U. S. A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

Plate Glass Co., fourth from the Calumet & Hecla Mining Co., and duplicate orders from the Cambria Steel Co., Diamond Match Co., and National Cash Register Co.

The Riverside Fuel and Supply Company has purchased the brick plant of The Herbrand Company, at Fremont, O., and will enlarge same, putting in extra machinery.

The Standard Stone and Brick Co. has been incorporated to manufacture brick and building material, at McClainville, O. The incorporators are A. Neff, A. Klotz, G. Brown, C. N. Dickens, A. Froll and T. Neff. The capital stock is $50,000.

Jacob Stillwaugh, an old and highly esteemed citizen of Hamilton, O., died at his home in that city recently. Mr. Stillwaugh was one of the pioneer brick manufacturers of Hamilton, but retired from active work some five years ago.

A. J. Spotts has leased the brickyard of Speck & Fagen, at Carlisle, Pa. Mr. Spotts will make a number of improvements in the plant, increasing its capacity, and, in addition to common brick, will also manufacture paving and pressed brick.

Cyrus J. Linn has leased three acres of land from Samuel W. Black, of Homestead, and will erect thereon a modern brickmaking plant of 50,000 daily capacity. Modern machinery will be installed and the plant be up-to-date in every particular.

The Patton Vitrified Brick Works, Cloverport, Ky., which have not been operated for several years, will, in all probability, run to fully capacity this season. The operation of this plant will give employment to from seventy-five to one hundred men.

The employes of the T. B. Townsend Brick Co., Zanesville, O., were made to rejoice recently by an increase in wages of 15 per cent. The firm stated they are overwhelmed with work and the good price secured warrant them in making the advance to the men.

The Garfield (Pa.) Fire Clay Co. is enjoying an unusual season of prosperity. All departments are running to full capacity. They have recently advanced the wages of their employes ten per cent. The increase affected over one hundred men and boys.

The employes of the Mount Savage Fire Brick Works, Mount Savage, have been granted an increase of 10 cents a day, while the wages of the employes of the Fallston Fire Clay Co., at Brady's Run, near Fallston, Pa., have been increased 10 per cent.

In a recent letter, renewing their subscription, Maxted & Knott, Hull, England, say that business is not quite so good with them as it was last year, prices having a downward tendency, and that the difficulty they are having in getting fuels is causing serious alarm.

Edward Morse, secretary of the South Bend, Ind., Brick Exchange, has purchased a half interest in the brickyard of the late John H. Shank, and will manage same in connection with his brick exchange duties. Mrs. Shank will hold her half interest in the yard.

The Empire Lumber and Mining Company, of Bristol, Tenn., will operate a brick plant in Shady Valley, Johnson county, in order to manufacture all the brick required in the construction of a large lumber plant in the valley. Mr. Van Alstine has the work in charge.

The Guernsey Brick and Construction Co., Cambridge, O., are in the market for two new double-die repress machines, and will be glad to receive catalogues, etc., from reliable manufacturers. They say the prospects are good for a flourishing business in building and paving brick.

Work is soon to commence on the new brick plant of our good friend, F. H. Eggers, of Cleveland, O. The plant is to be located at South Brooklyn, one of Cleveland's suburbs, and will be one of the largest in that section. Mr. Eggers will turn out both paving brick and fire brick.

D. A. Layton is making a number of improvements at his brick plant at Marion, S. C., with a view of increasing the capacity of same, putting in new machinery, erecting new kilns and a new steam dryer. Mr. Layton now makes an excellent quality of brick, and when the new additions are made he will have the most complete plant in this part of the State.

A plan has been consummated by which the Reid Brick Co., recently organized at Charlotte, N. C., will control the output of the several yards at Charlotte, N. C. The manufacturers interested state that while the combination will enable them to maintain a uniform price for brick, it is not made for the purpose of forming a trust, but the consolidation is merely for the purpose of self-protection and for the general advancement of their industry. The firms entering into the agreement are the Reid Brick Company., F. W. Shuman & Bro., W. H. Houser, J. Asbury and T. E. Asbury.

J. C. Steele & Sons, Statesville, N. C., report that they are overrun with orders, having recently taken orders for four brick machines in one day. They are constantly increasing their force of workmen and are now working extra time, and are shipping quite a number of their new represses.

John Reisert, an employe of C. P. Arien's hub and brick factory, Connersville, Ind., met with an accident, April 4, which might have proved quite serious. While taking off a belt, which keeps the machinery in motion, he was caught by it and thrown with great force against a wall, breaking both bones of the left arm.

The employes of the mammoth plant of the Reese-Hammond Fire Brick Company, Bolivar, Pa., have again been made the beneficiaries of "good times," the board of directors of the concern having decided upon granting another advance of from 5 to 15 per cent. in the wage scale. This is the third advance made by this company within a year.

T. C. Lundy, superintendent of the Garden City Co., Farmingdale, L. I., writes that the business outlook for the coming season is very bright. They have booked some nice orders and to quote Mr. Lundy, "see nothing ahead but push, and I hope lots of beautiful brick to bring elegant dollars, thereby causing broad smiles to beam on the faces of the owners of our works."

Williams' Patent Crusher and Pulverizer Co., of St. Louis, Mo., write that trade is good with them, as they have all they can handle, but expect quite an increase when spring trade is fully opened up. They have recently placed an order for several new planers and have installed in the last six months quite a number of new and improved tools, which greatly facilitates their work.

G. E. Luce and J. A. Taylor, formerly of Brazil, Ind., have organized the Pittsburg Brick & Pipe Co., Pittsburg, Kans., and will erect a plant at that place for the manufacture of hollow tile and other clay goods. Both Mr. Luce and Mr. Taylor are experienced clayworkers, and the success of the new venture is assured. Our Hoosier friends take with them our best wishes for their success.

The Beatty Fire Clay Co.'s plant, at Magnolia, O., was totally destroyed by fire recently. The loss on the plant is estimated at $60,000, on which there was $20,000 insurance. The work of rebuilding the plant will begin at once, and the company expect to have the works in operation again within a month. As all the machinery, engines, boilers, etc., were destroyed, an entire new equipment will have to be purchased.

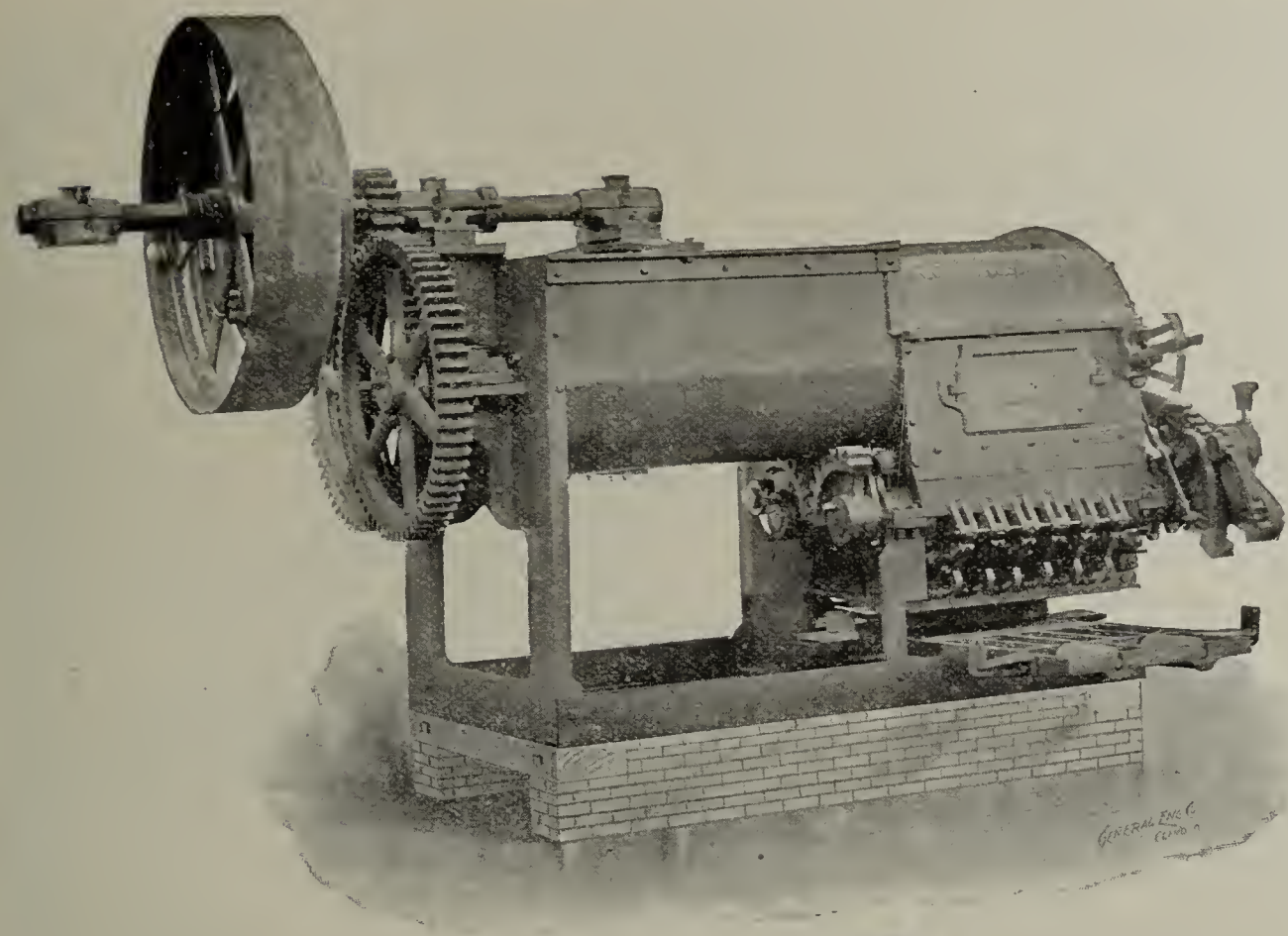
The District Brick Co., Washington, D. C., has been incorporated with a capital stock of $25,000. The officers are: Edward R. Diggs, of Baltimore, president and general manager; A. J. Stanford, of Washington, vice president and treasurer; Bernard J. Cain, of Washington, secretary. These officers, with Lloyd A. Douglass and F. Walter Brandenburg, constitute the board of directors. James R. Caton is the local agent.

The Schuylkill Valley Clay Manufacturing Co., of Philadelphia, Pa., has commenced work on a large plant to be erected at Shoemakersville. Land has been purchased from F. Leonard Reber, and it is expected that the plant will be in operation in the course of a few months. Eighty men will be given employment. Their output will consist of plain and ornamental terra cotta, chimneys, etc. The company has enough orders on hand now to keep them busy during the summer.

The demand for brick at Baltimore, Md., is exceptionally good for this season and prospects are so bright that several of the Baltimore brickmakers are building additions and otherwise improving their plants. Jacob Klein is erecting a large plant near Herring Run, close to Baltimore, where he will manufacture hollow building brick. The Adams Co. will enlarge their plant at Canton, a suburb of Baltimore, and the Harman-Judik Co. will make a number of improvements at their plant at Arlington, Md.

AN OPPORTUNITY.

If any of our readers are looking for an opportunity to acquire an interest in a well equipped brick and tile plant, they will find it to their advantage to investigate the works advertised by "J., care Clay-Worker," in our For Sale, Wanted, etc., columns. It is a summer plant, with ample power, plenty of drying room and two 20-foot round down draft kilns. Plant is in good running order, and offers a good opening for any young man who wishes to go into business for himself.

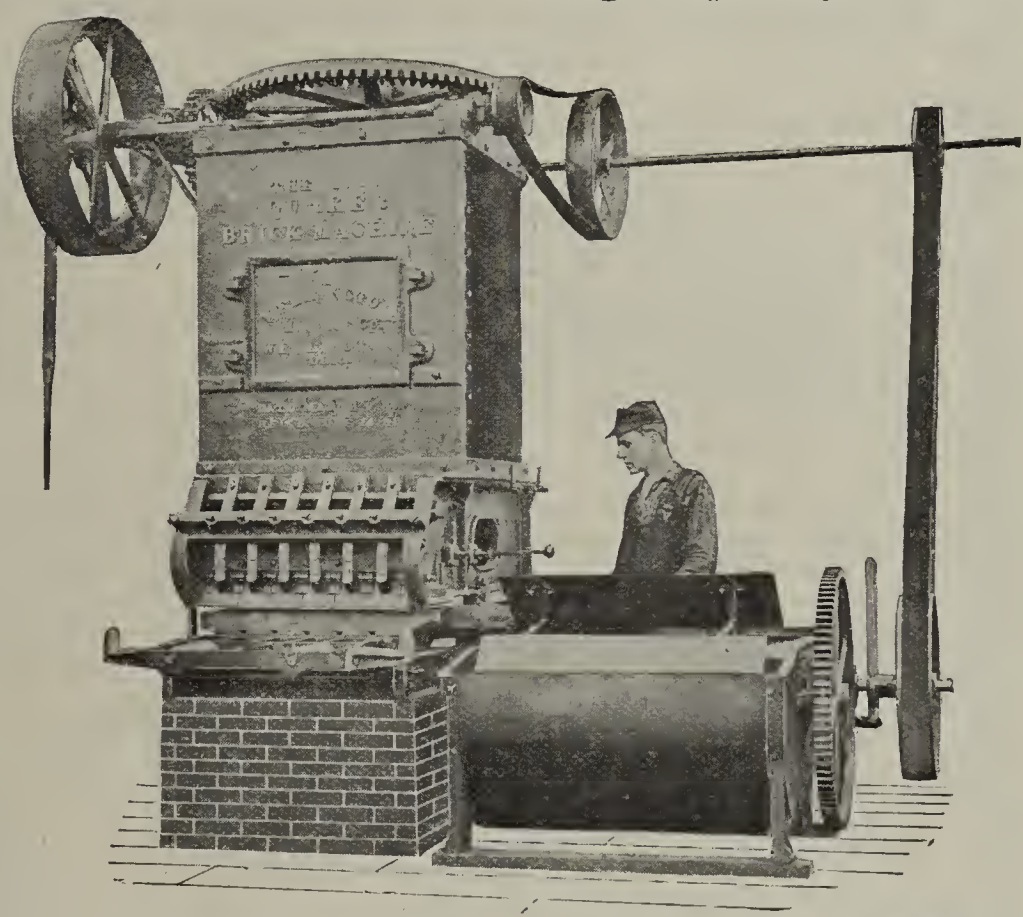


Over 75 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

Long acknowledged the best for small and average sized yards.

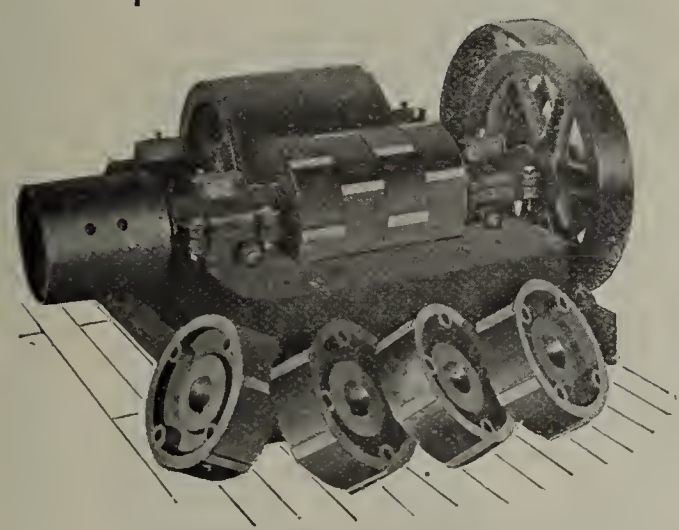


FOR 1900

We have added several new machines to our line.

Send for our 1900 Circulars.

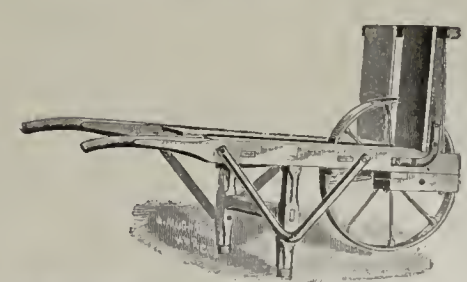
Our mould-sander is the best, simplest and cheapest.

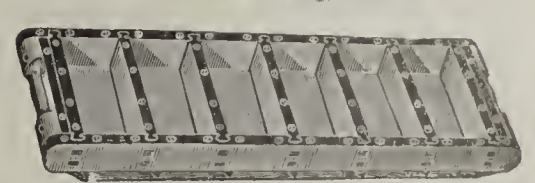


TWO Styles of Disintegrators, Solid rolls with inserted cutting bars and cutting roll made of hard sections.

MOULDS, TRUCKS, BARROWS,

and all other Supplies.





Nothing runs easier than our BALL-BEARING BARROWS AND TRUCKS.

The WELLINGTON MACHINE CO.,

WELLINGTON, OHIO.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

LAST YEAR was not a money maker for the Hudson river brickmakers. As in other lines of business improved prices meant increased expenses. Labor, usually the first to feel the reduction and the last to be raised, was the first to demand an increase. As all the manufacturers were anxious to get men the demand was promptly granted. Before the season closed another advance was asked for and received, as the manufacturers could not afford to let the men go during the busy season. There was also an advance in the price of wood, and even they good dry wood was scarce.

Sales were active enough, with the prices in advance of those of the previous year. However, the summer months brought the same old story of former years—rates fell off and did not react until late in the fall. Then there was not a great raise, simply an eighth or a quarter of a dollar per thousand at a time. The balance sheets of the brickmakers were better than in 1898, but still far from what was promised early in the spring.

The improvements in all lines of manufacturing so prominently set forth by all newspapers is discouraging to the brickmaker. Last year the demand for his product was good, but still the prices did not advance as they should. There seems to be something that affects the trade, always to the manufacturer's loss. The material men will say during the winter, "Next month the price of brick will be 'so and so,'" and sure enough it becomes a fact. It would be a good thing if the material men would change places with the manufacturers of common brick. Possibly the manufacture of common brick on tidewater would become a money-making business. The material man can force prices by simply keeping off the market for a day or two, when presto, change, there is a tumble in prices satisfactory to him, and all is serene.

—The Outlook for 1899—

Was large. The demand was the same. The yards molded late and when the amount of stock was taken the last of December there was only about 19,000,000 of brick more under the sheds than the previous year. The Haverstraw yards had 94,970,000 brick the year before. The same yards had 76,000,000, so that the extra million difference would, if the ice king allowed shipments, keep the market supplied. The weather was not of the first-class sort. Building was retarded, so that last season's stock will last until new brick are on the market.

To judge from past experiences, the recent spurt will hardly subside in one year, still to expect a boom year in the brick trade during presidential year would be a departure from past experiences. If the present summer, however, is not as good as last, it will be a great disappointment to many manufacturers. Of one thing we may be sure, and that is, the manufacturer will do his best to help make low prices.

—The Building Outlook.—

As we look over the list of projected buildings and compare this year with last, it shows, according to the first two months of 1900, that something is wrong. It is a question whether speculators are holding off on account of the presidential election, or whether more buildings were erected last year than were needed. It is always expected that more plans will be filed the first quarter of the year than in any other single quarter. The following comparison is rather depressing on the outlook for an active demand.

From January 1st to February 24th, 1899, there were 627 plans filed. For the same date of the present year only 164, a falling off of 463 plans. The cost of 1899 plans were $13,371,904; for 1900, $5,858,570. The Brooklyn office for the same time in 1899, 456 plans; in 1900, 337, a falling off of 119 plans. The cost of the 1899 plans was $2,066,865; for the present year, $1,668,215; a difference in cost of $398,650. If this same average holds good for the rest of the year, what will the harvest be for 1900?

Such a falling off in the beginning is not encouraging to the men that make brick. There may be plans held in reserve from last year that were not built on, and they may be brought out this year. If not, the outlook is not bright at present. It is not well to cross a bridge until you come to it, and a marked and sudden spurt may develop at any time. There will certainly be no falling off in output, as each manufacturer will try to make as many brick as possible.

Many men have left other lines of business to engage in the brick business. There seems to be some great attraction in the brick business. Men invest their money, without taking any time to look over the field to see the many wrecks that strew the shore. All that is required is a year or two of good times and then the farmer will leave his plow and men in all lines of trade will embark in the manufacture of brick. They will lease yards that a man of experience would not take hold of. For a year or so they will make some money and then a slack time will come, and the money they have made, together with what they put into the business, will melt away, and the farmer will return to his farm—or I may say will work on his old farm as a tenant.

Advertisements of yards to lease can be seen in papers in towns in the vicinity of good clay deposits. The past three years there have been more yards to lease or offered for sale than at any period for many years, and at terms too that would be considered very reasonable, but still there is no call for them. The man with capital seems willing to take risks in other lines, but he draws the line at brickmaking. It is too risky, so that those who do embark in the business are those of limited capital. In fact the capital is far too small in many places to warrant success.

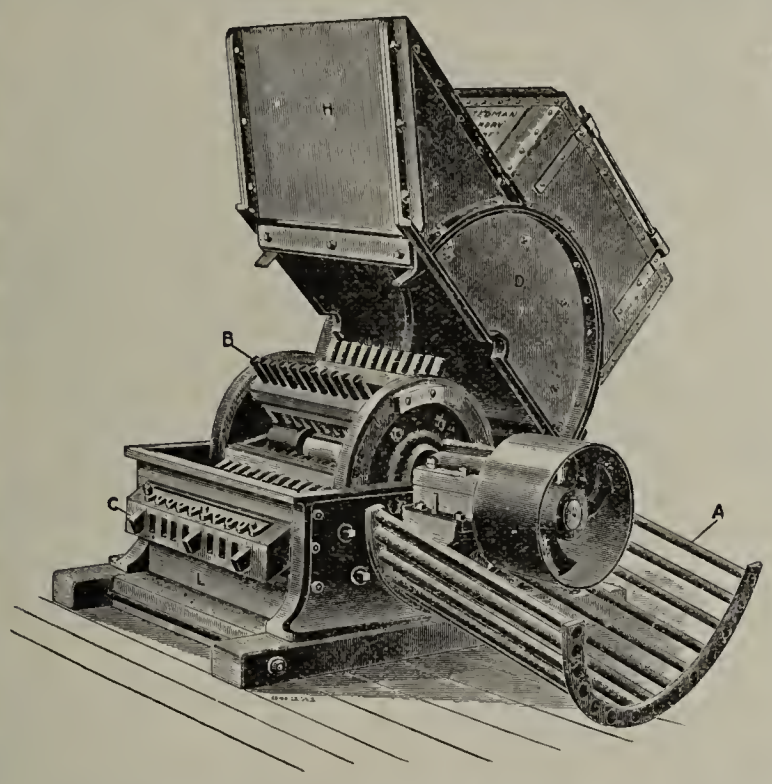
—A Venture That Didn't Materialize.—

The American Brick Company, that was going to completely revolutionize the trade, and no doubt might have done so, seems to have failed to materialize at the last moment, although options were taken on a number of plants and an advance made. There probably were some men in the movement that lacked "sand" to carry it through. Various stories are going the rounds as to why the scheme failed, but no one really knows the cause. It is said that Mr. Thorn has returned some of the property and expects to keep the balance of the property and carry out his scheme. It may be that his company will develop strength enough to help the market through the other brickmakers getting together. Mr. Thorne is said to have plenty of capital, and it is said that he lost considerable money through the failure of his plans. It is to be hoped that he will be the means of showing some of the manufacturers who seem to have gotten into a rut that the manufacture of common brick on tidewater can be made very profitable, and the material man may become second fiddle, instead of first, as he now is, while other musicians will take subordinate positions. May the season of 1900 be the one that will release the manufacturers from the men who fix the prices for his stock.

—The Market—

Is not of a high order, nor has it been all winter. When the weather becomes settled there will be a change, as the consumption of brick will be larger. The first of the year ruling rates were: Best, $5.50 and $5.75; Common, $5.25 and $5.50; New Jersey, $5 and $5.25; Pale, $2 and $3. The first of March the same rate prevailed, and the first of April will not see much change. If prices would remain as they are, it would be a great surprise to all. A. N. OLDTIMER.

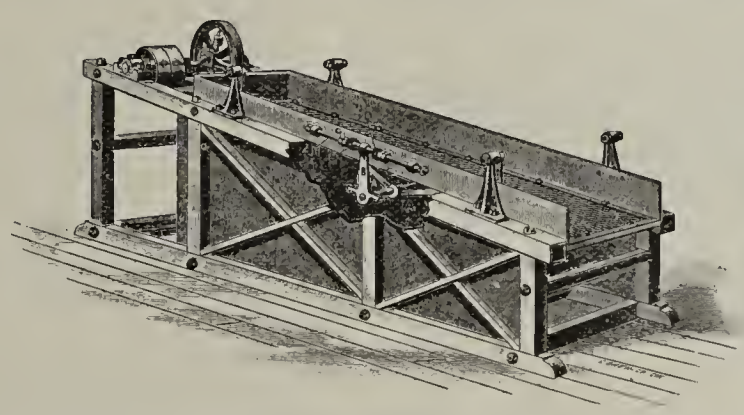
"Gee whiz! I wonder how much they wants fer de pianer?"



STEDMAN'S IMPROVED CYCLONE PULVERIZER.

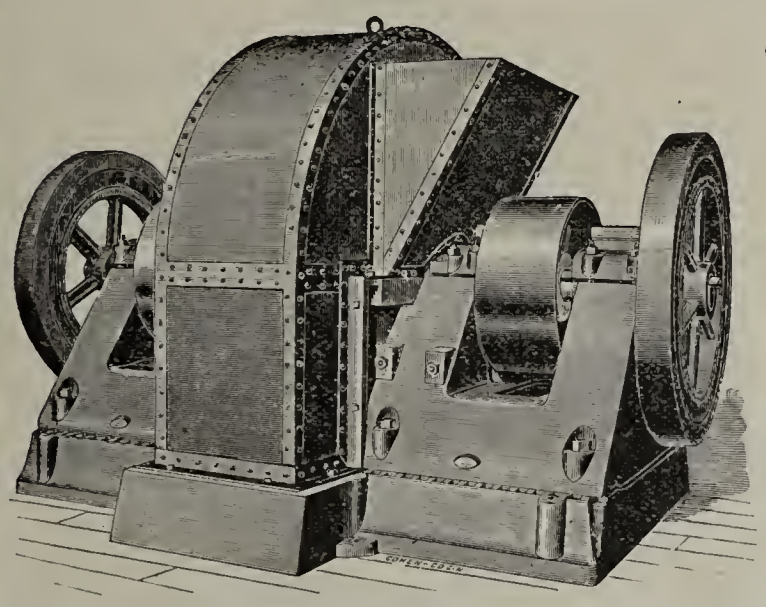
THE accompanying cut illustrates the latest type of Clay Grinder placed on the market by us. We have been engaged in the manufacture of Crushing and Grinding machinery for several years and have made Clay Grinding a special study. This new machine known as our Cyclone Pulverizer is the result of practical experience, and in its design we have accomplished the result of making a machine that will pulverize the clay to any fineness desired in a dry or semi-dry condition. It is substantial in construction and the grinding parts are constructed in such a manner that it is almost impossible to break the machine by the introduction of any foreign substance and if any parts are broken the manner of replacing them is so simple that the cost of repairs is practically nothing, when the durability of the machine and the work it accomplishes is taken into consideration. Send for circular giving full description.

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.

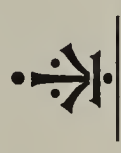


A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR



For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials.

Stedman Foundry & Machine Works,

AURORA, INDIANA.

Written for the Clay-Worker.

PACIFIC COAST NEWS.

THE BRICK AND TERRA COTTA interests are somewhat improved this month over preceding ones and there is no doubt but that the year 1900 will prove a good average season for the clayworking fraternity of California and the Pacific coast in general. Several large building enterprises are being considered in San Francisco and a few weeks more will see the foundation being laid for Alvinso Hayward's new eleven-story office structure at the northeast corner of California and Montgomery streets. This building will be very handsome and will require a great deal of terra cotta and other products of the brickyards. In addition to business structures there are some very costly private residences in course of construction, among which might be mentioned that of J. D. Spreckels at the corner of Pacific avenue and Laguna street. This structure will cost several hundred thousand dollars and the materials are sandstone and terra cotta.

The Steiger Terra Cotta and Pottery Works are supplying the sewer pipe to the San Francisco Construction Company, which is placing a complete sewer system at Belvedere, one of the picturesque summer home suburbs of San Francisco.

Gladding, McBean & Co. report a very good season, with enough orders to keep the works at Lincoln, Cal., quite busy. This firm is furnishing about 4,000 tons of sewer pipe to the government for Honolulu, H. I. These people have already supplied about 3,000 tons for the same purpose, so that the order in question is an additional one. The pipe ranges from six to twenty-four inches.

N. Clarke & Sons have nothing special to report this month other than that they have enough minor work and contracts which aggregate a very satisfactory amount. The works at Alameda, Cal., are running along very smoothly on general work.

R. P. Bradley, superintendent of the clay works at Little Falls, Wash., states that the works are running steadily and the company has plenty of orders, but is experiencing some difficulty in getting out enough clay.

The Los Angeles Stoneware Company has recently built a new kiln at Los Angeles, Cal., with a capacity of 2,500 to 3,000 gallons at a burning. This gives them three kilns, the new one to be devoted to stoneware and the other two to sewer pipe. These works are turning out a considerable quantity of sewer pipe and stoneware of all sizes.

The Steiger Pottery Works at South San Francisco will soon commence the construction of a large addition to its main building to include and inclose the new kilns.

James Curran has commenced the manufacture of brick for a new 250,000 kiln at Kern City, Cal. The work will be hurried to completion as rapidly as possible. The indications are that as soon as this new kiln is out of the way the demands of new buildings will cause the immediate preparation of still another kiln.

Some parties from the East have been in Burton, Wash., recently looking at the brickyards of Bickford & Burrows, with a view to purchasing. Should they do so, they will put in a large plant and manufacture brick on an extensive scale.

Several thousand feet of lumber have been hauled to the brickyards in the west end of Anaconda, Mont., and will be used at once in the construction of an immense shed to cover the brick presses which will make 15,000,000 brick this season. Anaconda weather at periods of the spring and summer is uncertain, but the construction of this shed will make it possible to manufacture brick in all kinds of weather. The molding of building brick will be commenced as soon as the frost is out of the clay, and will give employment to a force of men almost double the number during any year in the history of brickmaking in that section.

Parker & Van Ronk have established a brickyard at Centralia, Wash.

The brickmaking machine at the Holt & Gregg Company's brickyard near Anderson, Cal., has been started on the summer run. The company has also started its lime kilns near Kennett, this State. They are the largest ever built in northern California and it is believed that they can be operated continuously for a year without undergoing repairs.

The Missoula Brick and Tile Works at Missoula, Mont., has started up for the season's run. It is believed that the output of the plant will be large this year. At the works they are turning out 30,000 pressed brick a day, and at the second yard 20,000 sand-faced bricks are being made daily.

Albina, Ore., will shortly have a fine large brick plant in operation, with a capacity of 150,000 brick a day. James Anderson is the owner of the plant and he commenced work on the new yard last fall. It will be a steam affair with a Potts machine, making it one of the finest concerns of the kind in that section.

Some parties are figuring on putting in an establishment at Chehalis, Wash., for the purpose of manufacturing fire clay and brick. If they can find the right sort of clay they will also manufacture pottery.

A brickyard is being established in Genesee, Idaho, by Troutman & Kimball.

The Little Falls Fire Clay Company, of Tacoma, Wash., is operating its works at Little Falls on full time and turning out vitrified brick and sewer pipe, fireproofing and all kinds of clay products. R. L. Manning, the manager of the works, reports a splendid outlook.

First avenue, between Madison and Pike streets, and University street, between First and Second avenues, Seattle, Wash., will be paved with vitrified brick in the near future.

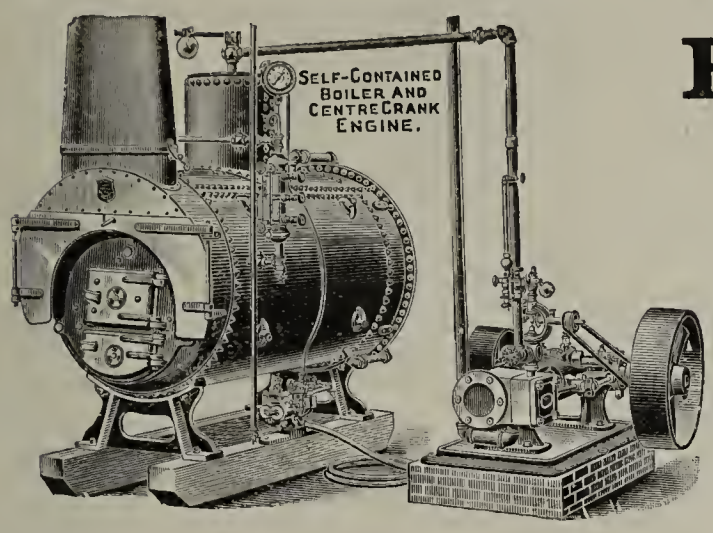
Colonel G. J. Griffith, of Los Angeles, Cal., states that plans are maturing for the erection of a tile manufactory which his company—the Pacific Art Manufacturing Company—will establish on the San Fernando road. The ground has been laid off, the plans are drawn for the extensive buildings and the incorporation papers are ready to be signed. The main factory building will be 570 by 185 feet, and will be constructed of stone and brick. The incorporators of this enterprise are J. P. Bliss and Daniel J. Ryan, of Columbus, O.; Joseph Kirkham, formerly superintendent and ceramist of the Kirkham Art Tile and Pottery Company, of Barberton, O.; Dr. J. C. Marquadt, formerly of Tiffin, O., and G. J. Griffith, W. H. Perry and George Easton, of Los Angeles.

Considerable work is being done at the yards of the Ogden Pressed Brick and Tile Company at Ogden, Utah. New machinery is being put in and the old put in good shape.

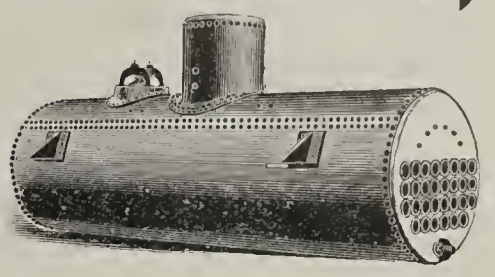
San Francisco, April 5, 1900. SUNSET.

A BANK DIRECTOR.

THE MURRAY IRON WORKS COMPANY,



Burlington, Iowa,

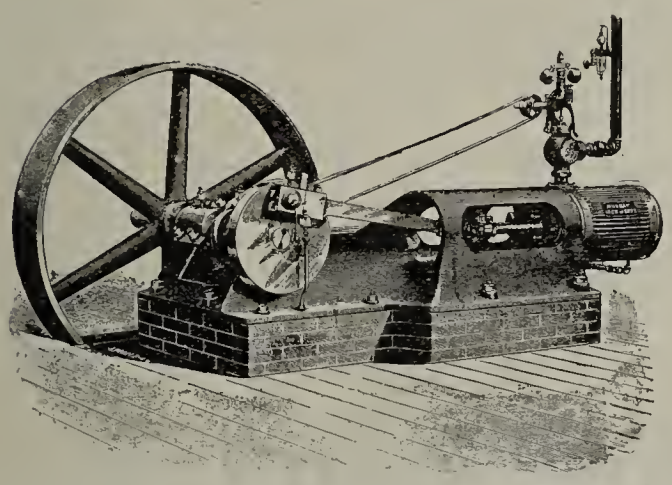


BUILDERS OF

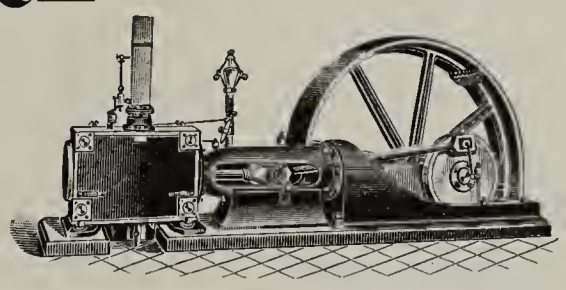
Corliss and Slide Valve ENGINES and BOILERS

For all Pressures.

Send for Catalogue No. 40.



OUR SHOPS are Fully Equipped With all the modern tools and appliances; we employ 400 men, carry thousands of tons of materials and can execute your orders promptly and at the lowest prices.



The PROGRESS BRICK PRESS.

THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick. Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE ON APPLICATION.

ORNAMENTAL BRICK.

We carry a full line of shapes in red color, and will be pleased to forward our Brick Catalogue on application. Liberal discount to dealers.

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. *ST. LOUIS, MO.*

Written for THE CLAY-WORKER.

ST. LOUIS NOTES.

—Missouri's Clay to Be Utilized—A New White Ware Manufactory to Be Established.—

ST. LOUIS is at last going to branch out in a new line of clay goods, or the manufacture of white ware, under auspices that speak well for the future. This was attempted once before by parties who tried to run a two-kiln pottery in connection with a sewer pipe plant some thirty years ago. It is hardly necessary to say that it did not succeed, though some good C. C. ware was made. The Missouri Geological Survey sent an emissary to East Liverpool eight years ago to try and induce some of the successful potters to move from there to St. Louis to take advantage of Missouri's excellent raw material, and secure the magnificent shipping facilities of St. Louis, as well as to save the freight of now shipping the raw material from Missouri to East Liverpool, and then reshipping the finished material back again. For Missouri possesses excellent deposits of ball clay, kaolin, feldspar, flint and sagger clay, while a coal suitable for white ware can be delivered for $1.60 a ton. Mr. Winkle, the successful manufacturer of white ware pottery at Cheltenham, on the western outskirts of St. Louis, which promises to be the nucleus of a large development of this line of clay goods, for Mr. Winkle not only possesses the requisite business ability, but he is an old white ware hand, as this was his old business before going into the terra cotta. He thus possesses the vital essential of experience, combined with ample capital and business ability; hence, the strong assurance of a successful result with the combination of St. Louis's great natural advantages.

Another venture in this same direction is under contemplation by the Columbia Clay Co., a new organization that has just been incorporated with a capital stock of $500,000, and which is said to possess its own kaolin deposits. What their plans are and who is at the head of the concern has not yet been developed.

The Blackmer & Post Sewer Pipe Co. are in harmony with the expansion of the times, as they are building a new shop that will increase their output 50 per cent., or to about 3,000 cars a year. They were formerly the smallest sewer pipe shop in St. Louis, as they run only one press. But when they moved out to Oak Hill they doubled their capacity by erecting two shops, which placed them on a par with the two other sewer pipe manufacturers. With their new, or No. 3, shop completed, they will be the largest sewer pipe manufacturers in St. Louis. They make a specialty of the large sizes of pipe, of from 24 to 36 inches in diameter, with which they have had great success. They will erect 34-foot kilns for the new shop, which is a marked improvement over the 24-foot kilns with which the old shop is equipped.

The Standard Tile Co. is very active and has had to decline some large orders for conduit tile, and for vitrified tile grain elevators.

The brick situation is improving and the outlook is excellent if the Chicago strike does not extend into this territory.

"LOUIS."

WANTED — A 60 or 72-chamber clay press.
MONMOUTH POTTERY CO.,
4 tf d m Monmouth, Ill.

WANTED — Position as superintendent of enameling plant. For particulars Address
4 1 c m OPAQUE, care Clay-Worker.

FOR SALE — One No. 7 Penfield plunger mill. One Penfield elevator. One Morenci, Mich., cutting table. Address
4 3 p BARRED, care Clay-Worker.

WANTED — Competent men to superintend the erection of patent kilns and dryers. Address with full particulars as to experience, references, salary expected, etc.
4 1 d "KILNS," care Clay-Worker.

WANTED — Burners for continuous and up and down draft kilns. State qualifications and wages.
LAPRAIRIE BRICK CO.,
4 1 d Montreal, Canada.

WANTED — Position as superintendent of a dry press brick plant by a thorough practical brickmaker and burner. No. 1 references given. Address
CHARLEY SAINT,
4 1 cm care Clay-Worker.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

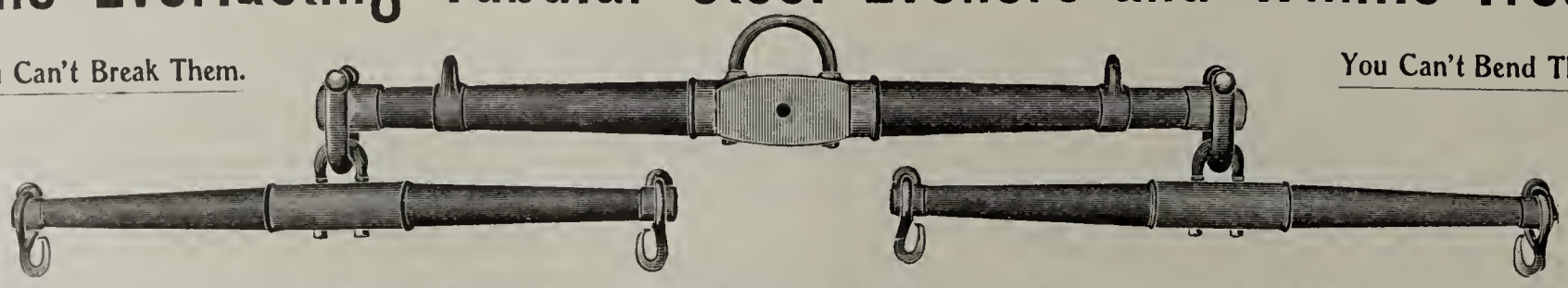
S. G. PHILLIPS, Agent and Patentee, 161 Grand Street, Rahway, N. J.

COLUMBIA, MO.--A New Location for Fire Clay Manufacturing.

Population 6,000; two railroad systems (M., K. & T. and Wabash); midway between St. Louis and Kansas City; abundance of hardwood, also of elm and cottonwood; inexhaustible coal fields; choice building stone; **great fields of fire clay**; seat of University of Missouri, tuition free; also two large female colleges and other schools; sixty miles of gravel roads; healthful and prosperous; excellent location for manufacturing products sold to the people of the growing southwest. Address **SECRETARY, Box 234, Columbia Improvement Club, Columbia, Mo.**

The Everlasting Tubular Steel Eveners and Whiffle Trees.

You Can't Break Them. You Can't Bend Them.



THEY are no heavier than wood wiffletrees and cost no more. You can't afford to be without them.

PITTSBURG TUBULAR STEEL WHIFFLETREE CO., Sole Manufacturers, P. O. Box 480, PITTSBURG, PA.

The Belt for the Brick Yard

Is the one that is not impaired in length or kind of service, when subjected to excessive weather, moisture or dust conditions. There is only one constructed to withstand these without injury, and it is

LEVIATHAN BELTING.

Our customers bear us out in this, and a trial order will demonstrate it to you.

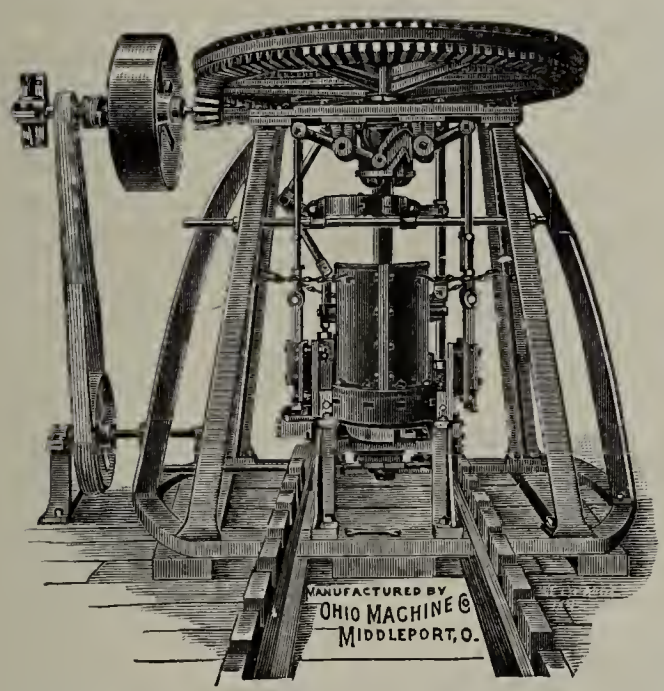
MAIN BELTING COMPANY,

1221-41 Carpenter St., Philadelphia, Pa.

55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.

Write for Samples and Price Lists.

The AJAX BRICK MACHINE,



MANUFACTURED BY THE

Ohio Machine Co.,

MIDDLEPORT, OHIO.

The well known and high class street pavers and building brick coming from the Ohio Valley are made on this machine, the above Company have several machines ready for shipment, and are prepared to place a machine with responsible parties on very easy terms, parties interested can send a few barrels of clay to the makers (freight prepaid), they will be pleased to make samples and shfp green and burned brick for inspection, the machine is POSITIVELY guaranteed, and intending purchasers will do well to write the Ohio Machine Company for particulars.

Anglo-American Pottery.

Old English China with American Views.

A MANUAL FOR COLLECTORS, BY

DR. EDWIN ATLEE BARBER, A. M., Ph. D.

Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

The price is $1.60 per copy, postage prepaid.

T. A. RANDALL & CO.,

The Clay-Worker.

INDIANAPOLIS, IND.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

FOR SALE — One 42-inch Steadman mill, used only a few days; good as new; will be sold cheap. C. and A. POTTS & Co.,
4 2 1 Indianapolis, Ind.

FOR SALE — One Buffalo Forge Co. engine dryer fan. Fan 8 feet in diameter, 3½ feet wide; engine 9 x10 cylinder.
C. G. BARKWILL,
3 2 d k Cleveland, Ohio.

FOR SALE — CHEAP—One Rathsom patent flower-pot machine, nearly new; run but one season. For price,etc., address
HOOPER BRICK MFG. CO.,
4 1 c m Hooper, Neb.

FOR SALE — Brickyard fully equipped, central Iowa. Will sell whole or an interest to practical man. Cost $25,000. Less than half will buy it. Good reasons. Address "PAVING BRICK,"
4 3 c m care City Bank, Boone, Ia.

WANTED — Position as manager or superintendent of enamel brick or terra cotta works, thoroughly practical and experienced. Highest references. Address
"CERAMIC CHEMIST."
4 1 c care Clay-Worker.

WANTED — At once for the South, first-class kiln burner. Down draft kilns. Fire clay goods. None but competent, steady men need apply. State wages required and references. Address
4 1 c W. P., care Clay-Worker.

WANTED — Two men; one that understands burning stiff mud brick in both up and down draft kilns, and one to set brick in the same kilns. Single men preferred. Address
NANSEMOND CLAY WORKS,
4 1 c Suffolk, Va.

WANTED — An experienced burner; one who understands how to burn both the Dutch and Morrison kilns with coal. A sober, steady, industrious man will be given permanent employment at good wages. "VIRGINIA,"
4 1 d m Care Clay-Worker.

WANTED — Situation as superintendent of building brick plant. Have had several years' experience with Chambers machine, steam shovel, etc. Can give best of reference. A permanent position more important than salary. Understands the management of men. For other particulars address
4 1 d r MR. PUSH, care Clay-Worker.

WANTED — A practical man with capital wanted to take an interest in a brickyard near Vancouver, B. C., with a view of going in for the press brick and sewer pipe branches. Clay has been thoroughly tested and unlimited in quantity. Good water power and fuel. No competition. Should pay 50 per cent. on the outlay.
4 1 d W. SHANNON, Vancouver, B. C.

FOR SALE — Two brickyards in first-class shape, pallet system. One three-machine yard, capacity five to six millions, sidings from two railroads direct to shed. One two-machine yard, capacity two and a half to three millions, siding from railroad direct to shed. Both yards load direct from kiln to cars. These yards located so they cover the markets of Massachusetts, Rhode Island and Eastern Connecticut, and are equipped ready to operate. MARCY & GARDNER,
4 3 d Palmer, Mass.

FOR SALE.

One Iron Standard steam power machine, with pug mill attached.
One Fletcher & Thomas pug mill.
One Anderson Brick Machine, with 12-foot pug mill.
Two reliable hand brick machines.
One new Brewer Crusher.
One second-hand Brewer Crusher.
One Carnell repress.
One Penfield No. 7 brick and tile machine.
One Penfield soft mud machine.
One Penfield double plunger brick machine.
One Freese board delivery cut-off table.
One Fate-Gunsaulus rotary table.
One forty-horse power boiler and engine.
One Monarch Machine, used two summer seasons: in excellent repair.
THE HORTON MFG. CO.,
4 tf d Painesville, O.

WANTED — STONEWARE TURNER, thoroughly competent and with first-class references.
LOS ANGELES STONEWARE CO.,
3 2 dm 423 N. Ave. 26, Los Angeles, Cal.

WANTED — A first-class man as superintendent of a sewer pipe factory. State experience, salary expected and for whom you have worked. Address
4 3 d J. T. S., care Clay-Worker.

FOR SALE — Forty kiln cars, one Buffalo Forge Co. engine dryer fan. Fan 8 feet in diameter, 3½ feet wide; engine 9x10 cylinder.
C. G. BARKWILL,
3 1 d Cleveland, Ohio.

FOR SALE CHEAP — 5,000 to 6,000 Mershon C Pallets with risers on ends; Two 6-Mould Brick Machine (Soft Mud); One Winding Drum; Two 1½ yard Bottom Dump Clay Cars. Machinery practically new.
Address,
H. MULBERGER, Executor.
3-3 cm. Watertown, Wis.

WANTED — A Situation as superintendent or foreman of terra cotta, tile or pressed brick plant. Understand all the details of making and burning porous terra cotta. Also the construction of kilns of all sorts. Satisfied with moderate salary if the situation is permanent. Best of references. Address
4 1 2 MILFORD, care Clay-Worker.

WANTED — A good brick setter. An experienced man who can set from 25,000 to 30,000 building brick per day. Also a burner who understands both the up and down draft kiln. Steady job and good wages to reliable and industrious workmen. Address
4 1 d SEELY, care Clay-Worker.

FOR SALE — One Simpson dry press brick machine, four molds. One Johnson dry pan. Two represses. Makers, Carnell and Kueny. Two hundred cars and track for Sharer's dryer. All in good order. Apply to THE CHARLEMAGNE & LAC OUAREAU LUMBER CO., Ltd.,
3 3 c m Charlemagne, Quebec.

FOR SALE — Two Penfield auger brick machines with automatic end cuts; 50,000 capacity each. Two Sioux City Corliss engines, 75 to 100 horse power each. One boiler, 80 horse power, with full front. 10,000 wooden, brick pallets. 250 Brick Cars. All of this machinery is as good as new. Will sell cheap.
J. A. BUCKSTAFF,
4 1 d m Lincoln, Neb.

FOR SALE — Brick machinery.
We buy and have for sale all kinds of machinery; good second-hand engines, boilers, brick machines, crushers, pugs, presses, dryers, cars, rail, etc.
We have several yards in operation for sale. We equip entire new yards.
Write us what you want. Address
3 tf d C. W., care Clay-Worker.

FOR SALE — Brick plant at Big Rapid Mich. The profits from business will pay for plant in five years. Capacity of plant two to three million per year. Fifty acres of land. Modern machinery. New brick dwelling house. Good sheds, barn and office. Brick sales good. A fine opportunity for young man with small capital. Terms easy. Apply to
4 1 p W. H. VANDER HEYDEN,
Ionia, Mich.

A COMPLETE BRICK PLANT FOR SALE AT A BARGAIN.

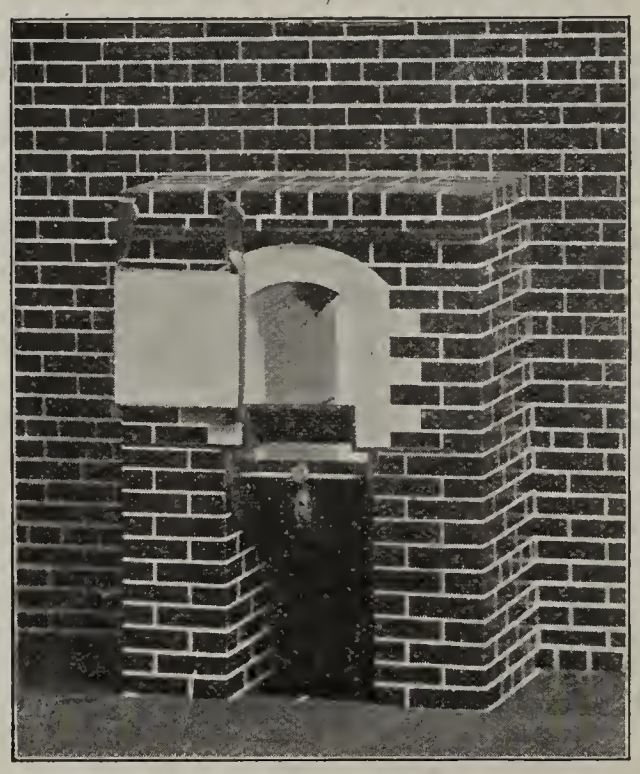
EVERYTHING NEW.

Only brick plant located in Warren, O., a town of ten thousand inhabitants. Having bought same at assignee's sale, must be disposed of at once.
THE HORTON MFG. COMPANY,
Painesville, O.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.
PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.
SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH,
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 4 tf d

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.



For **uniformity** in **burning, hardness of ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump**, and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

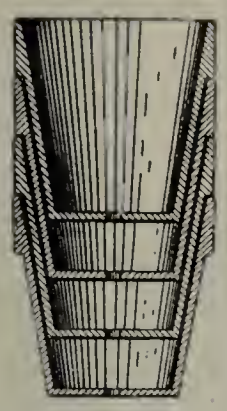
H. W. CALDWELL & SON CO.,

CONVEYING, ELEVATING AND POWER TRANSMITTING MACHINERY.

OUR NEW PLANT.

Western Avenue, 17th-18th Streets, CHICAGO, ILL.

With enlarged plant and the best facilities for economical production of our line of machinery, we announce change of address as above.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

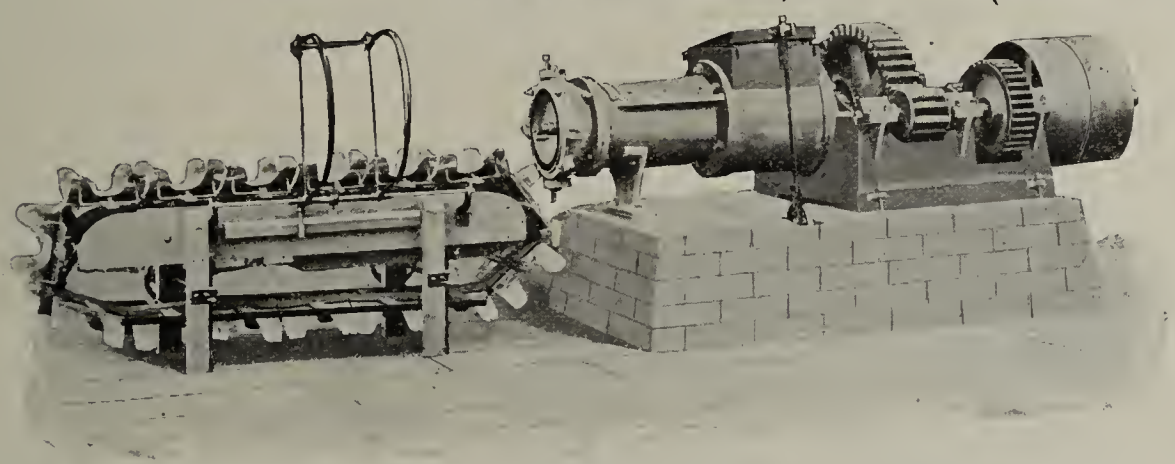
78 South Pennsylvania St., INDIANAPOLIS, IND.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,

Detroit, Mich., U. S. A.

FOR SALE —A good, well-equipped tile factory, in central Ohio. Worth the money. A bargain. Address
2 3 cm J., care Clay-Worker.

WANTED -- Two seven-foot (second-hand) dry pans.
MONMOUTH POTTERY CO.,
2 3 d Monmouth, Ill.

FOR SALE — One 36-inch Stedman Mill, latest make, almost new. Can give good reason for selling. Apply to
ERIE CHEMICAL WORKS, Erie, Pa.
2 3 d

FOR SALE — First-class Sewer Pipe Plant. Unlimited amount first-class clay and a good market for all ware made. Good reason for selling. Address J. W. & T.,
2 3 dm Care Clay-Worker.

FOR SALE — One four-mold Eureka dry pressed brick machine, but little used, at a great bargain; one No. 2 Worrell dryer; one 48-inch Ross disintegrator.
C. SIEDLER,
11 tf d 156 Fifth Ave., New York, N. Y.

WANTED — Clay manufacturing plants to locate in cheap coal belt of southern Illinois and Indiana. Special inducements, with excellent quality of shale, pottery clay, fire clay and surface clay. Address
L. H. SKINNER,
Room 811, Lincoln Trust Building,
3 3 d St. Louis, Mo.

RARE OPPORTUNITY — An interest in well located and well equipped Brick Yard in Northern Michigan is offered on very desirable terms to a reliable manager with capital. Good market, inexhaustible material, cheap fuel and two railroads
GEO. KANE,
4 1 c Care Clay-Worker.

WANTED — For a large clayworking establishment, located near New York city, an experienced superintendent or manager, who thoroughly understands the manufacture of fireproofing as well as common brick; applicants please state past experience, amount of salary expected, references, etc. Address
H. F. JAMES,
11 tf d 156 Fifth Ave, New York.

WANTED — A situation as superintendent or foreman of paving brick department in a clay manufactory. Have had years of experience, and can successfully manufacture blue vitrified paving brick, such as have proven so satisfactory in England. They are generally considered the most durable of all paving brick, and can be made from shale or clay used in this country in the manufacture of sewer pipe. etc. These brick can be made at small cost—little, if any, more than common builders. I will guarantee this and to produce paving brick the equal of any made in this country. I know whereof I speak, and do not propose to indulge in any experimental work. Can give the best of references. Address "BLUE PAVER." care Clay-Worker. 3-1-r

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE.
12 tf d 250 W. 19th St., Erie, Pa.

FOR SALE.

Michigan brick and tile machine, with upright pug mill, pulleys, tile dies 2½ to 12 inch, hollow brick die, hollow block die, side and end-cut brick dies and all cutting tables.

No. 2 Adrian brick and tile machine, tile dies 2½ to 8 inch, side and end-cut brick dies and combination cutting table.

Board delivery cutting table, new.

Little Giant repress, same as new.

Kiln grates.

30 horse power tubular boiler, with front, stack and grates.

Canton duplex boiler feed pump, new.

40 horse power center crank engine.

40 horse power tubular boiler, all fixtures complete.

Penfield double plunge machine, tile dies 3 to 12 inch, brick die and all cutting tables, same as new.

Rotary brick and tile table, nearly new.

65 foot, 8 ply, 14 inch Leviathan belting.
3 tf d J. F. CLARK, Morenci, Mich.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — Boiler and engine in No. 1 condition, as good as new. Cylinder engine 12x12; boiler about 40 horse power. All connections ready to set up in good shape. Also 40-foot smokestack, 20 inches in diameter, one Penfield plunger brick machine, one Freese board delivery cut-off table. For prices, etc., address
2 3 cm S. SHANNON, Shellsburg, Ia.

FOR SALE — Splendid plant for manufacturing brick and porous terra cotta. Situated 15 miles east of Cleveland, O., between Lake Shore and Nickle Plate Railroads, having switches from both roads. Has 25 acres excellent clay bed, boilers, 150 horse-power engine, machines, presses, steam dryers, kilns and full equipment. Reason for selling, owner nonresident and in ill health. For further information call at 701 Cuyahoga Building, Cleveland, or write to
2 4 dm W. B. OWEN, Hobart, Ind.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address
OLD BRICKMAKER,
1 tf d Care Clay-Worker.

ODD LENGTHS OF RUBBER AND GIANT RED STITCHED, from 2 ft. to 80 ft. long, and from 1 in. to 16 in. wide; 3, 4, 5, 6 and 8 ply. **First-Class Belting** less than infrs. cost prices. **Get Our Prices** on Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gages, Brass Fittings, Hard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws, Asphalt Felt Roofing, Endless Thresher Belts. **One Trial** will make you a regular customer of the **MILLER OIL AND SUPPLY COMPANY**, 36 McNabb St., Indianapolis, Ind.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. Carbonate of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

Have you thought About your Cuts for your NEXT CATALOGUE? We Make 'em Right
INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.
INDIANAPOLIS, IND.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } Chenoa, Ill.

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

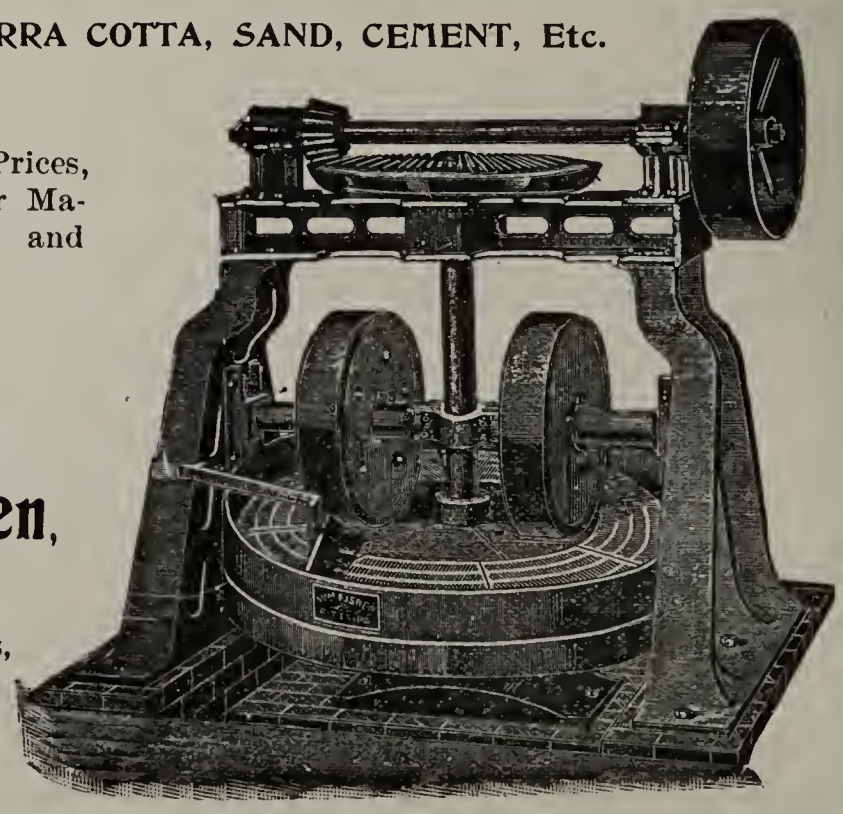
W. B. MERSHON & CO.,

Saginaw. East Side Mich.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.



Phillips and McLaren,

Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Dean Bros.' Steam Pump Works

INDIANAPOLIS, IND.

DUPLEX PUMP. SINGLE.

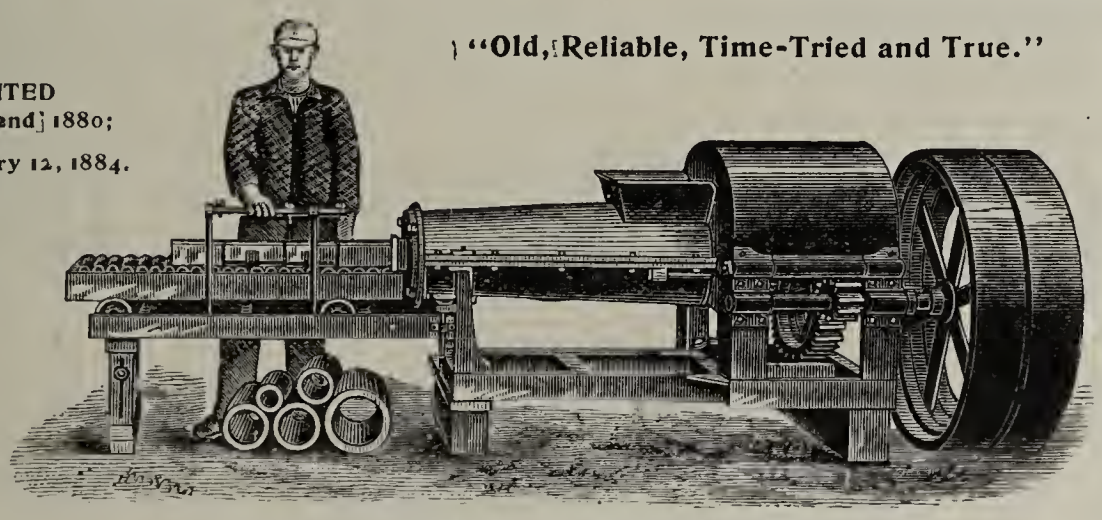
PUMPING MACHINERY FOR ALL PURPOSES.

SEND FOR CATALOGUE AND PRICES.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED June 22nd, 1880; and February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

VanDuzen's STEAM JET Pumps.

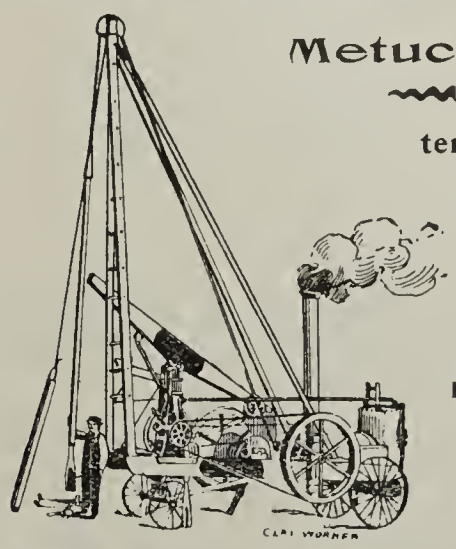
Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** etc., for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

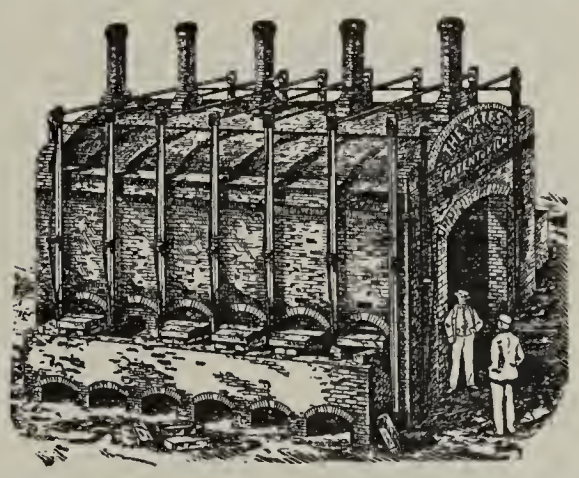
W. R. Osborne,

Metuchen, N. J.

ter Wells, Tanks, Pumps, Etc.



LOW PRICES



Economy of Fuel and Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns. Hot air dryer. Continuous and Muffle Kiln.

ALFRED YATES,
JOHNSONBURG, PENN

---

50 YEARS' EXPERIENCE

PATENTS

TRADE MARKS
DESIGNS
COPYRIGHTS &C.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. Handbook on Patents sent free. Oldest agency for securing patents.

Patents taken through Munn & Co. receive *special notice*, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms, $3 a year, four months, $1. Sold by all newsdealers.

MUNN & Co. 361 Broadway, New York

Branch Office, 625 F St., Washington, D. C.

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY,
Industrial Agt., St. Louis, Mo.

or

E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between CINCINNATI, INDIANAPOLIS, DECATUR and SPRINGFIELD, ILL.

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	3.35 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

Solid Train Between

Sandusky and Peoria

—AND—

INDIANAPOLIS and MICHIGAN CITY,

FT. WAYNE and CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger	7:00 a. m.
*No. 22 Passenger	1:20 p. m.
No. 24 Passenger	7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger	10:20 a. m.
No. 23 Passenger	2:50 p. m.
No. 25 Passenger	6:20 p. m.

*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent, Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

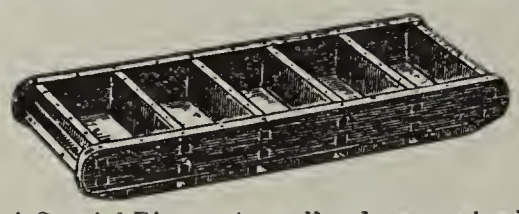
For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**



We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.

Increases grinding capacity.

Gives a finer grade of clay

Does the work as well in cold weather as in warm.

Screens cold moist clay as well as dry.

It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush

HAS NO EQUAL.

Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

The Peerless System Up-Draft, Down-Draft and Continuous Kilns

Is the Acme of Perfection in Brick Burning.

READ WHAT THEY SAY ABOUT IT:

LaPrairie Pressed Brick and Terra Cotta Co., Quebec:

"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, demonstrates our Entire Satisfaction with your PEERLESS SYSTEM.

Elmsdale Brick Co., N. S.:

"Never saw a Kiln work so even and free both in watersmoking and burning in all my life. The arches were as good as any other part of the Kiln."

John Cubbins Sons, Memphis, Tenn.:

"After burning the first kiln that was changed, the second time, we found the improvement so great and so much Superior to the old updraft kilns, that we are now changing our entire system to your PEERLESS PATENT."

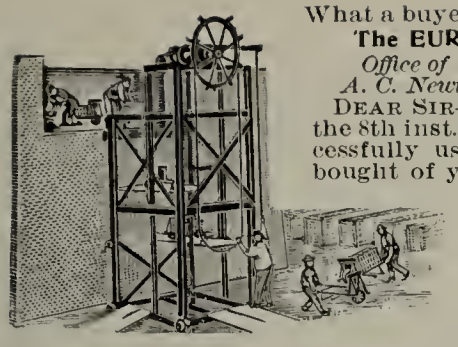
Jacob Kline, Baltimore, Md.:

"Your system of burning good hard brick is without doubt the best I have ever seen."

And there are Others.

No matter what you manufacture, or the capacity of your plant, if your make is of clay and you want it burned, write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. Montezuma, Ind.



What a buyer in 1890 says to-day of
The EUREKA BRICK ELEVATOR

Office of the Buffalo Brick Association,
A. C. Newton, Patentee, Cresent, N. Y.

DEAR SIR—Replying to your inquiry of the 8th inst., this Association is still successfully using the two brick elevators bought of you in 1890. They are useful and practical machines, and the long and hard use of them by us shows that they are constructed in a very serviceable manner.

Very truly yours,
The Butfalo Brick Asso.
O. W. WAGER, Mgr

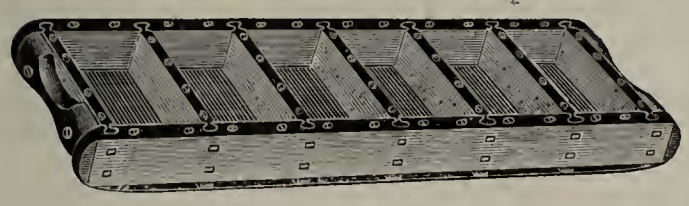
Write for particulars.

A. C. NEWTON, Manufacturer, Crescent, N. Y.

HARDIN & GRAY,

MANUFACTURERS OF

BRICK MOULDS



Of every kind and description. We make a specialty of Brick Moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

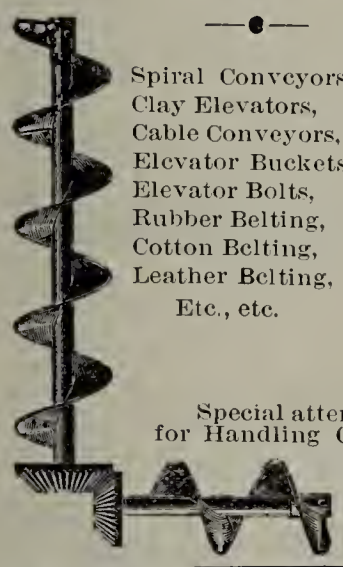
Special sizes made to order quickly.

Don't fail to get our prices. (Telephone 1084.) **1510 W. Washington St., Indianapolis.**

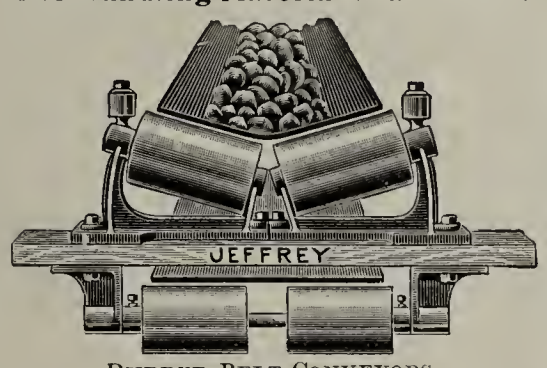
The JEFFREY MANUFACTURING CO., Columbus, Ohio.

Elevating, Conveying and Power-Transmission Machinery,

For Handling Material of all Kinds.



Spiral Conveyors,
Clay Elevators,
Cable Conveyors,
Elevator Buckets,
Elevator Bolts,
Rubber Belting,
Cotton Belting,
Leather Belting,
Etc., etc.



RUBBER BELT CONVEYORS.

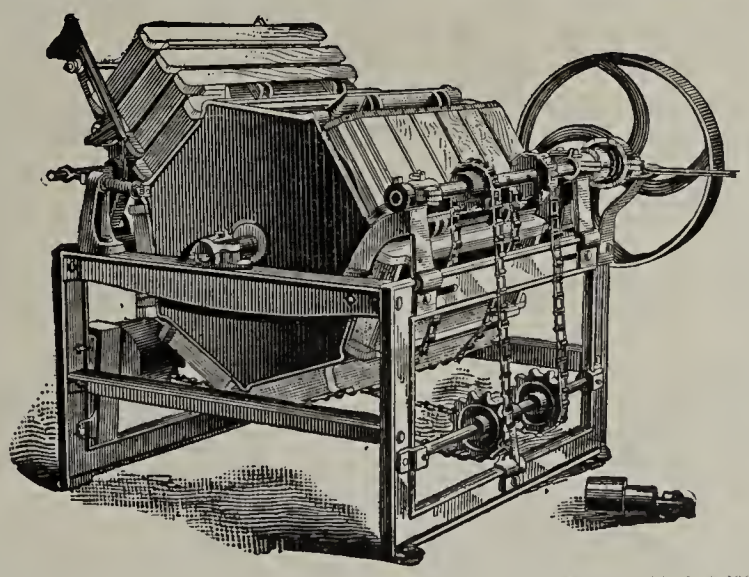
Jeffrey Detachable Chain,
Chains, (all styles).
Sprocket Wheels,
Shafting,
Pulleys,
Hangers,
Gearing,
Elevator Boots,
Etc., etc.

Special attention given to the designing of machinery for Handling Clay, Green Tile, Brick, Sewer Pipe and packages of every description. We can in many instances effect a saving of from 10 to 50% over present methods used.

SEND FOR CATALOGUE AND PRICES.

CHAMPION Brick Mould

SANDING MACHINES.



No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.

We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN,
Ass't Gen'l Pass. Agent.
CINCINNATI, OHIO

H. W. FULLER,
Gen'l Pass, Agent,
WASHINGTON, D. C.

The VANDALIA LINE

The Short Line for St Louis and the West.

Leave Indianapolis.	Arrive at Terre Haute.	Arrive St. Louis
No. 15 7:25 am,	9:55 am	5:00 pm
No. 5 7:15 am	9:10 am	1:45 pm
No. 21 12:35 pm	2:37 pm	7:12 pm
No. 11 7:05 pm	9:05 pm	1:44 am
No. 7 11:20 pm	1:25 am*	7:00 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No. 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.

All trains carry first-class coaches.

12:40 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent,
E. A. FORD, G. P. A. Indianapolis, Ind.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 2:30 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 11:55 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY.

Lv Indianapolis, 3:40 am, 8:05 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades.
Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING.

SYRACUSE, N. Y.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

THE COALDALE BRICK AND TILE CO.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

COALDALE VITRIFIED PAVERS,
Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

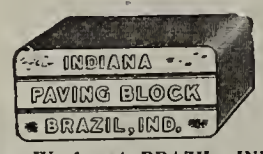
Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT, COALDALE, ALA.
TELEGRAPH OFFICE, WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

INDIANA PAVING BRICK AND BLOCK CO.

W. W. WINSLOW, Proprietor.



Street Paving Brick and Block.

TELEPHONE 1190.
OFFICE: 1 HUBBARD BLOCK,
INDIANAPOLIS, IND.

Works at BRAZIL, INDIANA.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date.
By H. A. Wheeler, E. M.
Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

R. D. CULVER, Pres. and Gen'l Man. I. G. POSTON, Sec'y and Treas.

The Wabash Clay Co.,

MANUFACTURERS OF ALL SHALE

PAVING BRICKS AND BLOCKS.

Our leading brands are POSTON BLOCK, WABASH STANDARDS, "SPECIALS," for crossings on macadam streets, GUTTER BLOCKS and COLUMBIAN SIDEWALK BRICK.

Our material has for years successfully stood the heaviest traffic of Indianapolis, Terre Haute, East St. Louis and dozens of other large cities of Indiana and Illinois. We ask investigation and comparison by those seeking the best paving material. Samples furnished on application.

Office and Works at VEEDERSBURG, IND.

Preston Brick Co.,

MANUFACTURERS OF

Vitrified Shale Paving Brick,

SEWER AND HARD BUILDING BRICK.

Hornellsville, N. Y.

T. B. McAVOY, PRESIDENT. FRANK B. McAVOY, SEC. AND TREAS.

McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA. WORKS:—PERKIOMEN JUNCTION, PENN.

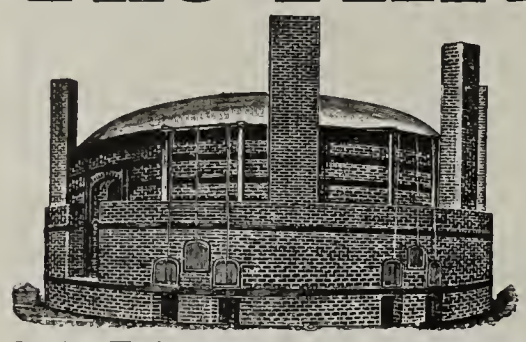
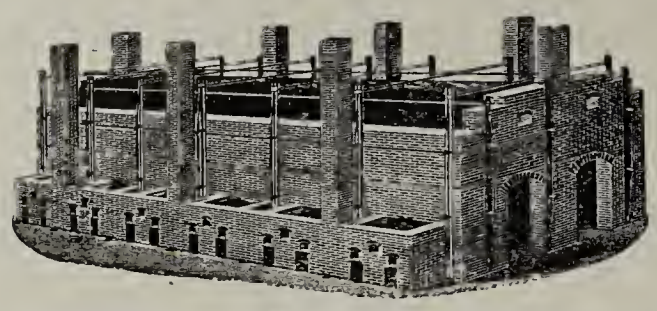
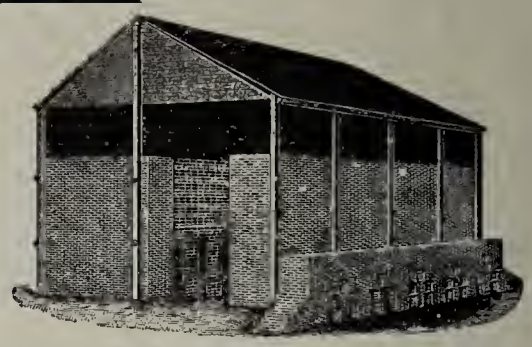
MORRISON'S LATEST IMPROVED KILN

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object. Write us for descriptive pamphlet, prices, etc., address

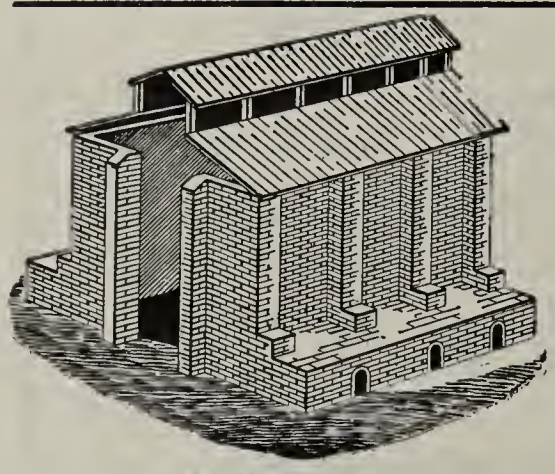
R. B. MORRISON & CO., P. O. Box 335, Rome, Ga., U. S. A.

The THREE KINGS.

SWIFT SLACK COKING TABLE FURNACE KILNS. Over 700 old kilns changed and many new ones built in the past year. Send for Catalogue and Price List of Plans and Specifications.

F. E. SWIFT, Washington, Iowa. U. S. A.

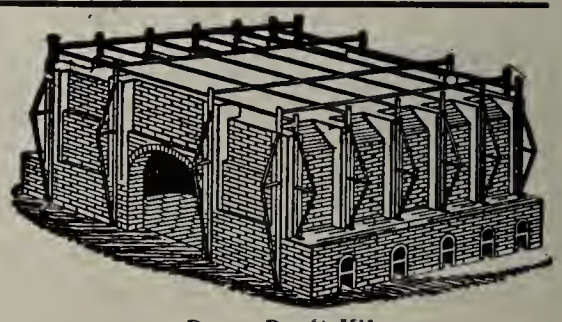


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL,* 2,422 Chestnut St., *Kansas City, Mo.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile, Paving Brick and Common Building Brick.

Horseheads Brick Co., N. Y., August 13, 1899.

Mr. H. Haigh, Catskill, N. Y.

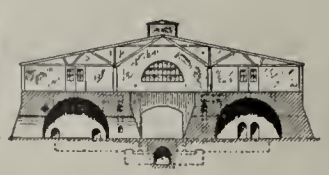
Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success.

In fact we have been able to do much more than you had guaranteed the kiln would do.

We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

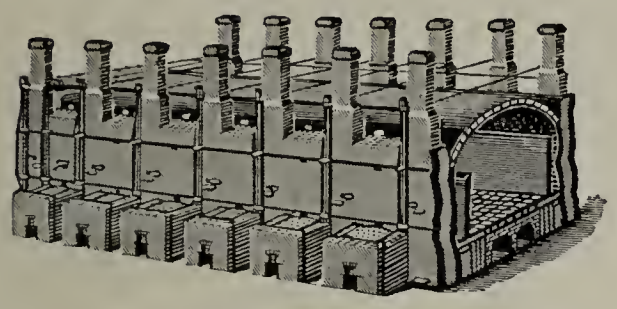
Respectfully yours,
R. G. EISENHART, Treas. and Gen. Man.



This kiln has now been in operation nearly three years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at $2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.

Address **H. HAIGH, Catskill, N. Y.**

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Oaks, Pa , January 26, 1900.
M. M. BUSHONG, Phoenixville, Pa.

Dear Sir:—Your letter of inquiry of the 25th inst, in regard to kiln received; in reply will say it gives us great pleasure to say that your kiln is doing splendid work, we have made eleven (11) burns and they were all a great success, in fact it surpassed our expectations in every particular, both to quality of paving brick produced and the amount of coal consumed and we contribute its success to the perfect system of drafts and absolute control of same. In other words if your kiln does not burn evenly from top to bottom or wall to wall it is the fault of the man in charge and not the kiln.

We have had a wide experience in the kiln line and do not hesitate to say that your kiln is the best for burning Shale Paving Brick to be found.

We can assure you that in the future should we build more kilns they will be the **Bushong Down Draft.** Wishing you success we remain,

Yours respectfully,
PERKIOMEN BRICK CO.,
Per HAGGINBOTHAM, Supt.

BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.

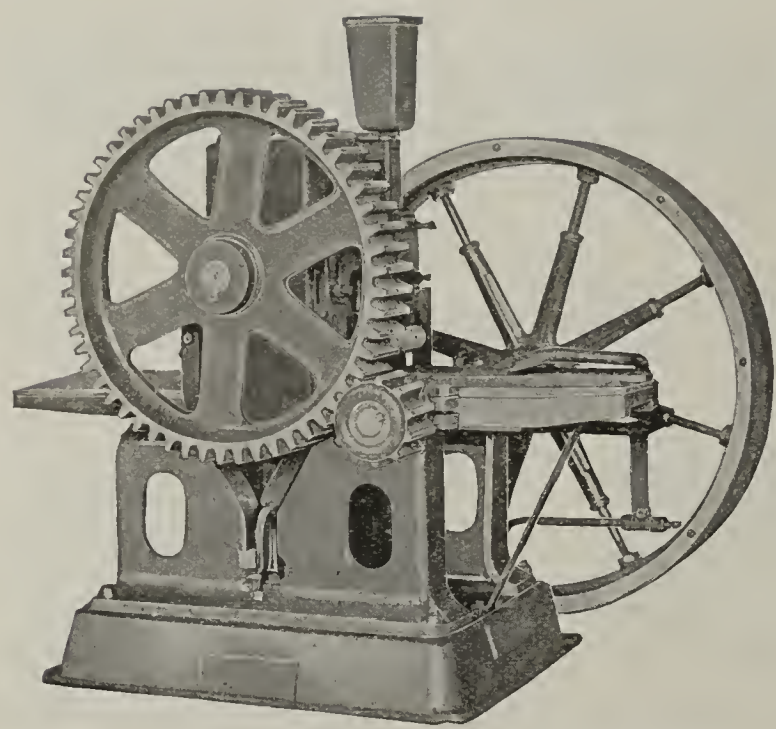
These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



The Steele Repress,

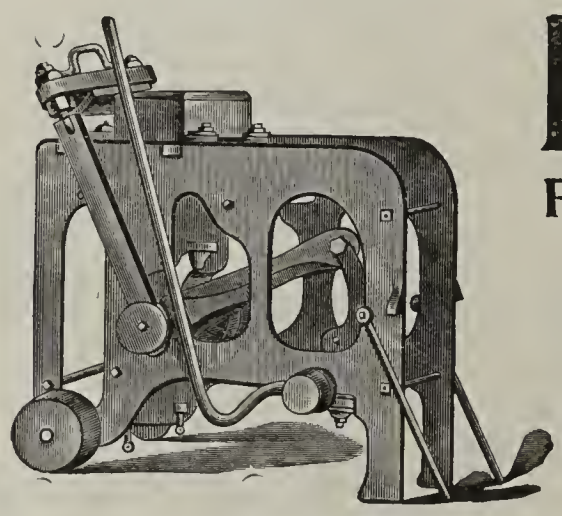
Price $185.00.

This is a very compact, strong and easily operated Press designed for the large number of yards which have more or less local demand for repressed brick which they are now filling with Hand Presses.

The compactness of this machine makes it almost impossible to break it, at the same time reducing the cost to very little more than hand press. A number of them have been in operation the past season giving perfect satisfaction.

Williamsport, Md , Dec 23, 1899.
Messrs J. C. STEELE & SONS, Statesville, N. C.
Dear Sirs: We want you to ship us another of your Power Repress Machines, same size die as the one we got from you last spring, which works very well and satisfactorily. Your Repress Machines are a decided success, as the work of ours proves. Yours very truly,
VICTOR CUSHWA & SONS.

J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**



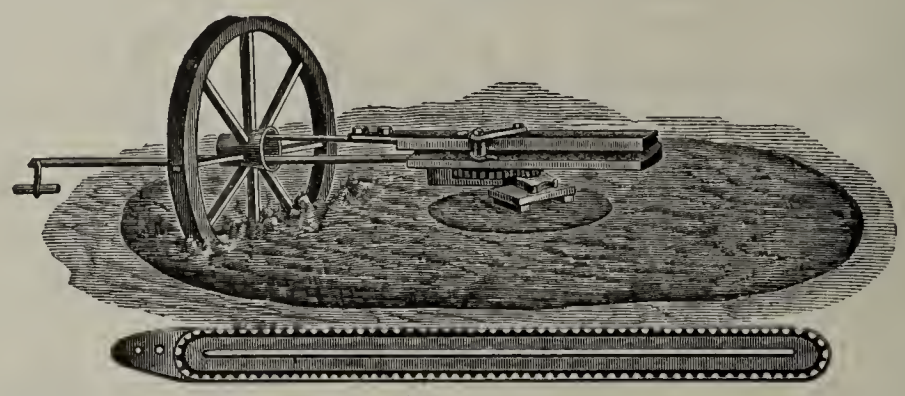
RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

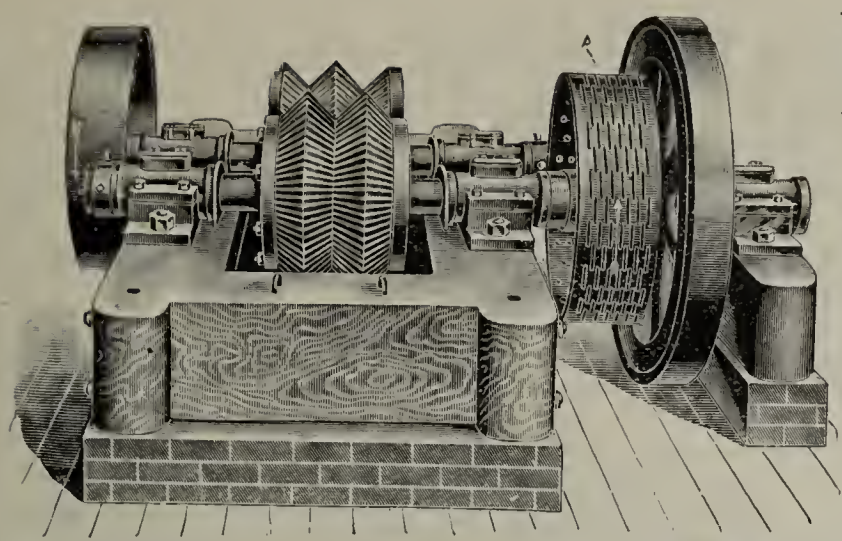
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



NEWELL CRUSHER.

Successfully crushes any and all kinds of Clays, preparing same for Brick, Tile or Terra Cotta. Fully guaranteed. Fast shaft fitted with Para Pneumatic Pulleys, increasing power of the belt, and efficiency of the crusher.

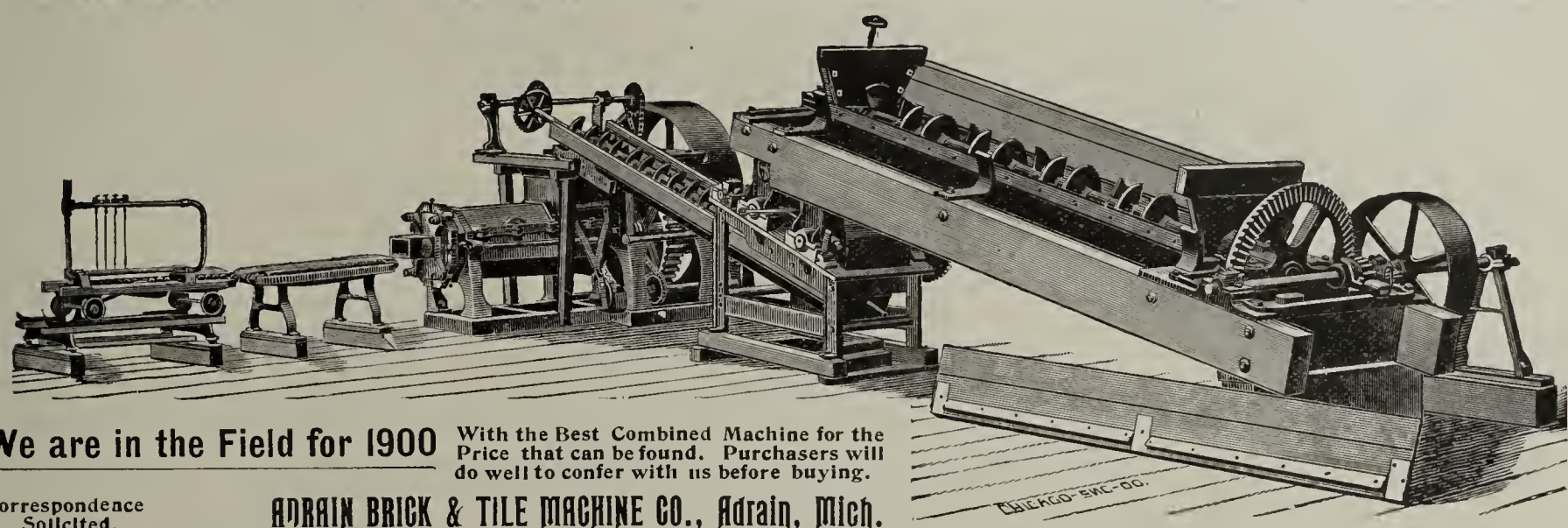
Also we equip these machines with Improved Elastic Roller Bearings when desired. These bearings greatly reduce friction thereby saving power in operating, and insuring an always cool journal.

Our Crushers will do the work where others fail. Prices reduced Quality maintained.

Extract from a recent letter from the Frontier Brick Works, Niagara Falls, N. Y., "THE CRUSHER RUNS FINELY, AND IS ENTIRELY SATISFACTORY."

Write us for price and particulars, stating capacity wanted.

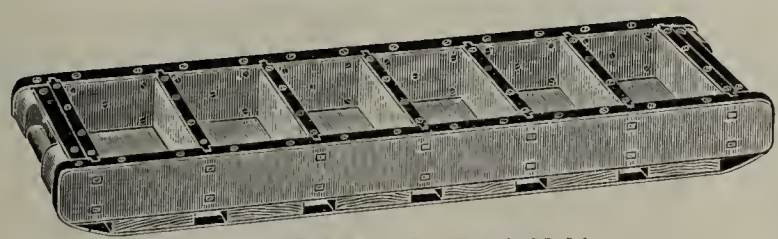
DUPLEX HEATING & MACHINE CO. L'td. Successsors to Newell Universal Mill Co. 534 West 22d. St., NEW YORK.



We are in the Field for 1900 With the Best Combined Machine for the Price that can be found. Purchasers will do well to confer with us before buying.

Correspondence Solicited.

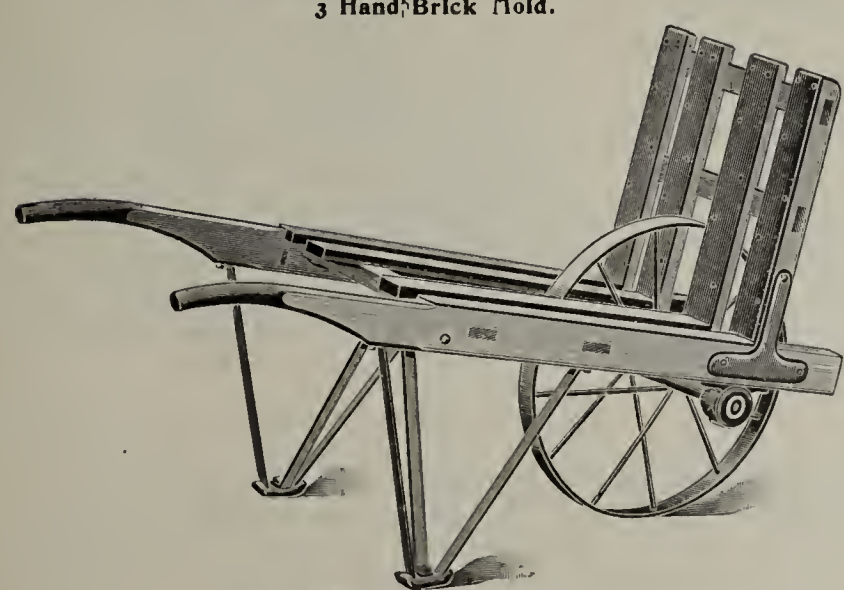
ADRAIN BRICK & TILE MACHINE CO., Adrain, Mich.



Machine, Five and Six Brick Mold.

6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

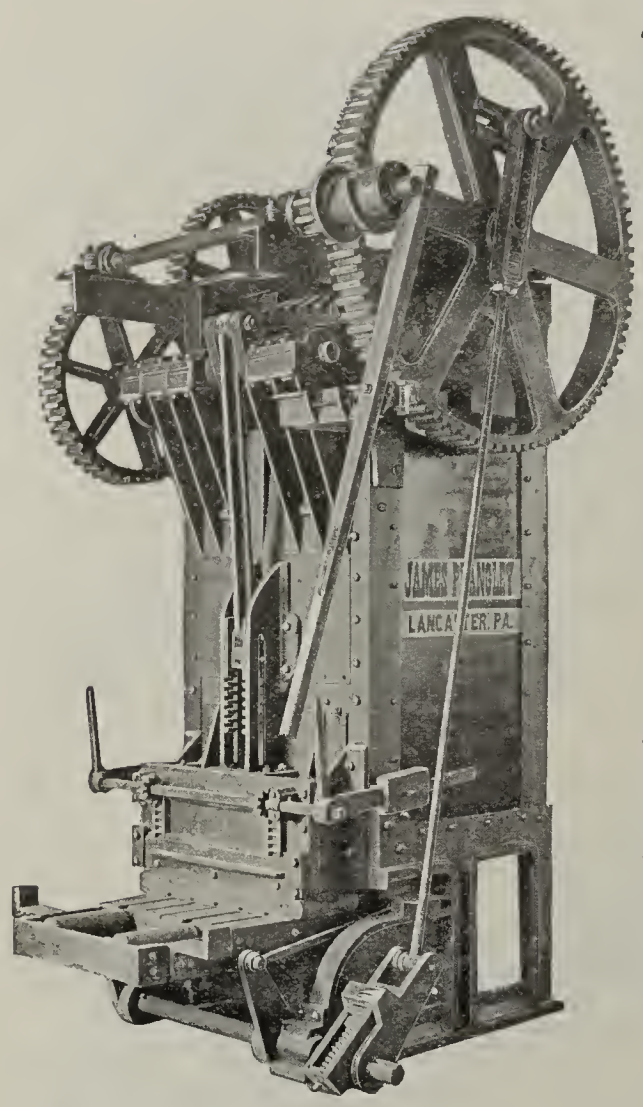
BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

D. J. C. ARNOLD,

New London, O.



The Prangley Brick Machine.

BUILT TO LAST A LIFE TIME.

Large Capacity. Molds Brick Very Stiff. Pug-Mill Not a Necessity, Will Work Clay Direct From Bank.

This Machine is constructed on practical lines by Mr. James Prangley, a successful brickmaker of thirty years experience. The tempering knives are of solid steel, and the press box is lined with steel, making it the most durable machine on the market. Brickmakers who buy the Prangley Machine will get their money's worth.

We now have ready the **PRANGLEY SANDER.** Positively no wear on molds. No waste sand. No time lost in getting molds to machine. It never misses a turn, and it has no apron to wear out.

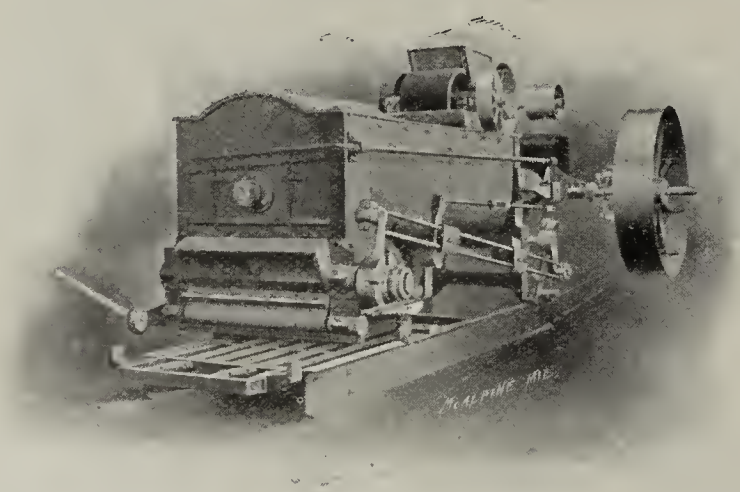
Manufactured by

JAMES PRANGLEY,

Office 666 West Chestnut St.,

LANCASTER, PA.

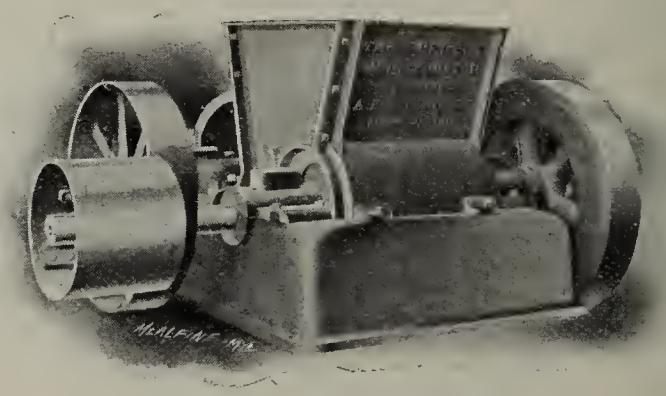
Write for Prices, etc., to
EDWARD C. HUHN,
Sole Selling Agent, 1215 Filbert St., Philadelphia.



Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



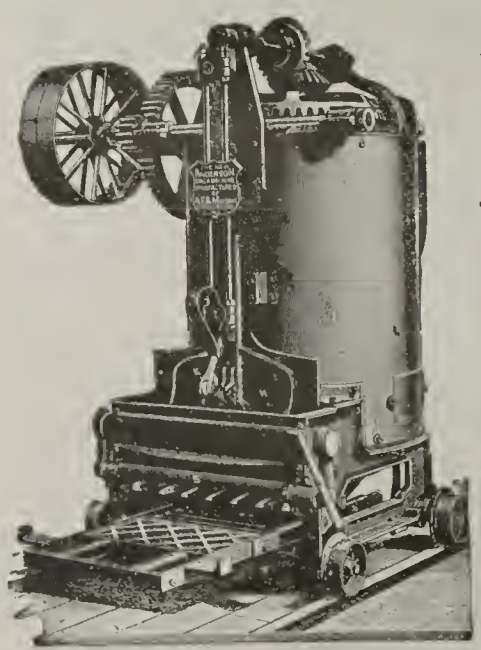
Best Disintegrator on the Market.

MANUFACTURERS OF . . . .

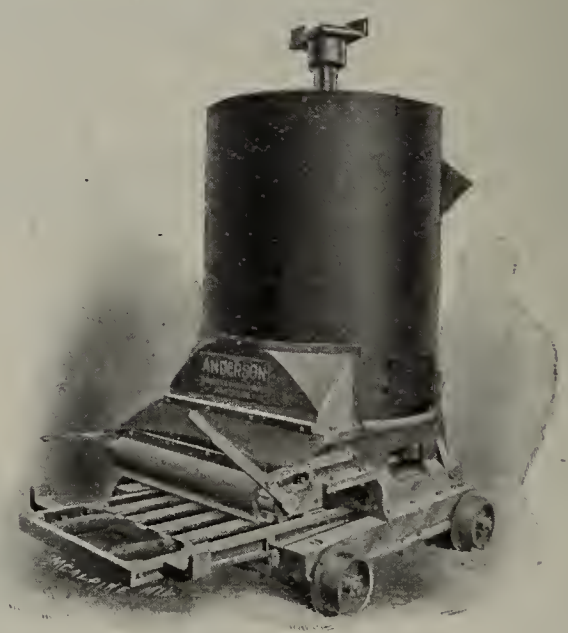
New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.



Steel and Iron Upright Stock Brick Machine.



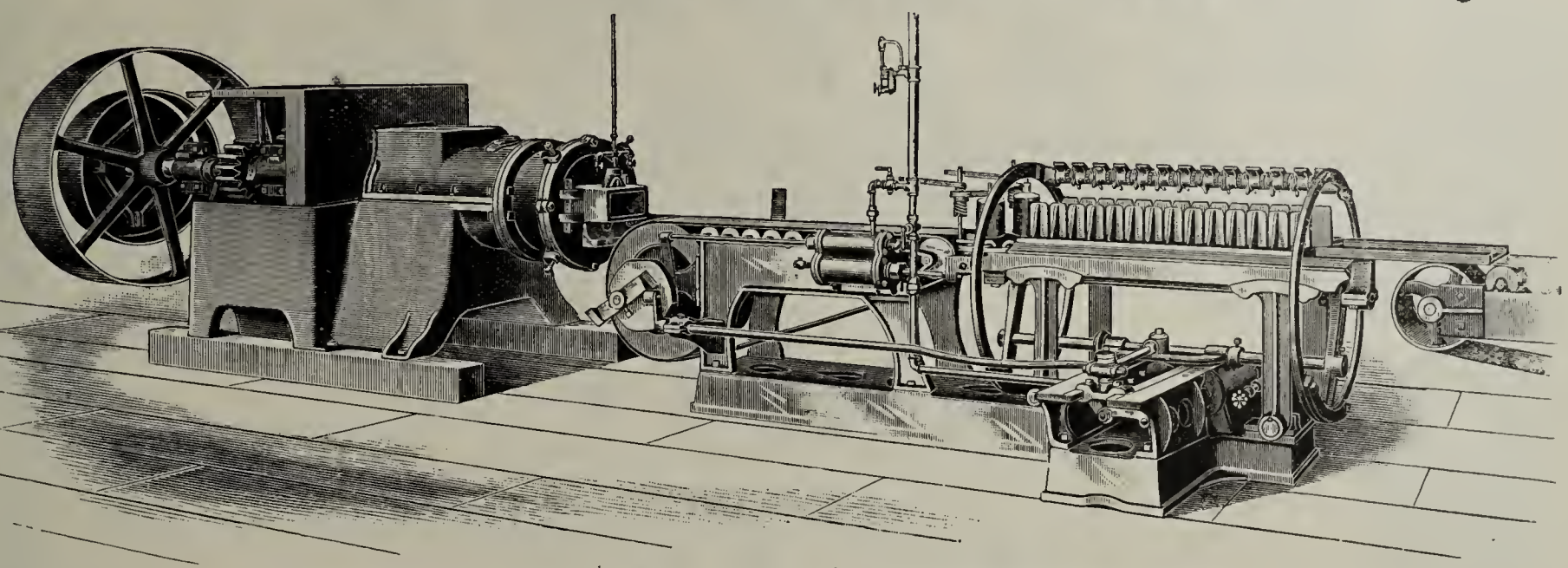
1899 Horse Power Machine.

The Anderson Foundry and Machine Works,
Anderson, Ind.

You Obtain More for Your Money

(When Purchasing)
(While Using)

Leader Machinery

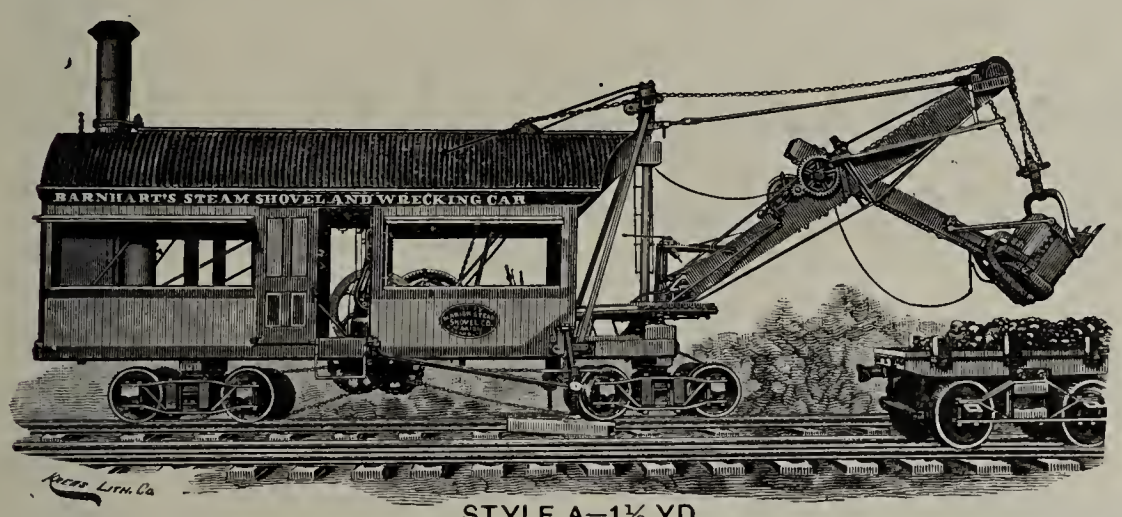


Leader No. 25 with Side Cut Die and Automatic Cutter.

LEADER MACHINES are most economical because they are properly designed and well built. They do good work with least waste. Printed matter illustrating and describing **Leader Brick Machines, Pug Mills, Crushers, Presses,** etc., free.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

BEHOLD!

Is it not Written?

If Ye Have Aught to Do

DO IT.

You Know

Hot Air Is necessary for the drying of brick

Why Not Heat the **Air** instead of heating water to make Steam, and then attempting to radiate the heat from several miles of steam pipe?

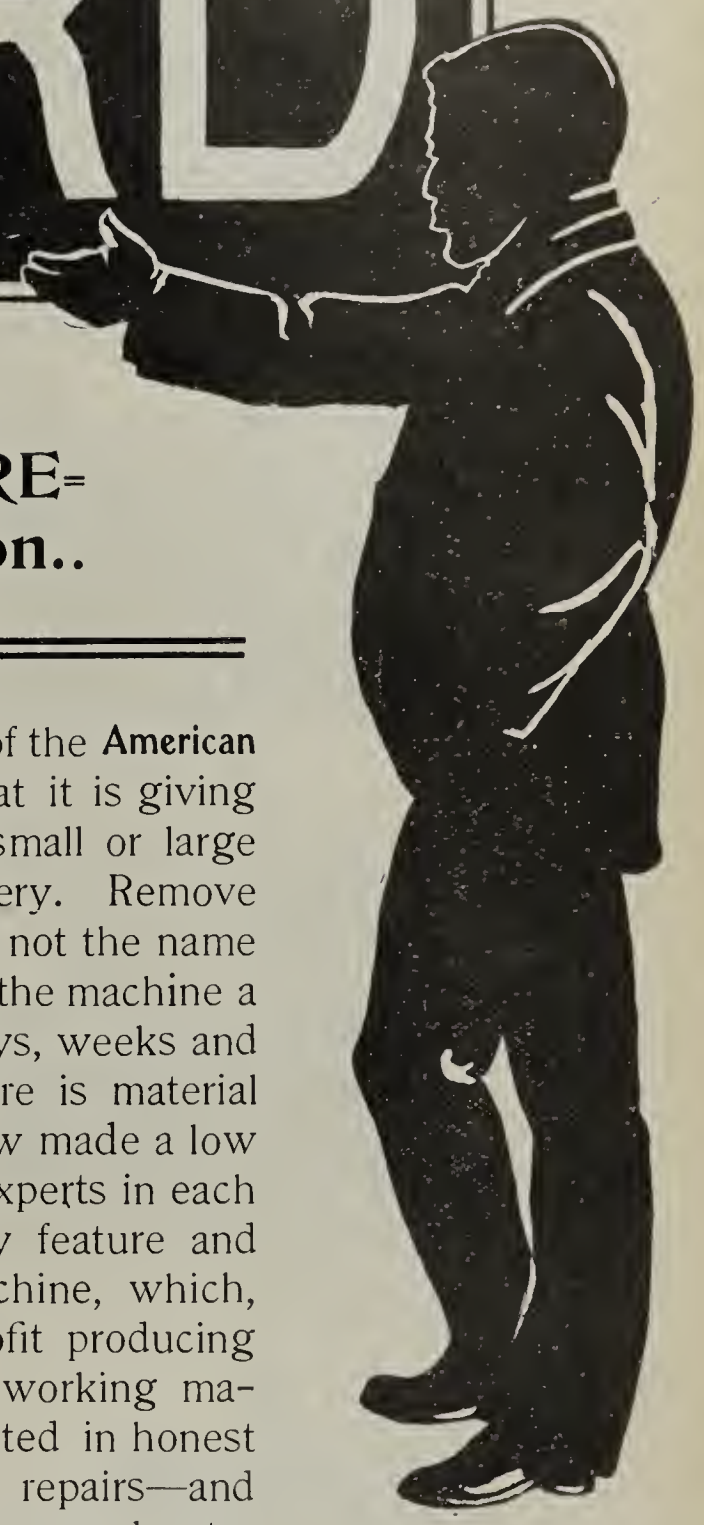
Others are saving **$15.00 per day** by the use of our **Buckeye Dryer,**

Why Not You.

Write Us and we will do the **Rest.**

The CLEVELAND CAR CO.,
CLEVELAND, OHIO.

RECORD



IT'S NOT the Name That Makes the Fame, But the Continuous "RE-CORD" of Successful Operation..

WHEREVER you find a machine bearing the imprint of the **American Clay-Working Machinery Company** you will find that it is giving perfect satisfaction no matter whether it be of small or large capacity of stiff mud, dry press or soft mud machinery. Remove the name plate and the machine still gives satisfaction. It's not the name but the quality which that name carries with it, that makes the machine a success. There are principles of construction on which days, weeks and months have been spent to insure their correctness. There is material bought strictly for its quality and not because a hidden flaw made a low price possible. There is care of workmanship which only experts in each department can insure. There is a watchfulness in every feature and every detail of construction which insures a faultless machine, which, operated with judgment, makes a pleased owner and a profit producing plant. We build over a hundred sizes and styles of clay working machinery. Every one a leader in its line. If you are interested in honest machinery, faultlessly constructed, the kind which save repairs—and money—year in and year out, write us for particulars. Our general catalogue for the asking.

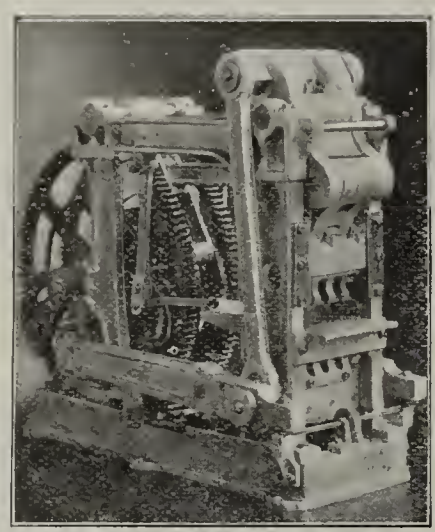
The American Clay-Working Machinery Company,

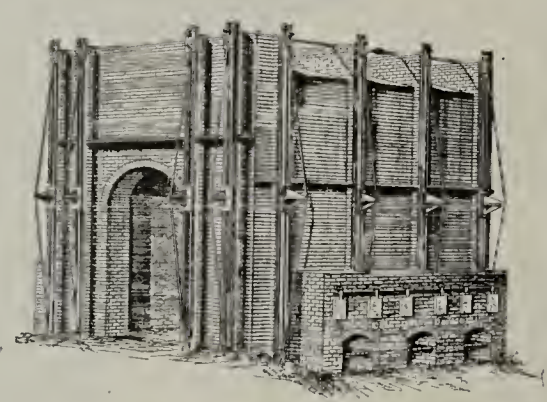
BUCYRUS, OHIO, U. S. A.

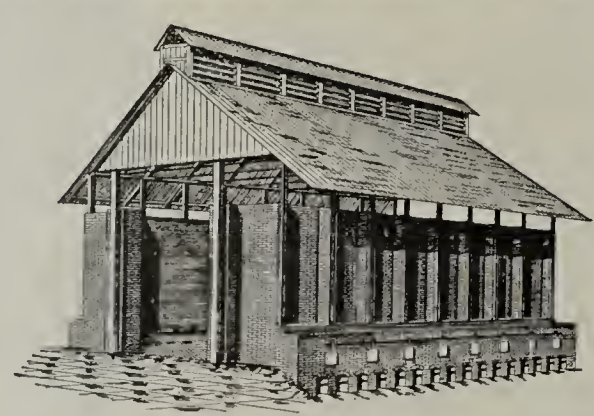
NEW YORK OFFICE: 39 and 41 Cortland St.

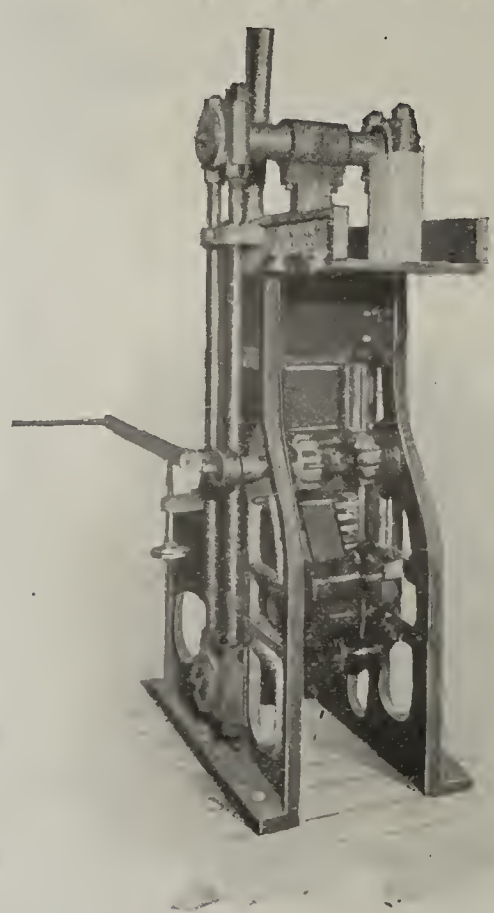
BUILT RIGHT RUN RIGHT

THE MACHINERY THAT NEVER DISAPPOINTS









The GRATH DRY CLAY BRICK PRESS.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

Features:

1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Requires less power to Operate.
5th. Brick free from Granulation.
6th. All Bearings Bushed.
7th. All parts Accessible.
8th. Thickness of Brick Changed without Stopping.
9th Master Wheels Close to Bearings.
10th. No Working parts under Lower Cross Head.

The GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning fine Face Brick, Fire Brick, Sewer Pipe, Tile, Pottery, etc. PERFECT RESULTS with nothing but Slack Coal or Screenings.

The Grath Up-Draft Kiln.

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with slack coal, with better results than lump coal in ordinary Furnaces and without any black Smoke.

The Grath Gas and Coking Furnaces

Can be attached to ALL kinds of Kilns, either old or new, and produce better results with SLACK than lump coal in ordinary furnaces. PROTECTION GUARANTEED TO ALL USERS. WILL PROSECUTE ALL INFRINGEMENTS.

The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK. The only successful Press of its kind in the market.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

The Grath Brick Grinding Machine

FOR GRINDING ARCH AND RADIUS BRICK of any hardness, even to a Vitrified Brick. Simplest and Best in the market. No sand, no discoloration, which means satisfaction.

THE CHEAPEST GRINDING MACHINE IN THE MARKET.
In use by American Hydraulic Press Brick Co.

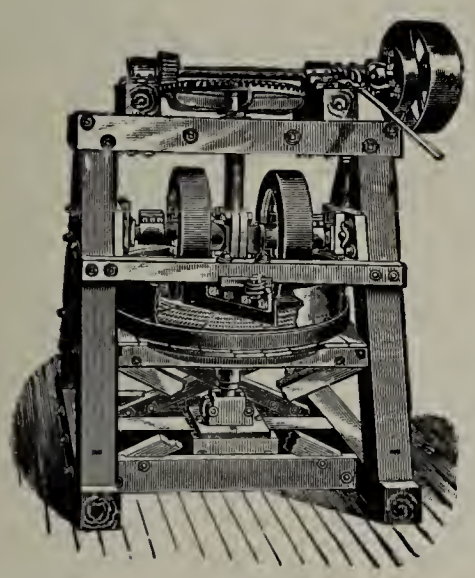
For Further Information and Catalogue on Above, address

The Illinois Supply & Construction Co., ST. LOUIS, MO., U. S. A.

Mention The CLAY-WORKER.

OUR SPECIALTY IS

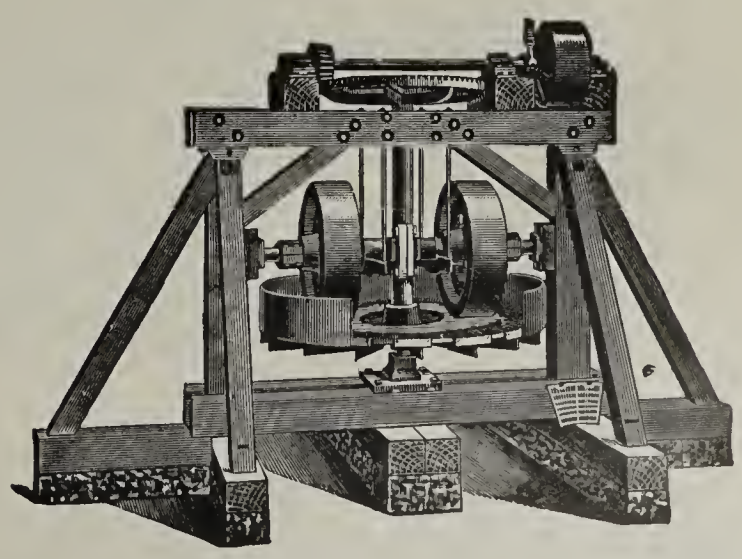
DRY PANS.



IRON FRAMES,

WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

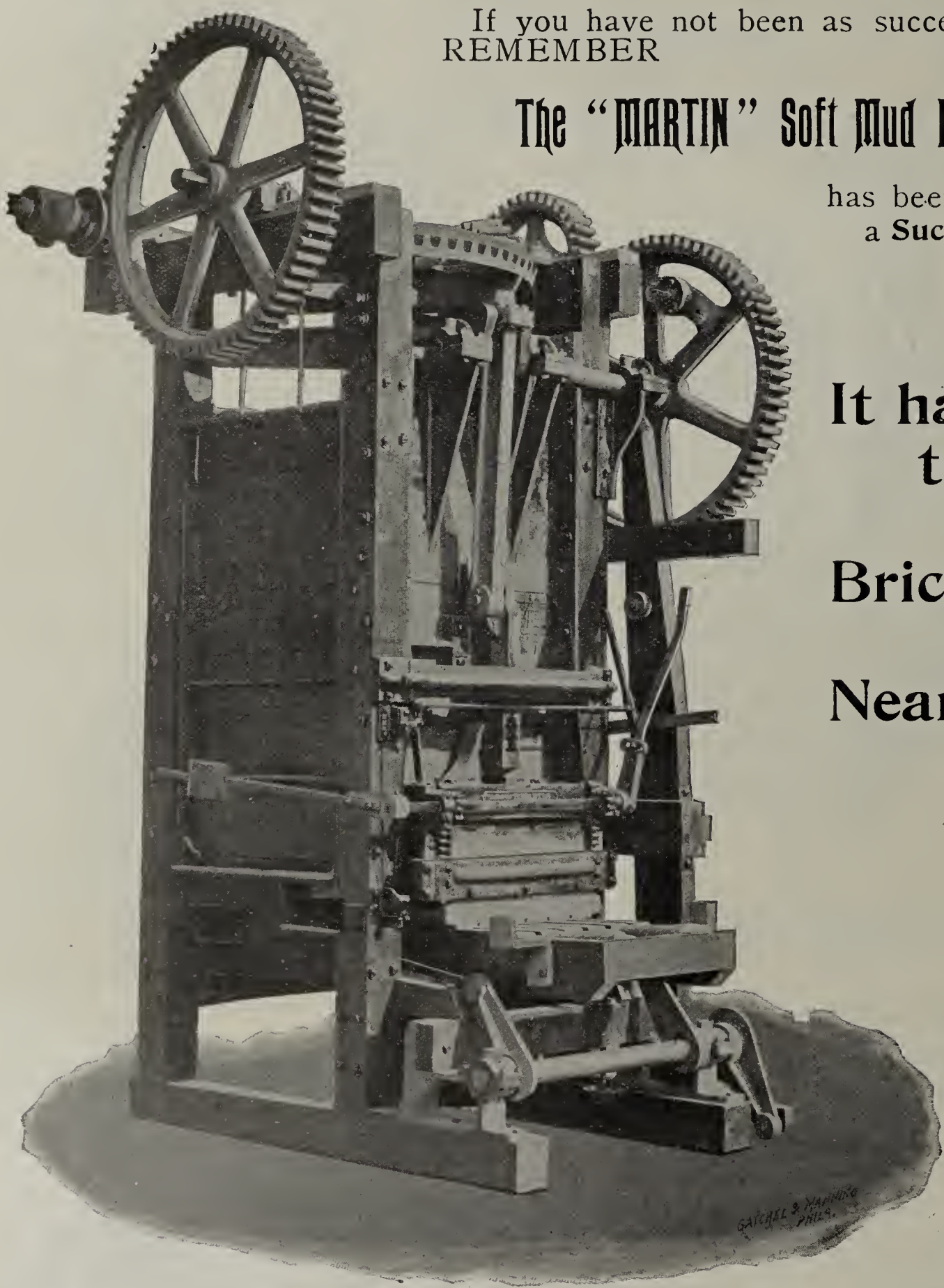
FROST ENGINE CO., Galesburg, Ill., U. S. A.

Start the New Year Right.

If you have not been as successful as many others REMEMBER

The "MARTIN" Soft Mud Brick Machinery

has been the making of many a **Successful Brickmaker.**



It has stood the test of Brickyard life for Nearly half a Century.

Up-to-Date Equipments are OUR Specialty.

We Furnish Everything a Brickmaker Needs.

Our new Catalogue contains much useful information.

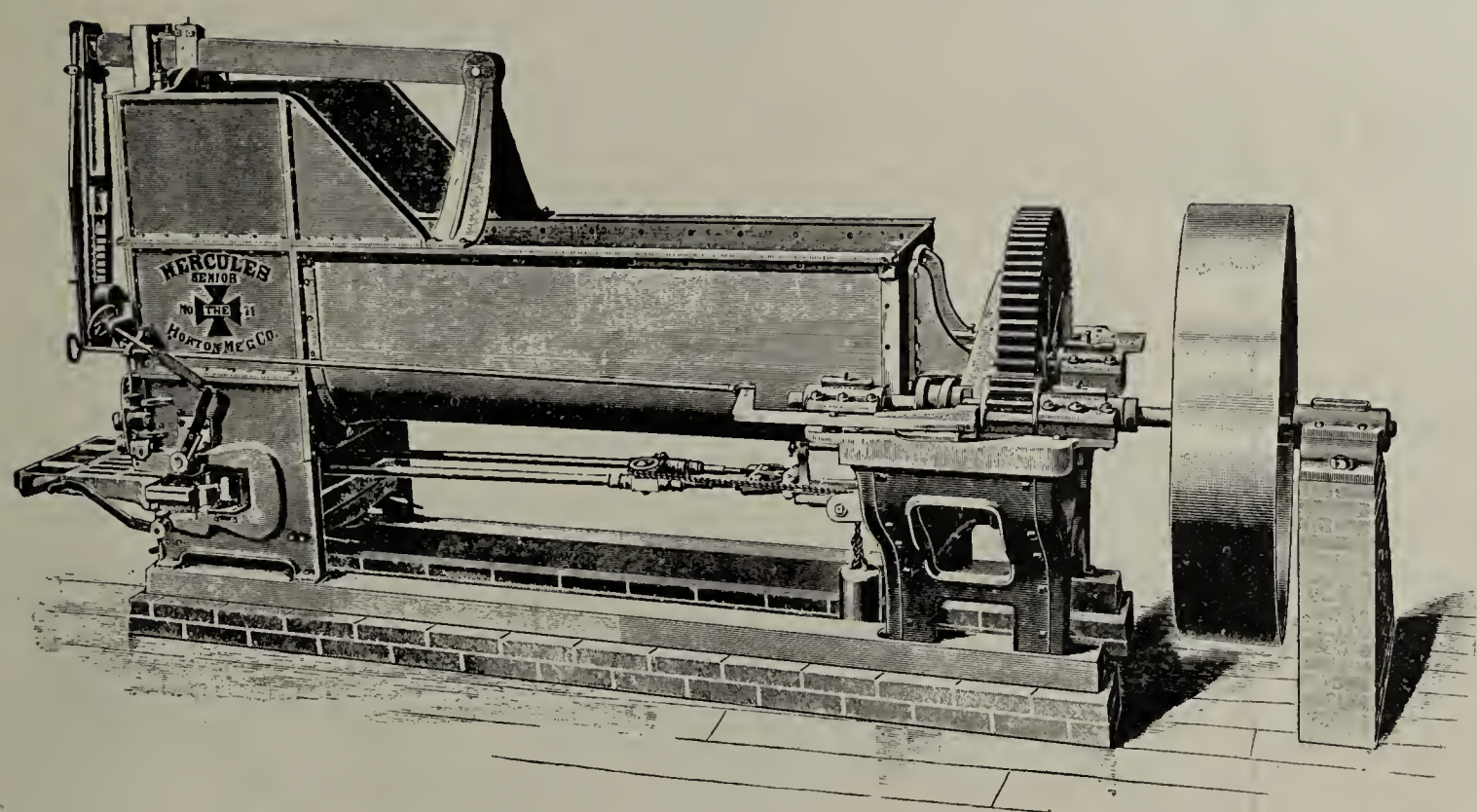
THE HENRY MARTIN BRICK MACHINE MFG. CO., INCORPORATED.

Sole Manufacturers of the "Martin" Patents,

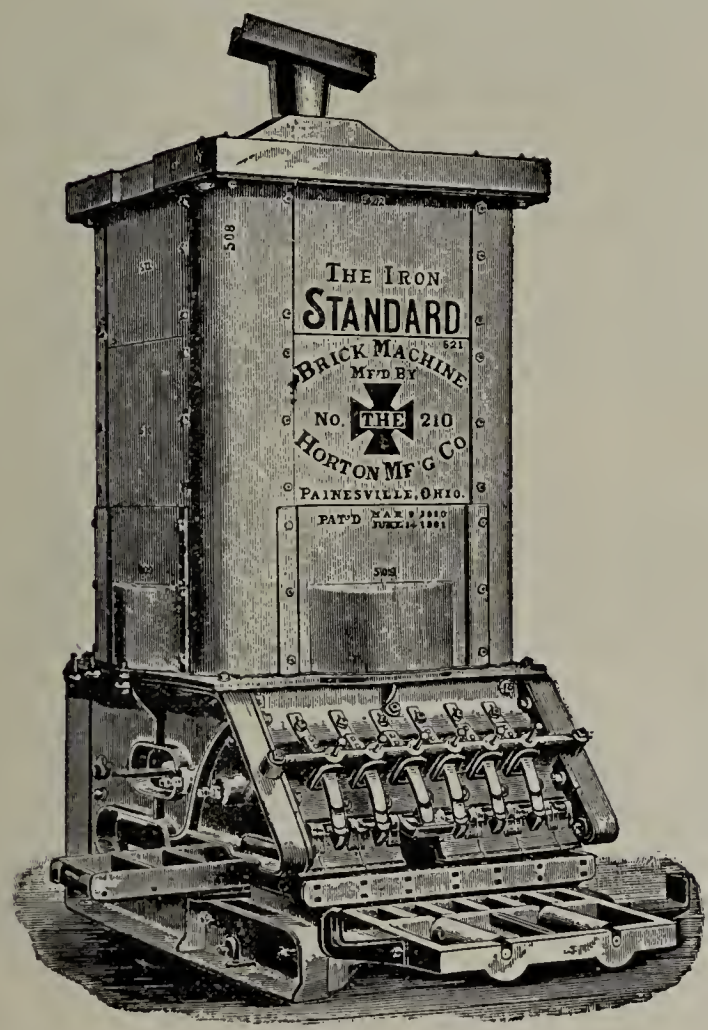
LANCASTER, PENN., U. S. A.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES



IRON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brick-yard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

Some Interesting Reading

As well as Fair Warning to All.

The Patents Owned by

C. & A. Potts & Co.,

Are declared Valid by The Highest Courts in Our Land.

Don't take chances of Purchasing other so-called Disintegrators, you are Liable to get into Trouble. You take no risk when Purchasing a POTTS. Neither of Infringements Suits or quality. They are The best on EARTH.

UNITED STATES CIRCUIT COURT,
Southern District of Ohio, Western Division.

C. AND A. POTTS AND CO.,
vs.
FRANK F. CREAGER,
HARRY M CREAGER and
JONATHAN CREAGER.
No. 4,244.
In Equity.

PERPETUAL INJUNCTION.

THE PRESIDENT OF THE UNITED STATES OF AMERICA
TO
Frank F. Creager, Harry M. Creager and Jonathan Creager, their clerks, attorneys, servants, agents and workmen, and any and all persons acting by, through or under the authority of said defendants or either of them.

WHEREAS, it has been represented to us in the Circuit Court of the United States for the Southern District of Ohio, Western Division, on the part of C. and A. Potts and Co., complainant, that it has lately exhibited its Bill of Complaint against you, the said Frank F. Creager Harry M. Creager and Jonathan Creager, defendants, to be relieved touching the matter therein complained of, in which Bill it is stated, among other things, that Letters Patent of the United States No. 322,393, for Improvements in Clay Disintegrators, were issued on July 14, 1885, in due form of law, to Clayton Potts and Albert Potts, and that said Letters Patent have been properly assigned to and are now owned by the said C. and A. Potts and Co., the complainant herein, and that you, the said Frank F. Creager, Harry M. Creager and Jonathan Creager, have infringed the rights secured by the aforesaid Letters Patent, by making and selling to others Clay Disintegrators embodying the invention set forth and claimed in the said Letters Patent, contrary to the form of the statutes in such cases made and provided, and that your said acts and doings in the premises are contrary to equity and good conscience.

Now, therefore, in consideration thereof, and of the particular matters in the said Bill set forth, you, the said Frank F. Creager, Harry M. Creager and Jonathan Creager, your clerks, agents, attorneys, servants and workmen, are strictly commanded and enjoined under the pains and penalties which may fall upon you, and each of you, in case of disobedience, that you forthwith, and **perpetually** hereafter until the expiration of said patent, absolutely desist and refrain from any further manufacture, sale or use in any manner of the patented improvements, or any part thereof, in violation of the rights of the said C. and A. Potts and Co. under the said Letters Patent of the United States No. 322,393.

Witness, the Honorable MELVILLE W. FULLER, Chief Justice of the Supreme Court of the United States, and the seal of the Circuit Court of the United States for the Southern District of Ohio, Western Division, this 27th day of March, A. D. 1900, and the one hundred and twenty-fourth year of the Independence of the United States of America.

B. R. COWEN,
Clerk.

[SEAL]

Received the writ at Cincinnati, Ohio, on the 28th day of March, 1900, and on the same day served the same on the within named Harry M. Creager and Frank F. Creager, by handing to each of them personally a true copy of this writ with all the endorsements thereon. And on the 30th day of March, 1900, I served the same on the within named Jonathan Creager by leaving a true copy of this writ with all the endorsements thereon at his usual place of residence, placing same in the hands of his wife.

V. J. FAGIN, U. S. Marshal S. D. O.
By W. J. Sanderson, Deputy.

Southern District of Ohio, Western Division. } ss.

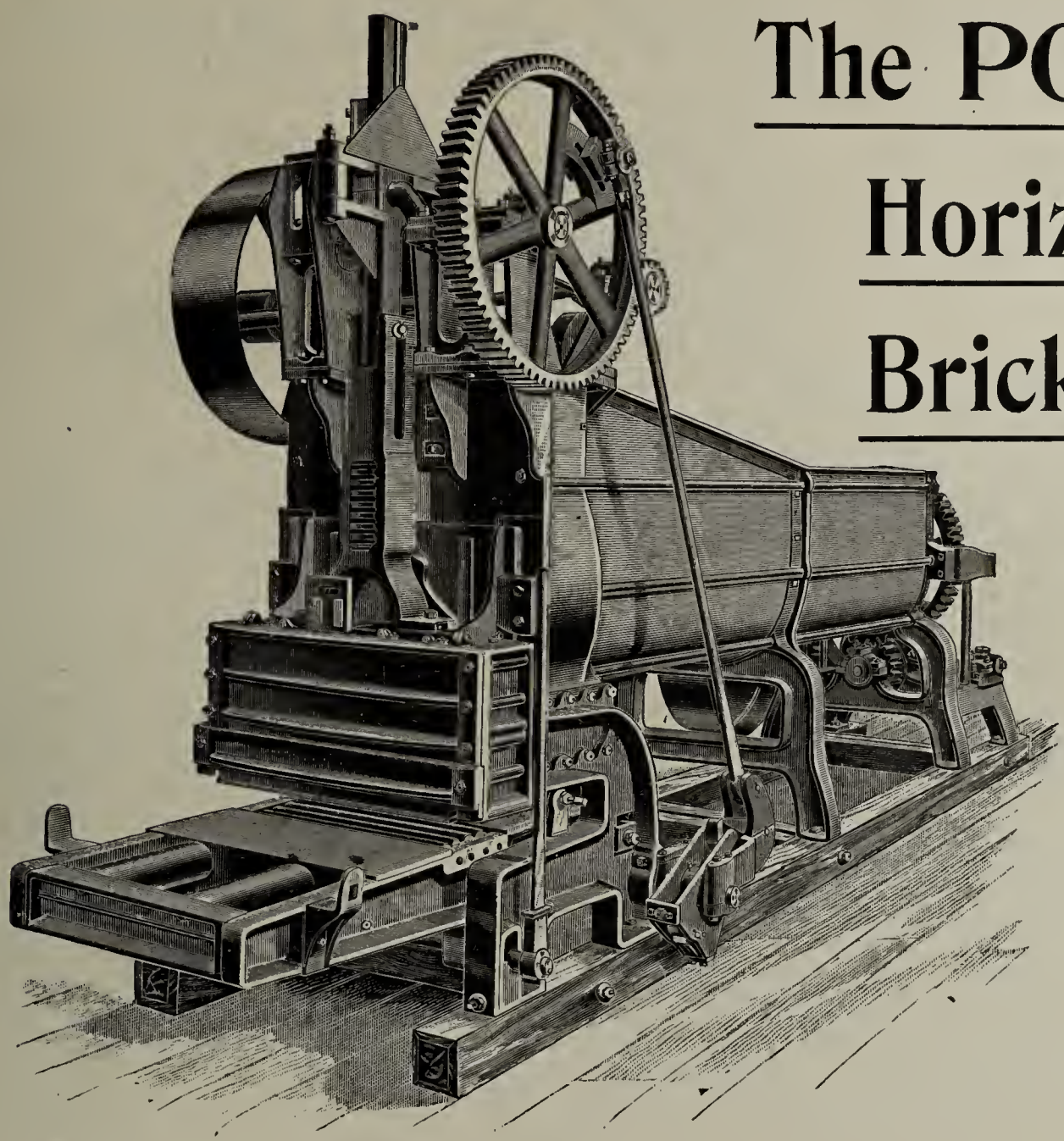
A true and correct copy of the original Perpetual Injunction on file in the Clerk's office of the United States Circuit Court at Cincinnati, Ohio.

Attest:
B. R. COWEN, Clerk,
By Robt. C. Georgi, Deputy.

MANUFACTURED ONLY BY

C. & A. POTTS & CO., = Indianapolis, Ind.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

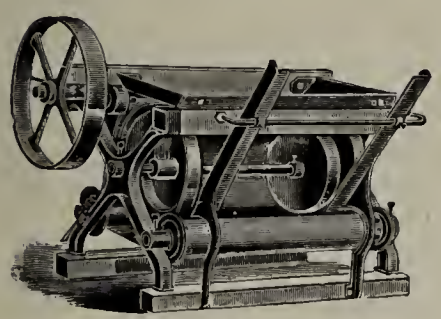
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

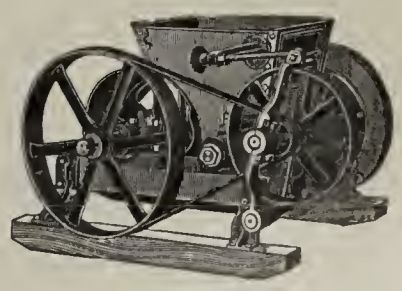
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



DISINTEGRATORS.

When in need of Machinery or supplies, we can save you money.

C. & A. POTTS & CO.,

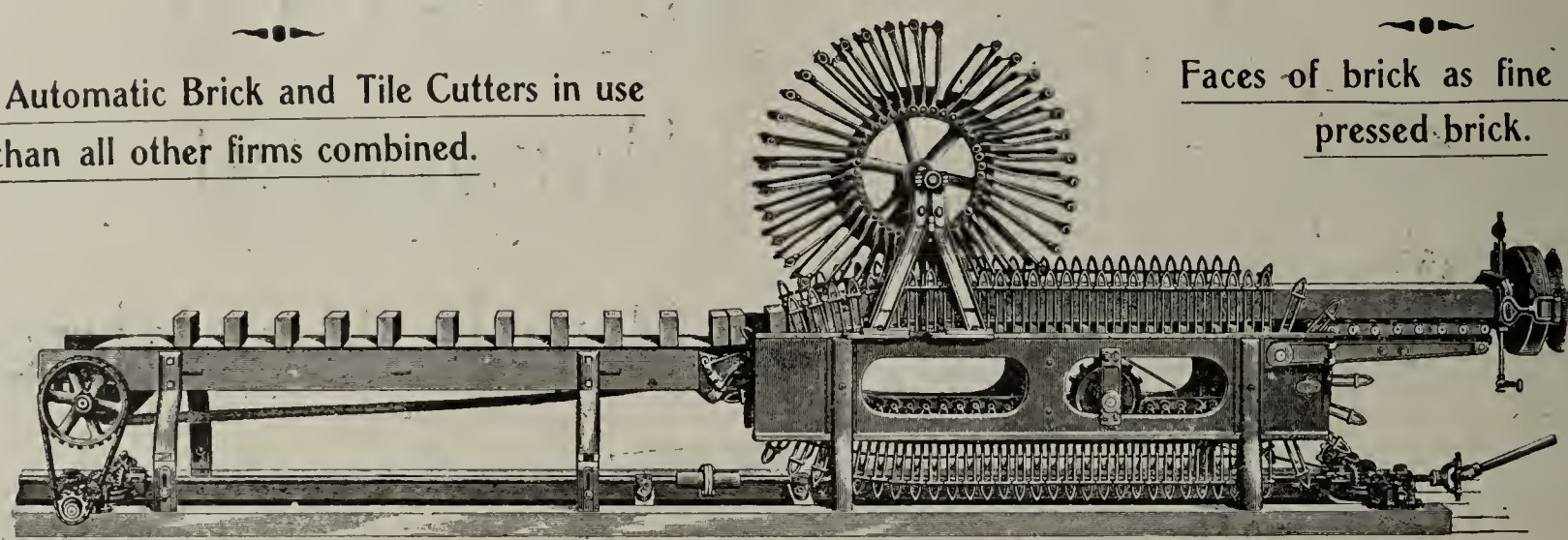
WRITE FOR OUR NEW CATALOGUE JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

The Only ABSOLUTE DOWN CUT Cutting Table on the Market.

More Automatic Brick and Tile Cutters in use than all other firms combined.

Faces of brick as fine as re-pressed brick.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Correct in principle and mechanism.

Simplicity itself—nothing can get out of order unless broken by carelessness.

Strong and of long life—all its motions being continuously rotary.

The parts work together without jarring.

There is no halt or hesitation—every motion is prompt and positive.

Requires no expert to keep it running or in repair.

The column of clay, assisted by friction, runs the table, but all movements are regulated by clay column. When the column goes, table moves, and stops when it stops.

Breaks less than one-tenth the cutting wires that others do, and if wires are broken may be easily replaced without stopping.

The brick cut are square and true, with sharp edges and corners, and equal to the finest Press Brick.

The first brick is as good as the last, and the last as the first.

Cutting capacity practically unlimited.

READ WHAT USERS SAY:

J. D. FATE & CO., Plymouth, Ohio. Memphis, Mo., October 12, 1899.

Gentlemen:—We have been using your **Automatic Side Cut Brick Table** for two years, and are now ready to tell you what we think of it. It is beyond a doubt the superior of any other cutter now on the market for fine work, regularity in operation, self adjustment to any capacity, and last of all, **Durability.** In using other cutters, we were obliged to use either oil or water to prevent the bar of clay from sticking to parts of the table. With your Automatic table we use nothing of the kind. We simply throw the clay into the machine and the machine does the rest. The brick are all cut even and with perfect face and edges, and are delivered onto the off-bearing belt in first class shape. Our table would cut 100,000 brick per day if we made them that rapidly, but adjusts itself to our 20,000 per day without any work on our part. Yours truly, MEMPHIS BRICK & TILE WORKS.

J. D. FATE & CO., Plymouth, Ohio. Salt Lake City, Utah, October 11, 1899.

Gentlemen:—Yours of the 3rd inst., at hand and contents noted. In regard to the **Automatic Side Cut Brick Table** purchased from you in June last, would say that we deem it **Perfection Itself.** We make from 35,000 to 60,000 brick per day, as our needs require. This by increasing or lessening the speed—the result from either speed is the same in quality. Our material is pulverized, screened and pugged, and works smooth and after the brick are cut they are delivered onto the off-bearing belt in a perfect condition, at either speed, all of one size, well defined edges and no delay from broken wires. We would not part with the system under any **Circumstances.** We cheerfully recommend it to all brickmakers. Yours truly, THE SALT LAKE PRESSED BRICK CO.

J. D. FATE & CO., Plymouth, Ohio. Des Moines, Iowa, May 11th, 1899.

Gentlemen:—We are so well pleased with the Automatic Side-cut Brick Machine that we purchased from you this Spring that we feel it our duty to send you a testimonial. We feel safe when we say it has no equal, but we are sure when we say it has no superior, because it is perfect when it comes to making a nice, square brick. We have tried it in all kinds of clay that we have here, and it makes no difference, it runs just the same. We can now make a fancy face brick, which we could not do before. We do not use power to drive the wheel—the column of clay runs it nicely. We feel that it is the best investment we ever made. If you have any prospective customer in our neighborhood, send him to our yard to see the machine, and we will venture to say he will buy your machine.

Very respectfully yours, NEWMAN BRICK & COAL CO.

"Soft Mud" Brick Machinery, both Steam and Horse Power in addition to our full line of "Stiff Mud" Machinery. Ask for Catalogue and Prices.

J. D. FATE & CO.,

Manufacturers of

BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.

Agent for Virginia and North Carolina: H. L. JACOBS Suffolk, Va.

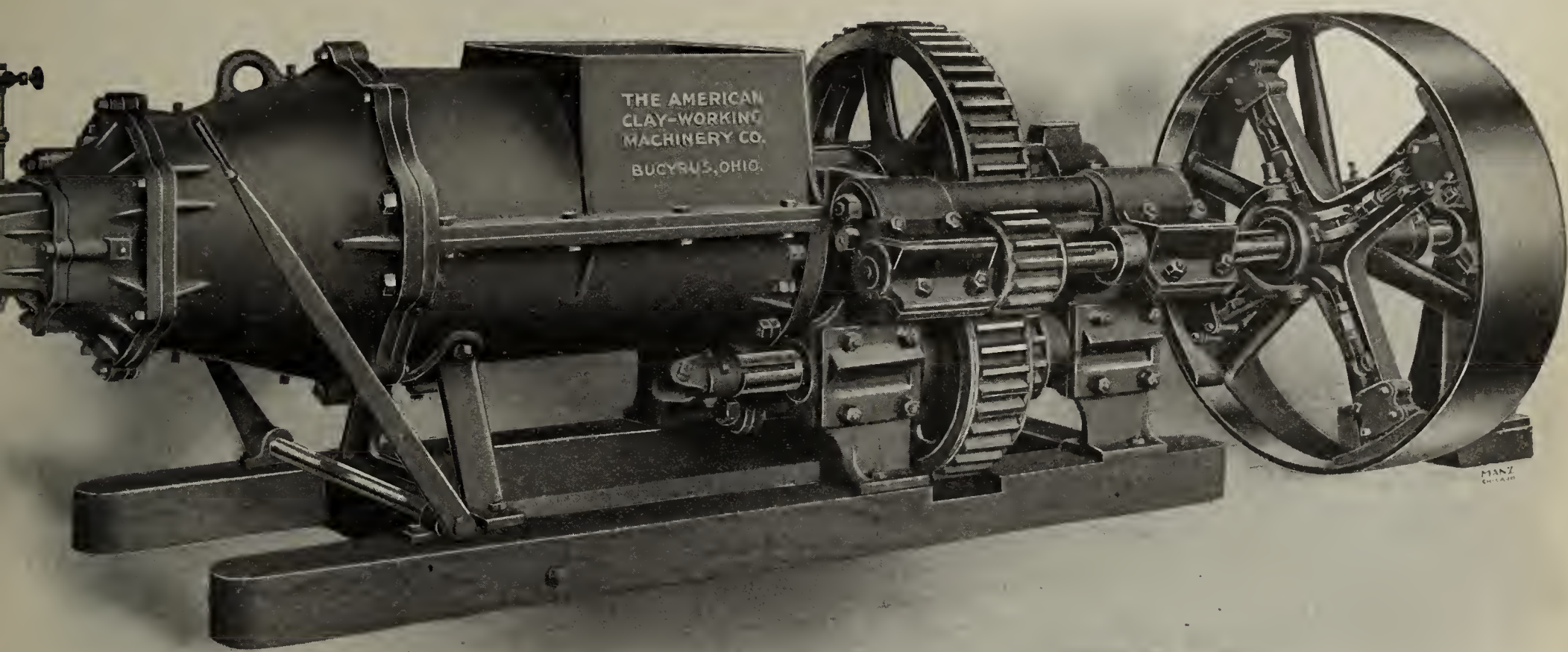
Keep in Line....

Keep in line. That's what we have been doing for years past.————Keeping right in line with the procession of progress until it has placed us on that

PINNACLE OF LEADERSHIP

and progressiveness, anxiously sought for by many but attained by few.

One of our products of watchfulness, study and consideration for the demands of the modern brick maker is the



Giant Auger Brick Machines.

They are built like the Rock of Gibraltar. No strengthening factor has been lost sight of. No feature for increased out-put has been overlooked. No point to improve quality of product has been untried. Once proven a success, all points to better the machine have been embodied in its construction until it is to-day without an equal in the production of perfect brick in quantities away ahead of all competition. If the demands of your market are such as to merit the installation of a Giant machine, it will be money in your pocket to start the improvement at once. It costs nothing to consider the matter. We're here to answer questions, furnish information and advise you disinterestedly. We can't afford to do otherwise because if you are not satisfied we lose a customer and friend. We want your custom but we value your friendship more.

The Giant machines are built in three sizes; The Special and Nos. 1 and 2. The Special has a capacity of from 5,000 to 10,000 brick per hour. No. 1 has a capacity of 3,500 to 5,000 perfect brick per hour. No. 2 produces from 2,500 to 3,000 standard size brick per hour. These are perfect machines. The kind that make a reputation and hold it. We build a dozen other sizes and styles of auger machines of varying capacity, but all the best in their class.

Write for particulars on these and other clay-working machinery.

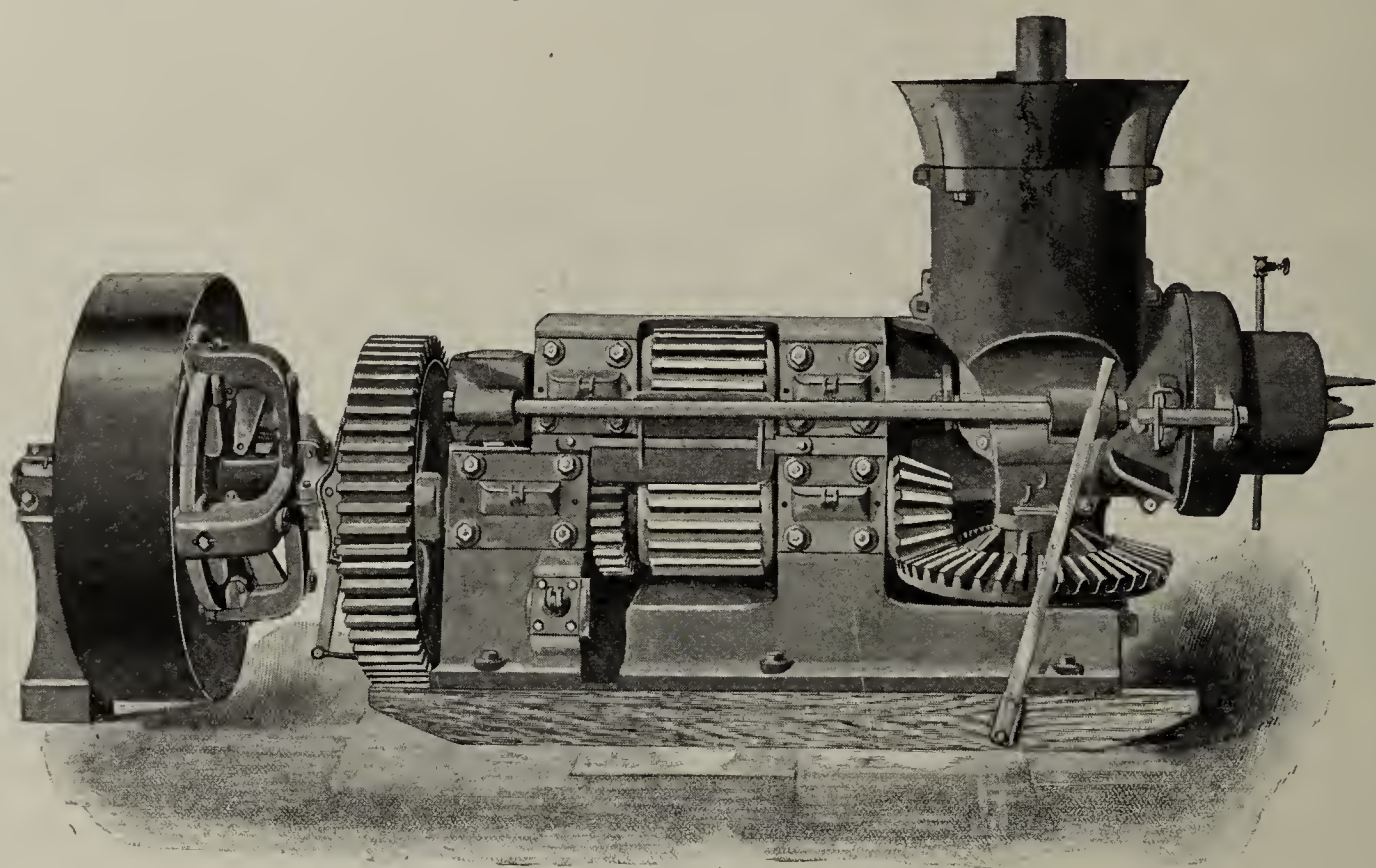
THE MACHINERY THAT NEVER DISAPPOINTS

The American Clay-Working Machinery Company,

BUCYRUS, OHIO, U. S. A.

The WONDER

IN WORK AS WELL AS IN NAME.



BIG WONDER BRICK MACHINE: Capacity 60,000 Brick Per Day.

The wise man is guided in his choice of an article largely by the adaptability of same for his particular purpose.

There is something about the **Wonder Brick Machine** that appeals to the practical brickmaker. When you examine the machine you will see why, and when you use one, you will have no other.

Our strength is in our preparedness. We are in a position to handle anything that you may intrust to us in a way that will throw new light on the matters of service and quality of work.

The Wallace Mfg. Co.,

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

Frankfort,
Indiana.

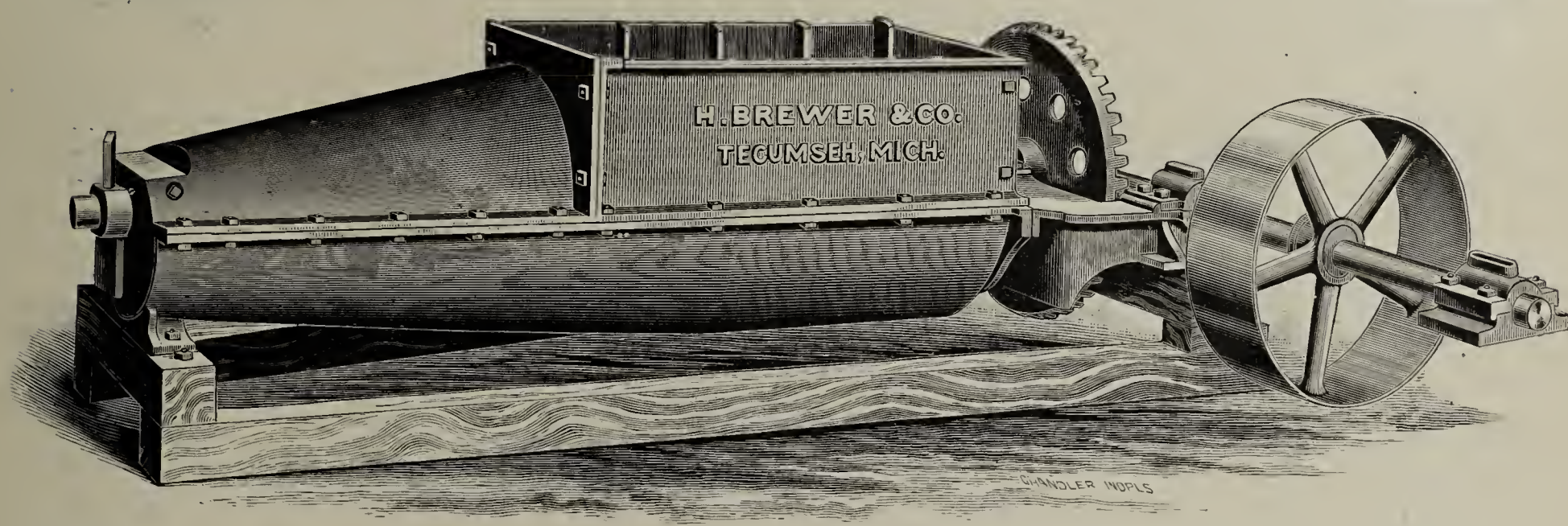
SOUTHERN AGENT: Frank H. Reid, Charlotte, N. C.

A Pug Mill

Which possesses all the advantages of an Open Top Mill for feeding and tempering and of a closed top for pugging and grinding.

THOSE WHO USE THEM LIKE THEM

And never yet has one failed to please.



No. 1 PUG MILL.

Do You Grasp the Idea?

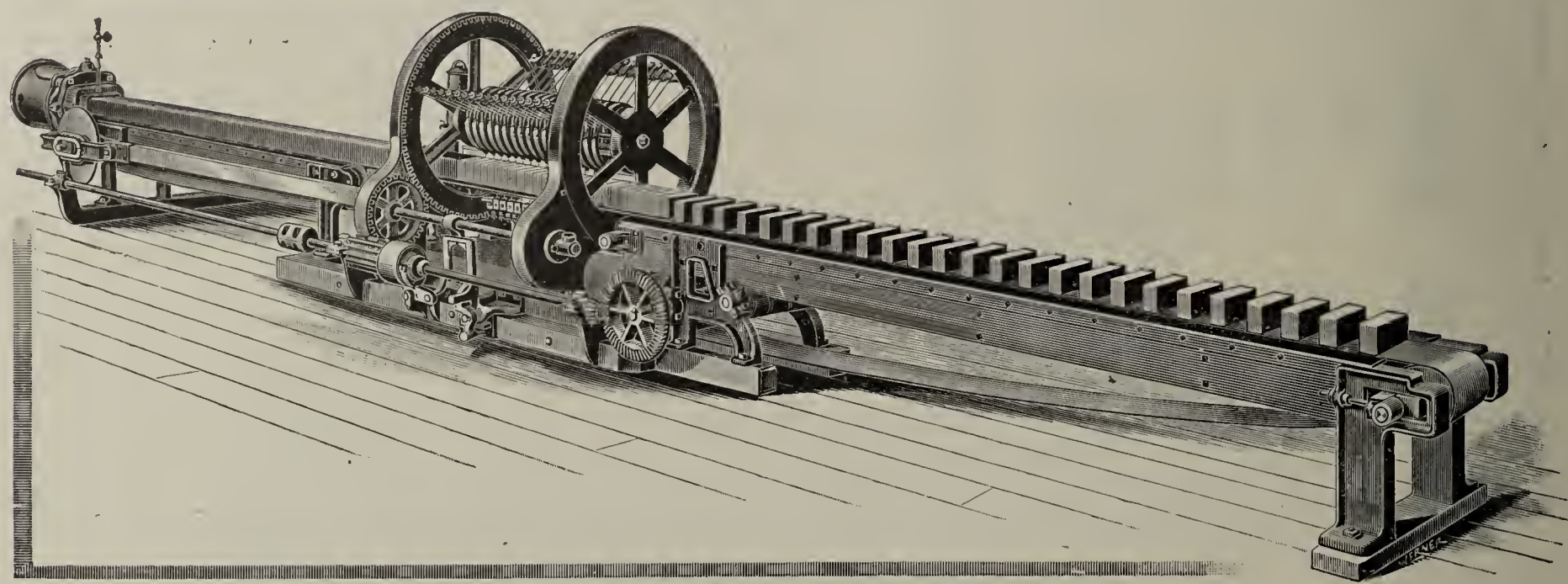
We manufacture Clayworking Machinery in great variety and should be pleased to correspond with you concerning anything you may need in that line.

H. BREWER & CO.,

TECUMSEH, MICH., U. S. A.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

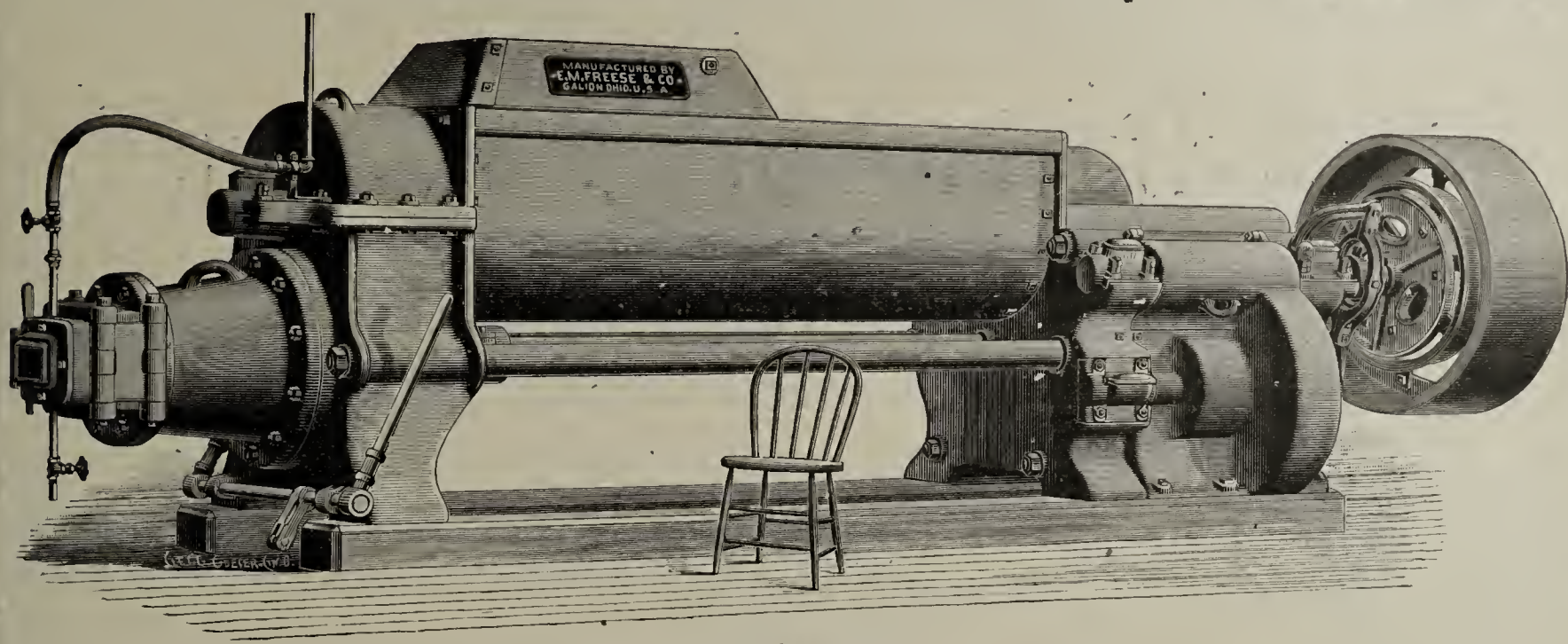
POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

E. M. FREESE & CO.,

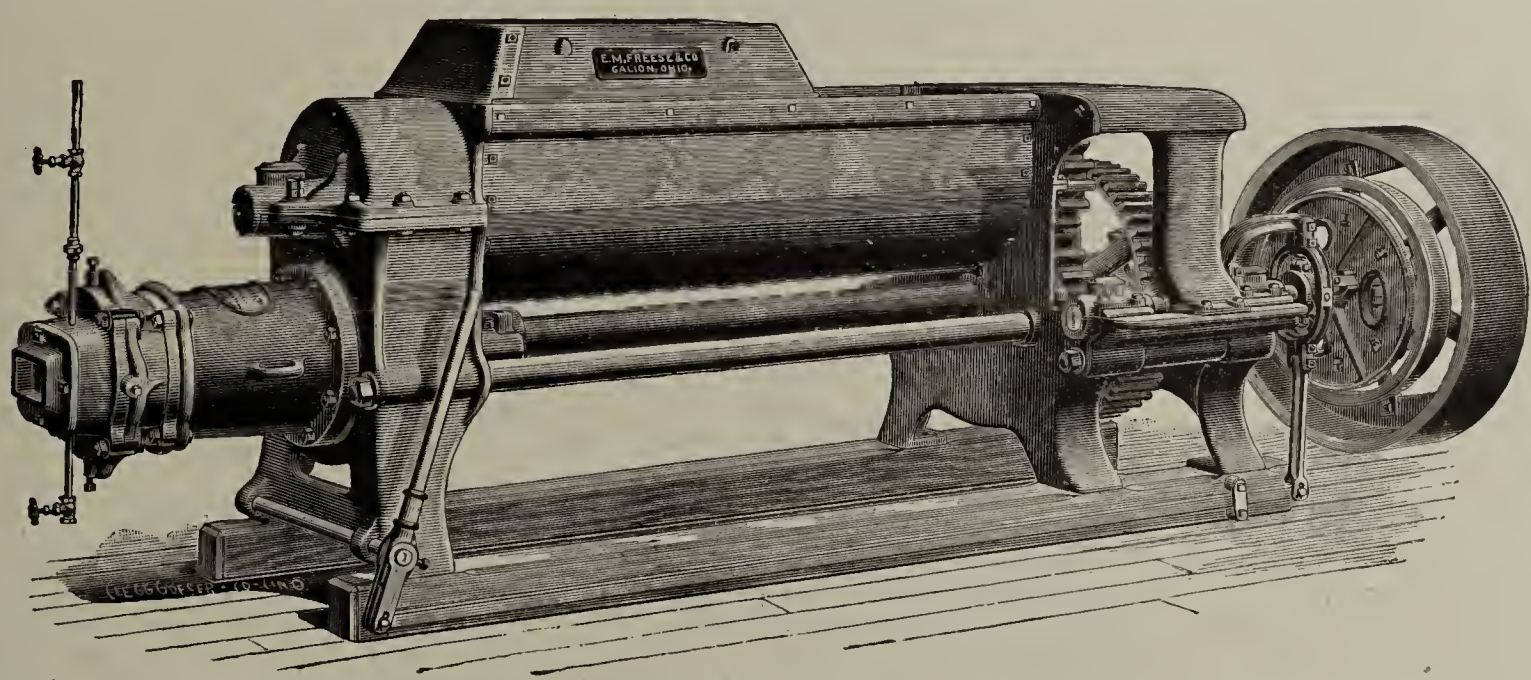
Galion, Ohio.

The Original Union Brick Machines



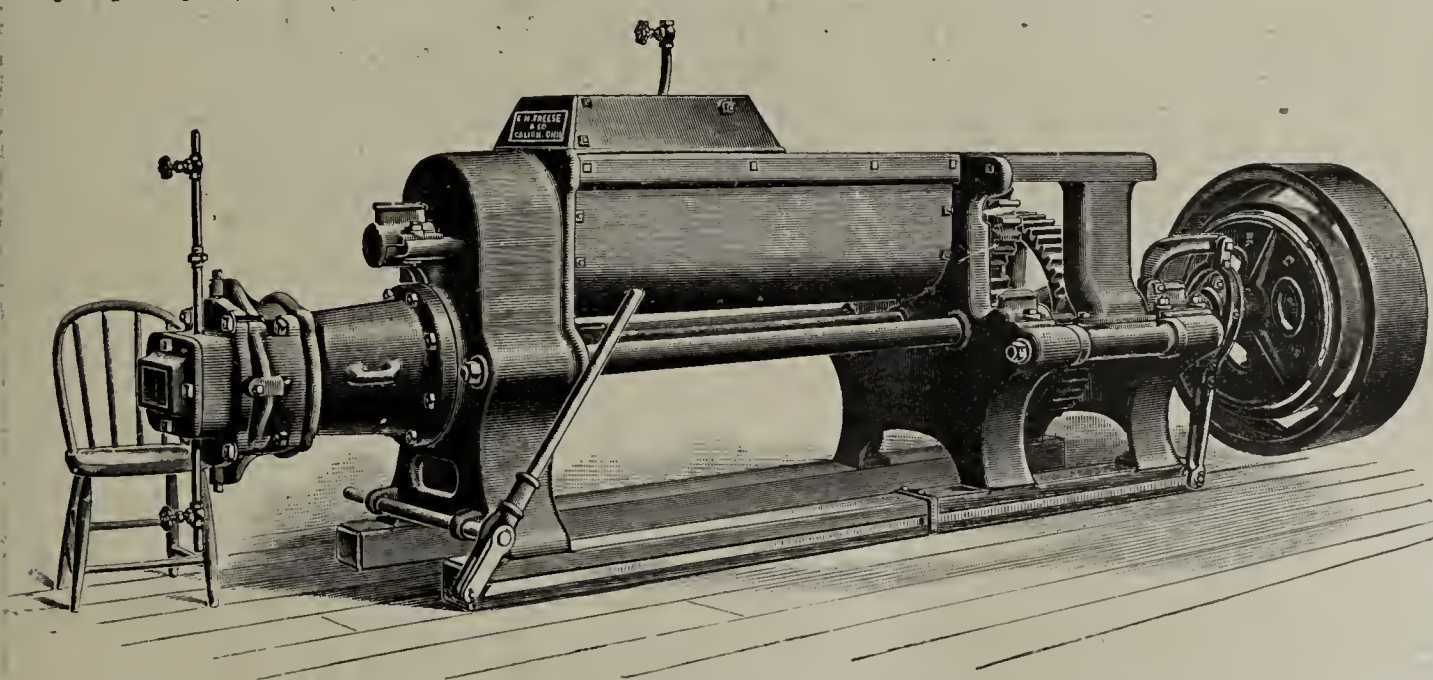
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

E. M. FREESE & CO., Galion, Ohio.

The PEOPLE WHO BOUGHT

"New Haven" Brick Machines

DIDN'T BUY them for their beauty alone, nor even because they were cheap. They bought them because they wanted machiney that would do the right thing all the while, without any fuss or bother of breaking down when wanted most.

THIS SHOWS THAT THEY GOT WHAT THEY WANTED.

ONLY ONE BREAK DURING FIFTH SEASON.

That was caused by large Stone.
Makes 40,000 Brick per day.

—●—

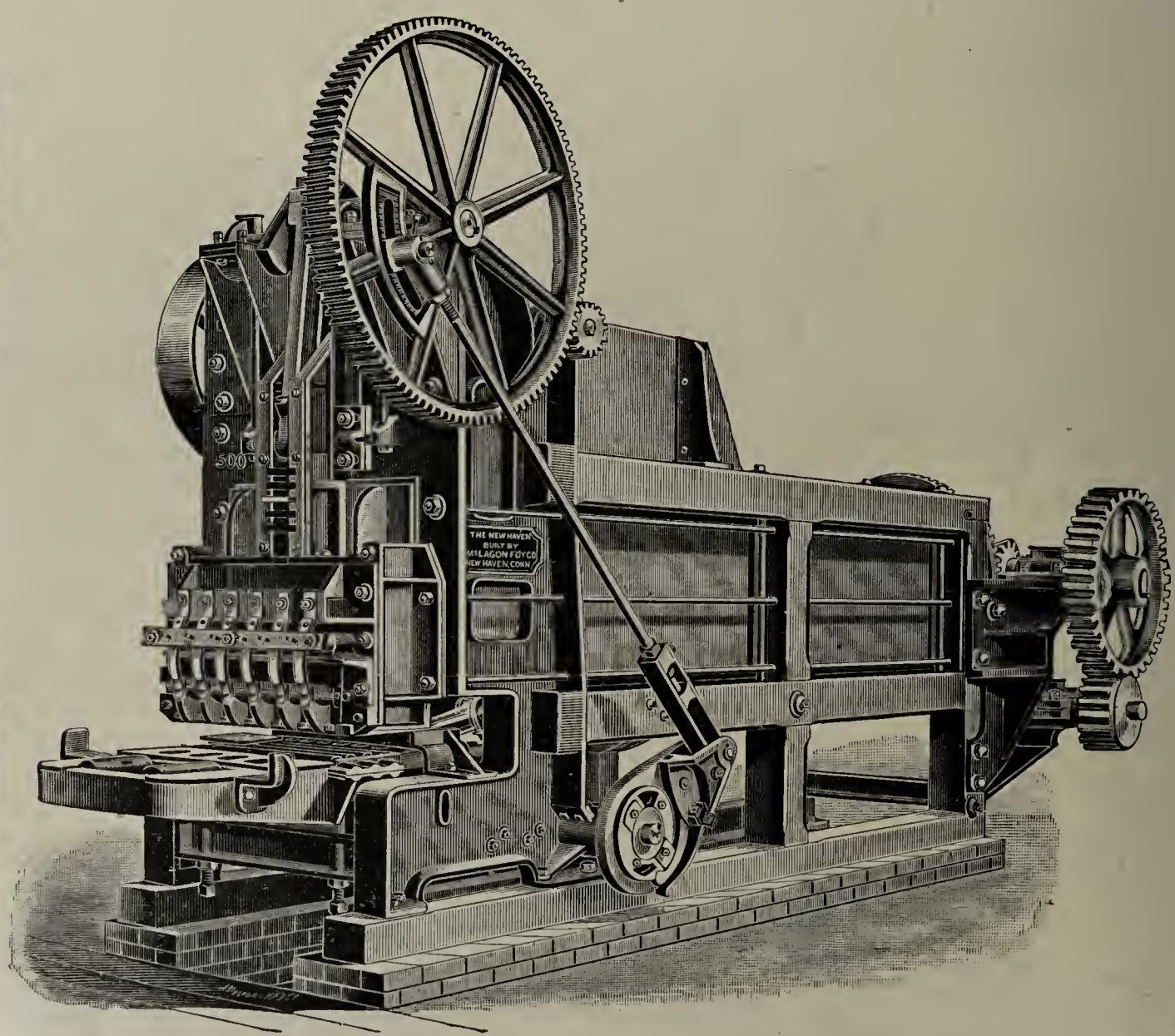
CHICOPEE, MASS., Oct. 14, 1899.

THE EASTERN MACHINERY CO., New Haven, Conn.

Gentlemen:—In answer to your inquiry about the machine, would say it has beaten its record this season, as we **have had but one break,** and that one a knife, **caused by a large stone getting into the tub.**

We think this a good showing for the "New Haven" Machine.

Yours truly,
BESTON & KELLEY.



Built Only by

The Eastern Machinery Co.,

NEW HAVEN, CONN.

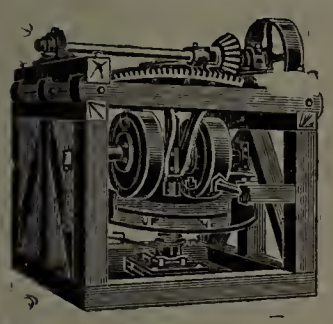
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

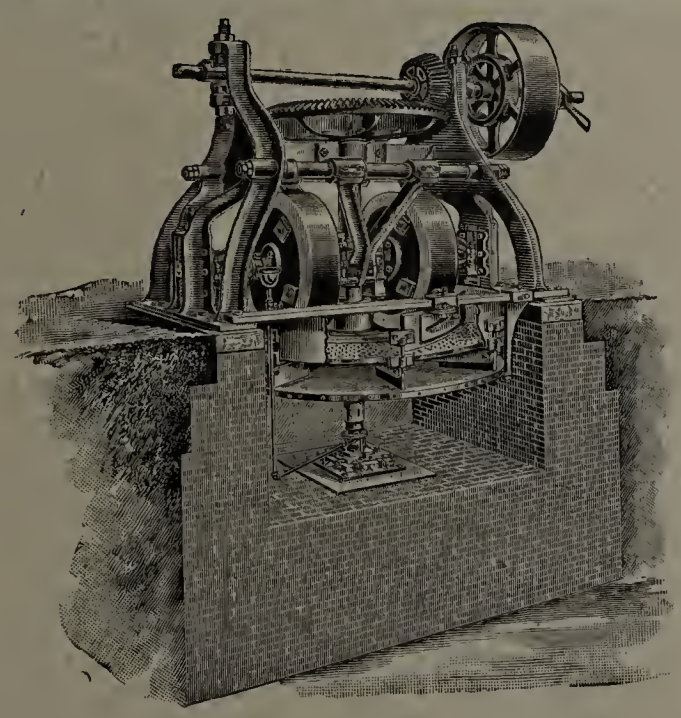
MANUFACTURERS OF

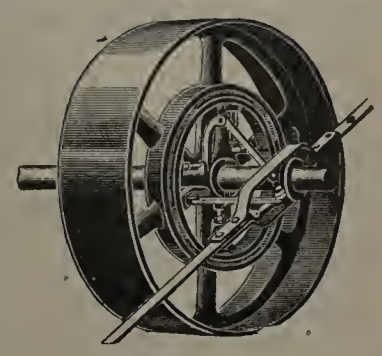
Brick Machinery.

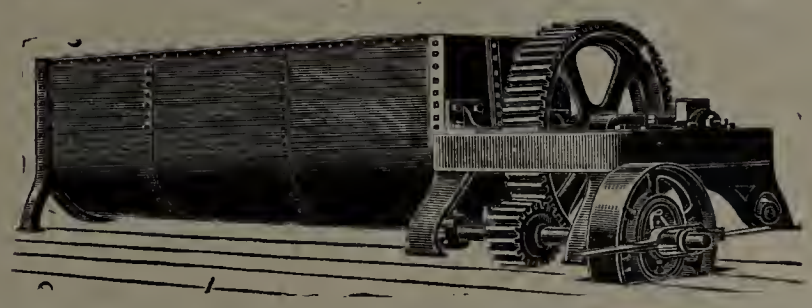
COMPLETE EQUIPMENTS.

Tile Machinery.









Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

A Few Facts

About the
"A. B. C." BRICK DRYER.

It will enable you to run the year round, despite weather conditions. It will enable you to make and dry your brick for 20 cents a thousand or less. It will dry your brick without injury.

Catalogue on request.

American Blower Company,
Detroit, Michigan.
New York. Chicago. London.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS,
OHIO, U. S. A.

MANUFACTURERS OF
ALL KINDS OF

Clayworking Machinery.

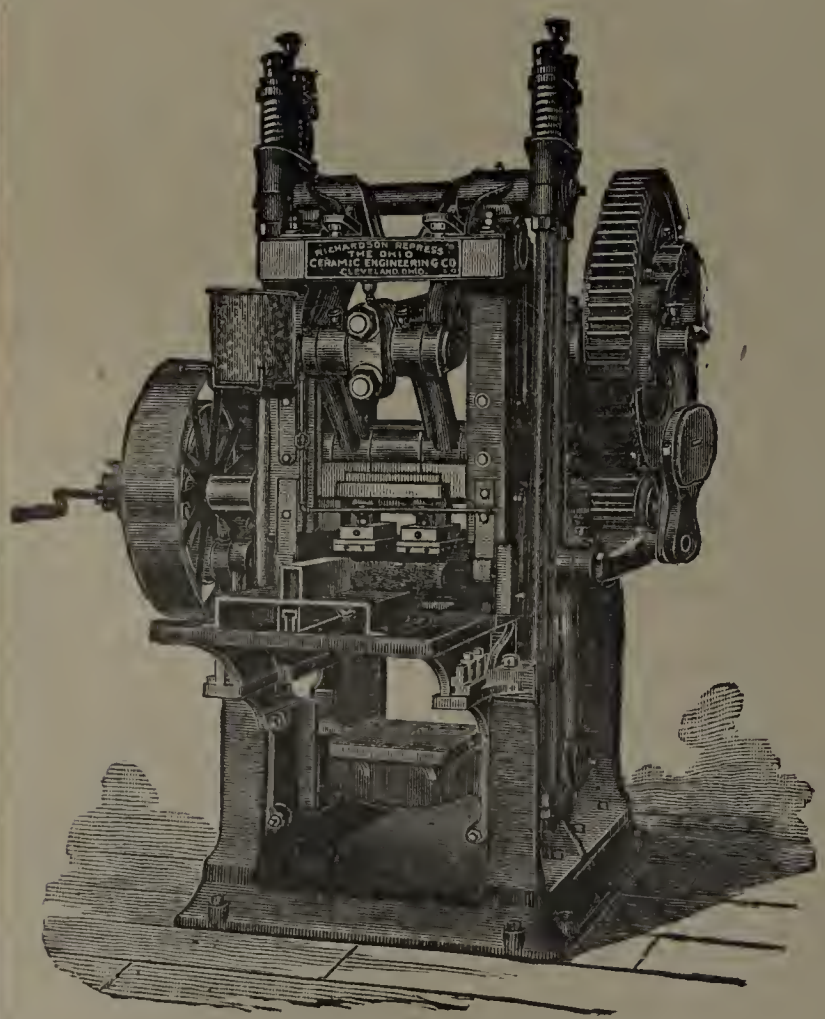
The accompanying cut shows our improved machine for making

Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



The RICHARDSON REPRESS.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

If it won't do what we say it will do, Return it.

These are our instructions to buyers of the RICHARDSON REPRESS.

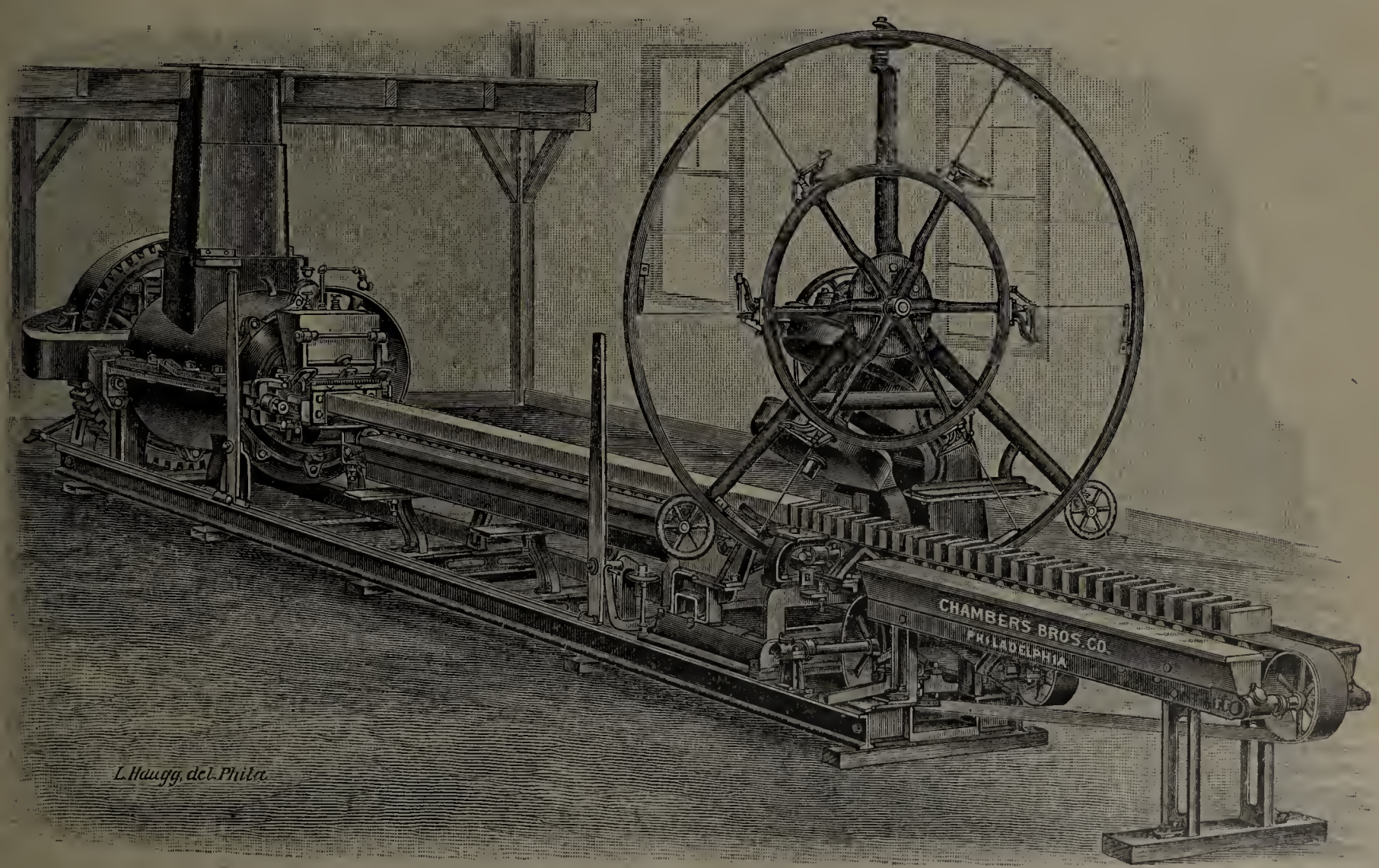
The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

Table of Contents, Page 468.

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII, No. 5. INDIANAPOLIS, IND., MAY, 1900. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

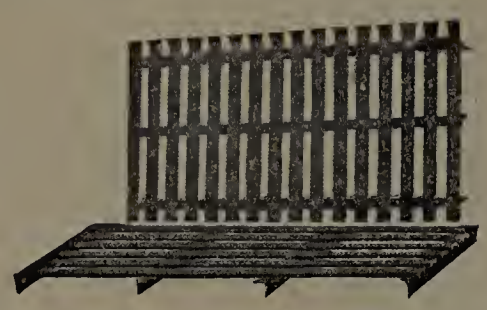
We are the Largest Manufacturers of Dryer Cars in the World.

Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.

No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.

No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name. Page.
American Clay-Working Mach Co, The..... 475 502, 503
Anderson Foundry and Mach. Works.....420, 421
Chicago Brick Machinery Co... 422
Fernholtz Brick Machinery Co. The 425
Progress Press Brick and Machine Co..... ..
Ross-Keller Brick Machine Co ..

Brick and Tile Machinery.

Adrain Brick & Tile Machine Co 489
American Clay-Working Mach Co., The.....475 502, 503
Anderson Foundry and Mach. Works..... 420, 421 490
Baird and Son, H. C..... 481
Brewer. H. & Co..... 500
Chambers Brothers Co..... 417
Chicago Brick Machinery Co... 422
Eastern Machinery Co, The.... 506
Fate & Co., The J. D..... 501
Freese, E. M. & Co.....504, 505
Henry Martin Brick Mach. Mfg Co, The 49
Hensley, J. W..... 419
Horton Mfg Co, The 495
Kells & Sons 481
Leader Mfg. Co, The..... 491
Madden & Co..... 480
Ohio Ceramic Engineering Co., The..... 508
Ohio Machine Co..... 484
Potts & Co., C. & A..... 496, 497
Prangley, James 490
Raymond Co., The C. W.... 469, 471
Stedman Foundry and Machine Works..... 424
Steele, J. C., & Son..... 488
Stevenson & Co..... 507
Taplin, Rice & Co..... 424
Wallace Mfg. Co, The..... 499
Wellington Machine Co, The... 473
Wiles Co., A. M. & W. H 488

Brick Kilns and Dryers.

Alsip, S. H 479
American Blower Co, The..... 508
Barron, A. F 472
Bushong, M. M 492
Eudaly, W. A 492
Haigh, H..... 485
Illinois Supply and Construction Co, The..... 493
Morrison & Co., R. B 485
Phillips, S. G..... 479
Pike, E. M..... 482
Reppell, L. H 485
Swift, F. E 485
Standard Dry Kiln Co, The..... 426
Yates, Alfred..... 482

Brick Yard Supplies.

Atlas Bolt & Screw Co, The..... 418
Arnold, D. J. C 489
Buhl Malleable Company..... 480
Cleveland Car Co..... 494
Caldwell & Son Co., H. W..... 479
Carmichael, T. W..... 481
Carnell, Geo..... 488
Coldewe & Co., G..... 484
Cox, Geo. S..... 484
Duplex Heating & Machine Co. 489
Elder & Dunlap..... 484
Frost Engine Co 423
Hardin & Gray..... 483
Harrington & King Perforating Co, The 419
Henry Martin Brick Machine Mfg. Co, The..... 498
Horton Mfg. Co, The..... 495
Jeffrey Manufacturing Co, The. 483
Kendall & Flick..... 478
Marion Steam Shovel Co..... 491
Murray Iron Works Co., The.. 477
Main Belting Co 478
Mershon & Co., W. B 482
Newton, A. H..... 483
Newton A. C..... 483
Phillips & McLaren 482
Rockwood Mfg. Co, The..... 480
Turner, Vaughn & Taylor Co... 508
Vanduzen Co., The E. W 482
Williams Patent Crusher and Pulverizer Co 425

Miscellaneous.

Burt Manufacturing Co..... 468
Chesapeake & Ohio R. R..... 483
Clinton Paving and Building Brick Co., The..... 487
Coaldale Brick & Tile Co., The. 486
Cotton Belt Route 484
Columbia Improvement Club. 485
Dean Bros. Steam Pump Works 481
Evens & Howard 481
Gabriel & Schall..... 481
Green & Hunter Brick Co..... 486
Harper-Norton Shale Brick Co The..... 486
Indianapolis Engraving and Electro Co..... ..... 482, 483
Indiana, Decatur & Western ... 484
Indiana Paving Brick & Block Co..... 486
Lake Erie & Western..... 484
Miller Oil and Supply Co 482
McAvoy Vitrified Brick Co 487
New York Brick and Paving Co 486
Osborne, W. R..... 482
Outing Mfg. Co..... 477
Preston Brick Co..... 487
Pennsylvania Line..... 483
Pittsburg Tubular Steel Whiffletree Co..... 472
Purington Paving Brick Co, The 487
Terre Haute Brick and Pipe Co. 487
Vandalia Line..... 483
Wabash Clay Co., The..... 487
Ads., Small Wanted, For Sale, etc.

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

Samples or blue prints with prices furnished on request.

THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

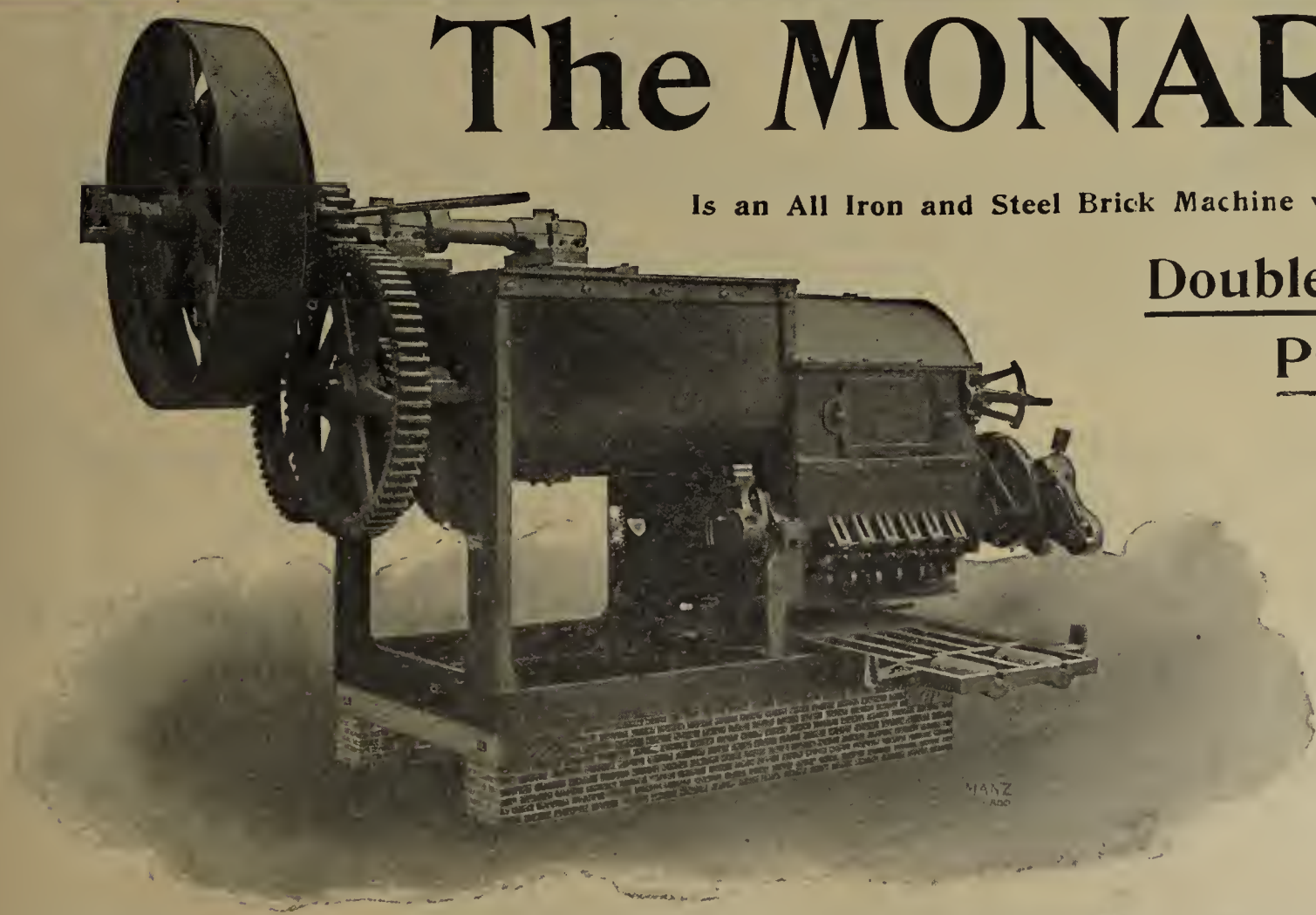
Is an All Iron and Steel Brick Machine with

Double Pug Mill.

• • •

SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •



Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

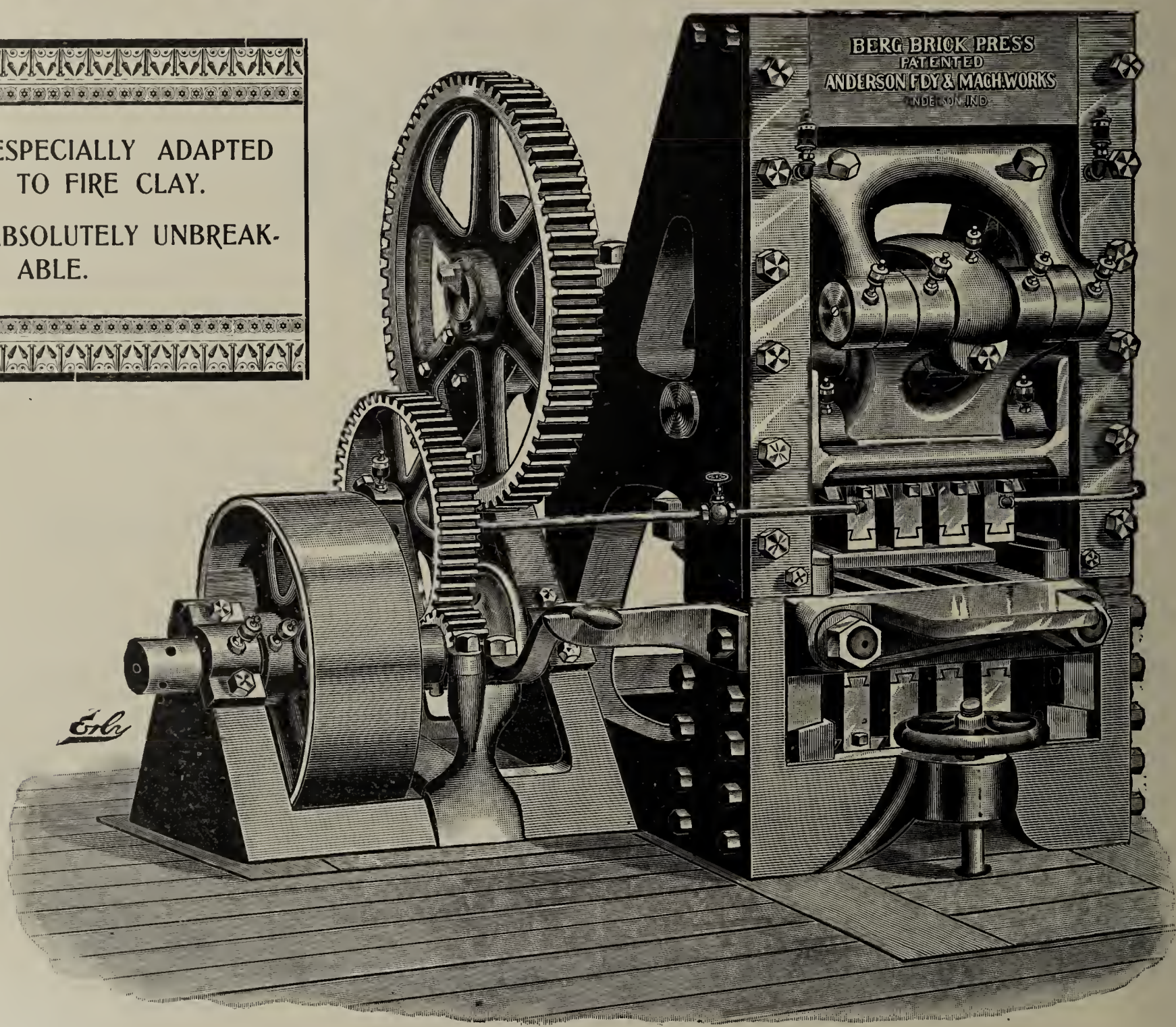
JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

A BIG BLUFF.

ONE of our esteemed competitors is trying to create the Impression in the Trade that our Berg Press infringes their patents; but this is Simply a Bluff, and **a Bluff is Only Good until it is Called.**

The following letter from the Inventor of the Machine which it is claimed we infringe should be sufficient to "Call" any Bluff of this kind:

COPY.

September 30, 1899.

John J. Moroney, 225 Dearborn Street, Chicago:

Dear Sir—I have carefully examined the Berg brick press, built by you, and have compared it with all the patents pertaining to brick presses issued to B. C. White and to J. A. Boyd and B. C. White jointly. All of the above patents are owned by the Chisholm, Boyd & White Company, and comprise the only brick press patents owned by said company up to January, 1898. The Boyd brick presses are built under these patents.

I do not find that the Berg press infringes any claim ofany of the above patents, and I see no way in which a suit against the Berg press or its builders or users could be successfully maintained by the owners of the White or Boyd & White patents.

In making this statement I take into consideration the prior state of the art, whereby a number of the claims allowed to White & Boyd and to White are limited to such an extent that they do not cover your machine.

The Boyd brick presses are all machines of my own design and invention in every important particular.

In conducting a long patent litigation involving these patents, I made a thorough examination of all patents relating to brick presses, and am therefore qualified to make the above statements without fear of succesful contradiction.

I am, yours truly,

(SIGNED) B. C. WHITE.

THE fact that we are selling these Berg Presses faster than we can build them, and are selling the majority to old dry press brickmakers, shows the trade recognizes that the above claim is nothing but a bluff and has no foundation in fact. Every purchaser of a **Berg Press** is given **Ample Security,** satisfactory to himself, to protect him against all possible costs or trouble arising from any patent litigation on account of the use of this machine.

MANUFACTURED BY

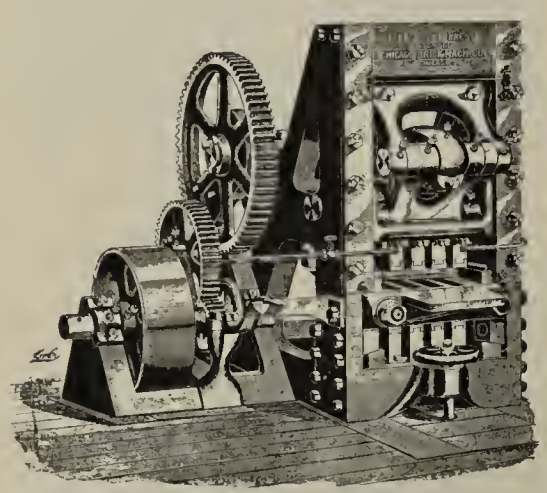
The Anderson Foundry and Machine Works,

Anderson, Indiana.

Sold by CHICAGO BRICK MACHINERY CO., 225 Dearborn St., CHICAGO.

When Buying a New Machine

Why not get it strictly **Up-to-Date.** In no other line of industry, excepting perhaps the electrical, has there been so many and such radical improvements during the past few years as in Clayworking Machinery The dull times have been utilized to good advantage in perfecting our machinery, and the buyer of to-day gets the benefit. Why put in a Back Number, when an Up-to-Date Machine costs no more?



Dry Press Machinery.

Our BERG PRESS is the simplest and strongest of all Dry Presses. Three distinct pressures; absolutely unbreakable in pressing clay. Makes Shape Brick as easily as Standards, and is making in regular work blocks 18x13 inches. Specially adapted to Fire Brick and Fire Clay Shapes. **Fully Guaranteed** in every respect.

Send for Special Dry Press Circular.

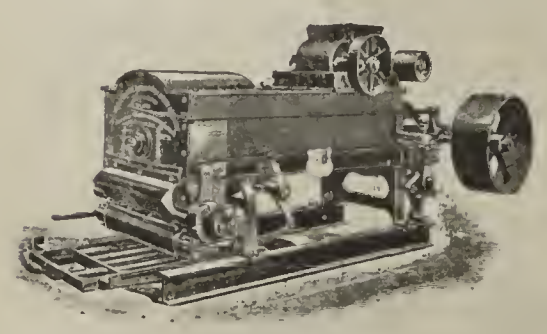
Stiff Clay Machinery.

Our WONDER BRICK & TILE MACHINE is the most modern and improved type of Auger Machinery. Turns clay at Right Angles while in motion, breaking up and destroying laminations. Specially designed dies and augers to prevent laminations. Works many clays that cannot be worked on other auger machines.

Built in four sizes, capacities up to 100,000 per day. Makes Drain Tile equally well and equally rapidly.

Full Line of Cutting Tables, Crushers and Stone Separators, Pug-Mills, etc., adapted to all kinds of clay.

Send for Special Illustrated Catalogue.



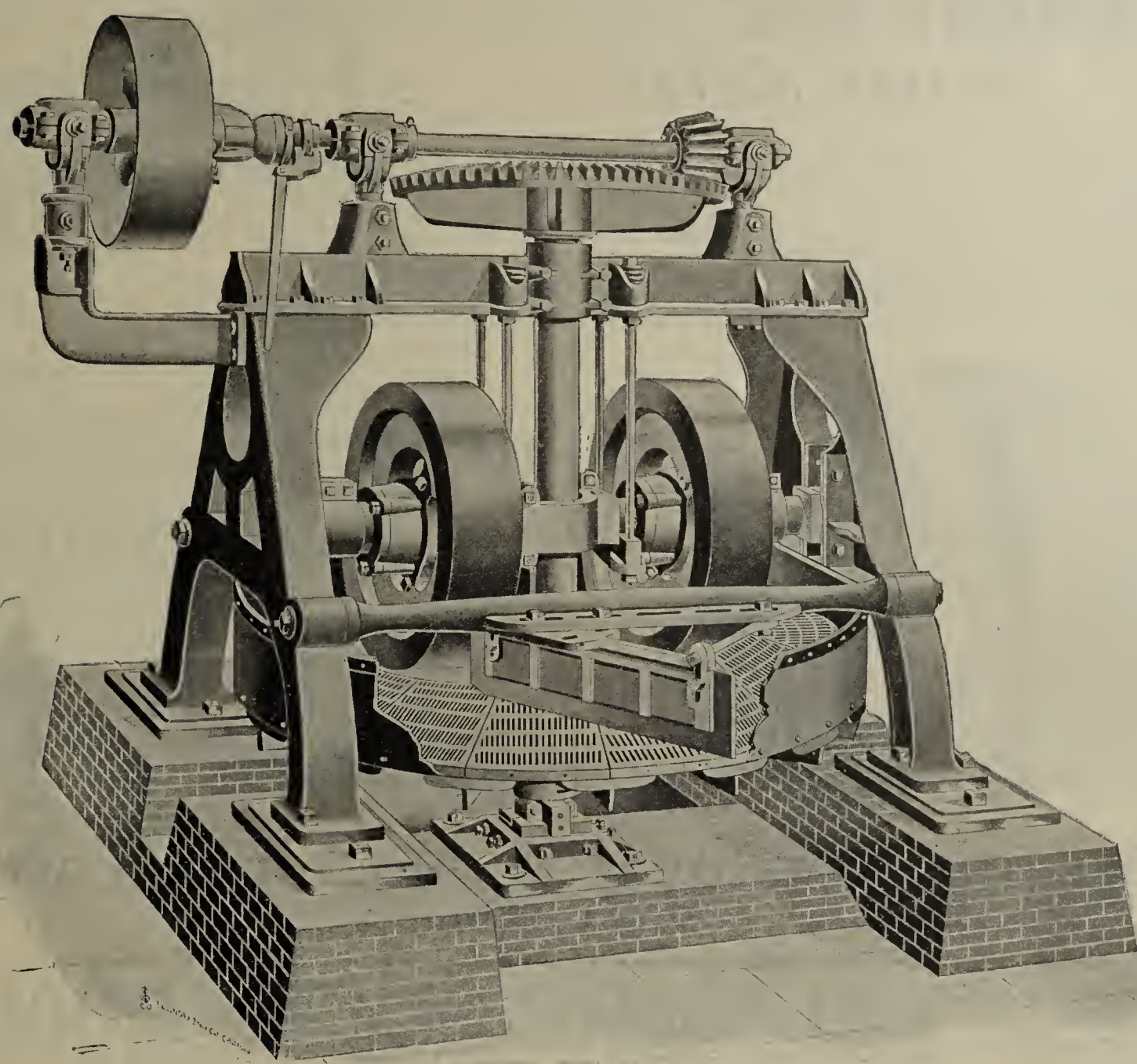
Soft Clay Machinery.

Our HORIZONTAL COMBINATION MACHINE is the latest and highest development of the Soft Clay System for making Sand Molded Brick. Works clay direct from bank, doing away with all soak pits and tempering.

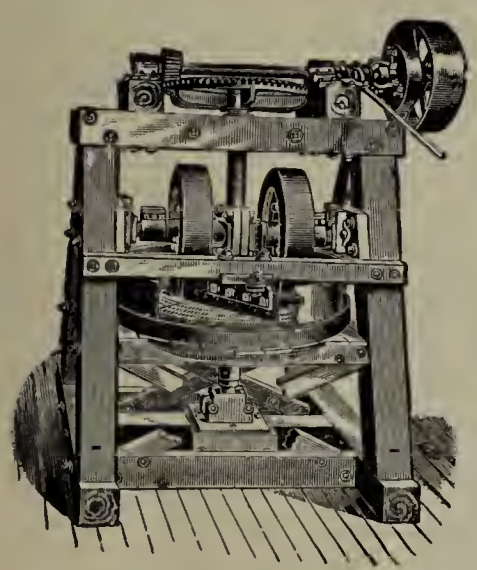
We also have Upright Machines for working clay that has previously been soaked, and Horse Power Machines for small yards.

CHICAGO BRICK MACHINERY CO.,

Send for Illustrated Catalogue. **225 Dearborn Street, CHICAGO, ILL.**

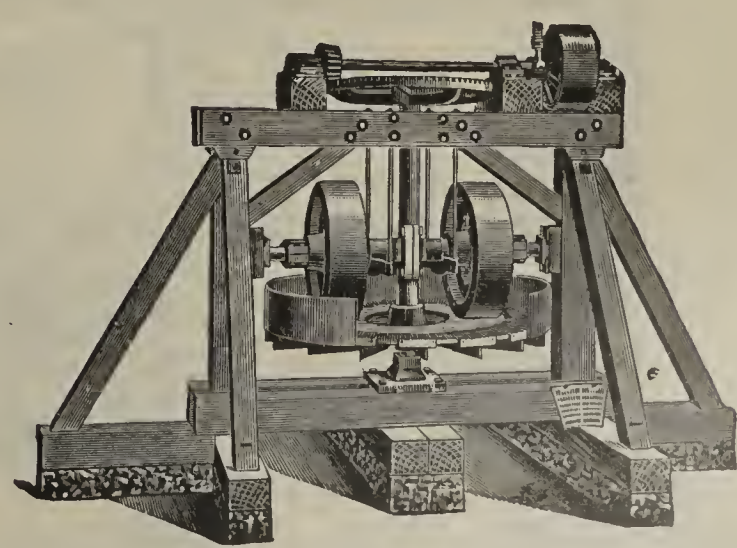


OUR SPECIALTY IS **DRY PANS.**



IRON FRAMES,
WOOD FRAMES.

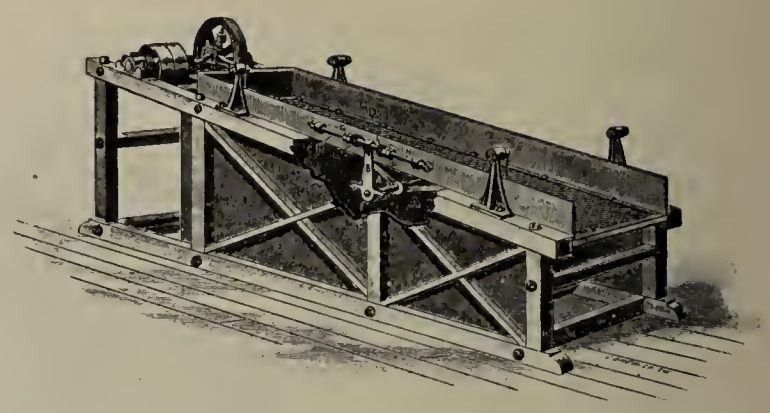
All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

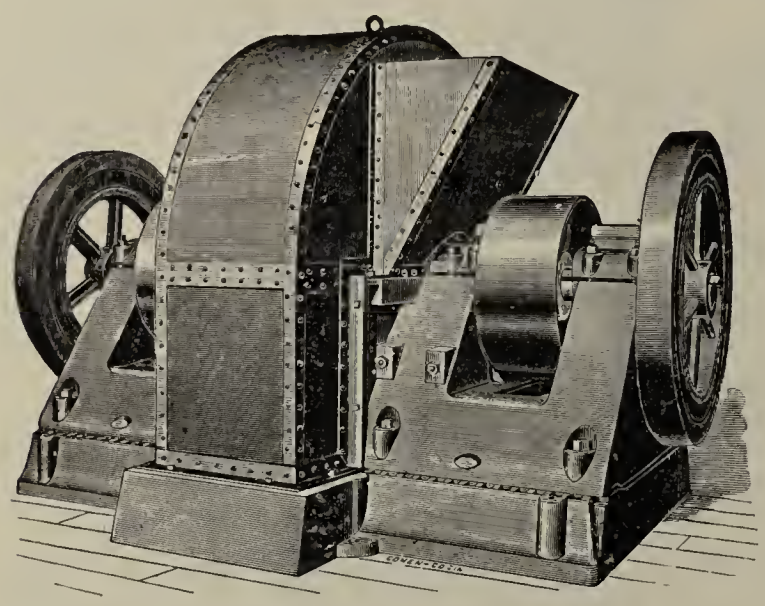
FROST ENGINE CO., Galesburg, Ill., U. S. A.

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.



A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

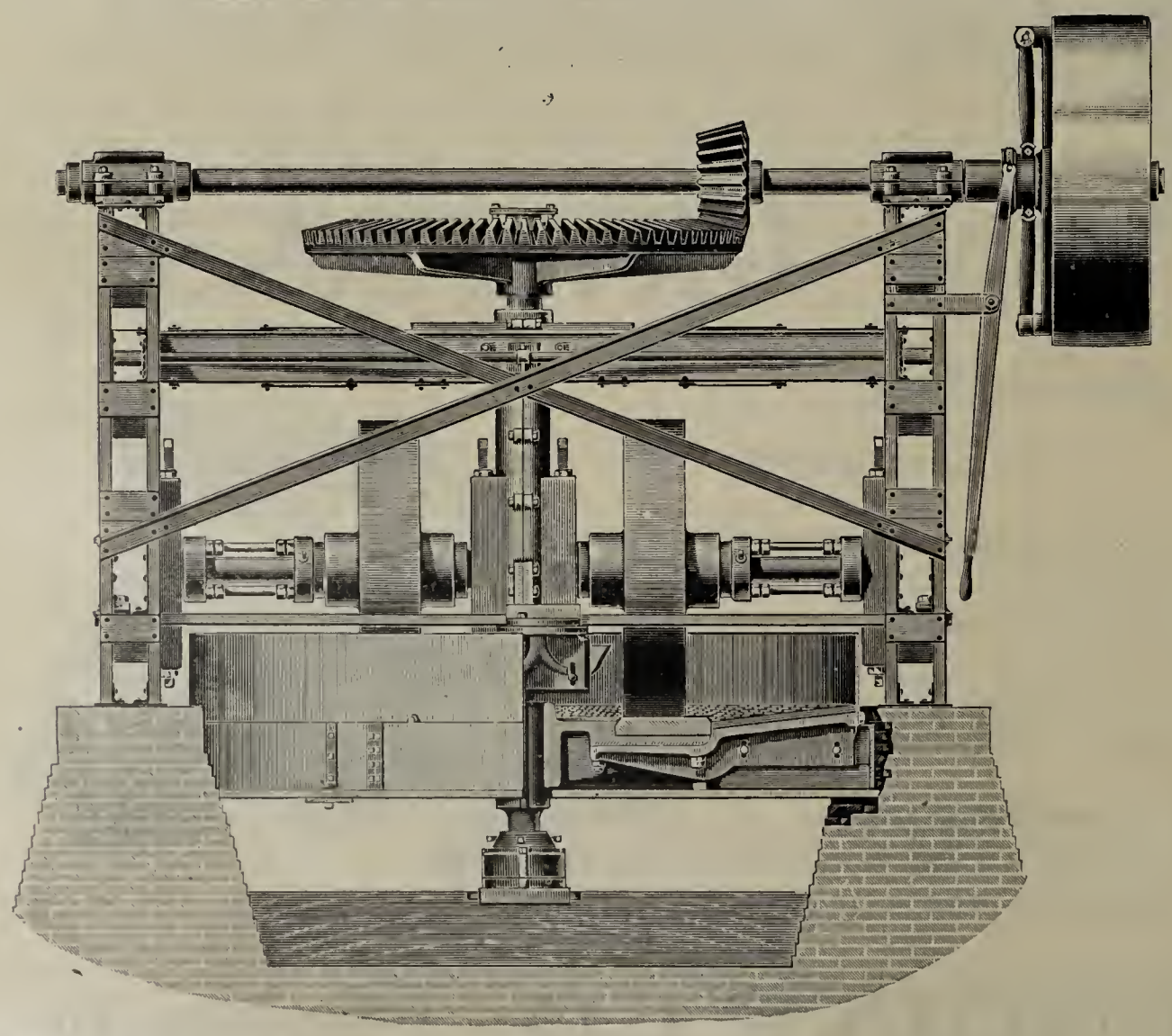
For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials.

Stedman Foundry & Machine Works,

AURORA, INDIANA.



MODERN DRY AND WET PANS,

Lightest Running
Greatest Strength
Most Convenient for Repair.

18

MACHINES OF THIS TYPE SOLD IN 3 MONTHS.

Complete or Part Outfit for

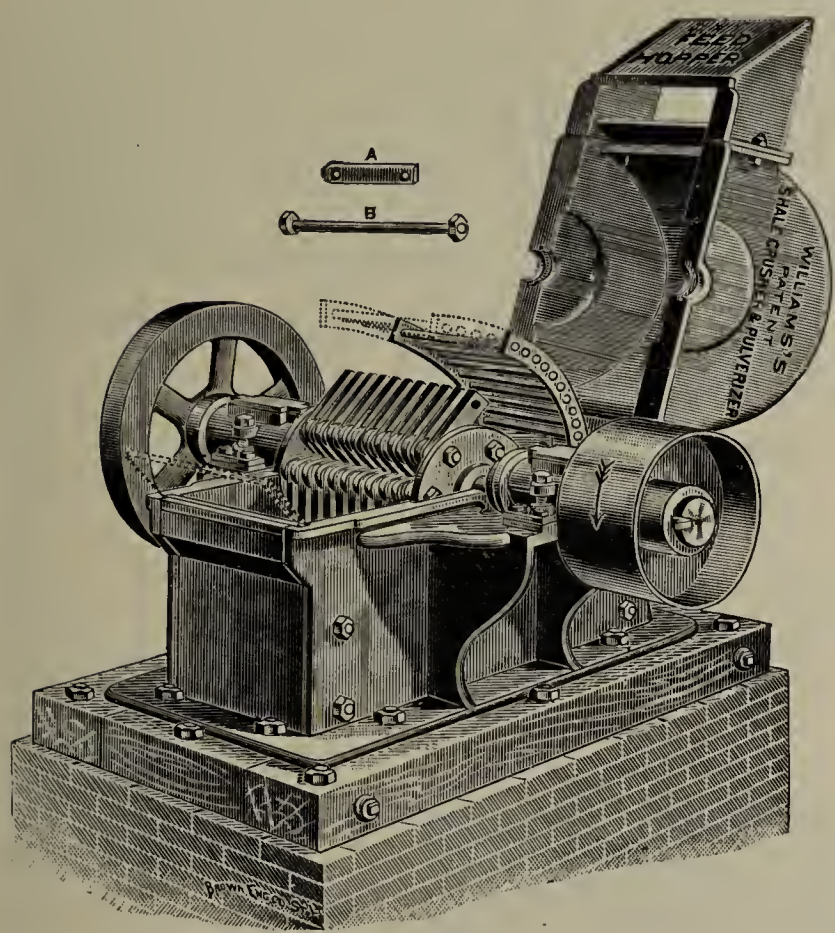
Sewer Pipe, Fire Proofing and Pottery Machinery.

Write us for Catalog and Prices.

TAPLIN, RICE & CO., Akron, Ohio, U. S. A.

The Williams Patent Crusher & Pulverizer Co.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

FOR FURTHER INFORMATION WRITE TO

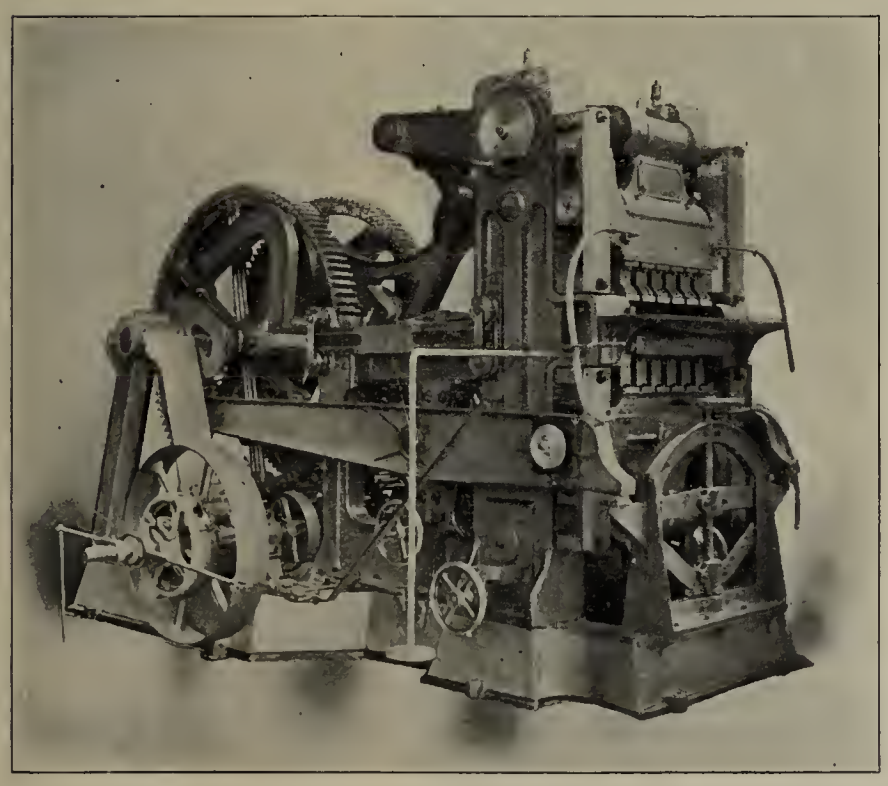
The Williams Patent Crusher and Pulverizer Company,

2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Singer Building.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, SIMPLICITY and SERVICE.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market.

All parts subject to strain are made of the best Bessemer steel.

Fitted with the Fernholtz Mold Box. Undoubtedly the leader.

We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer,** in our own factory.

Dealers in Brickyard Supplies.

PARIS, TEXAS, March 13, 1900.
THE FERNHOLTZ BRICK MACHINERY CO., St. Louis, Mo.
Gentlemen:—We are in receipt of your inquiry in regard to our Brick Machine, and in reply beg to say that we have been operating machine regularly for five years, and the repairs on same have been about $50.
We consider this a very good record and will take pleasure in recommending it to anyone who is interested in Brick Machinery.
Very truly yours, CARTER & ROLLINS.
Per Carter.

Further Information on Application.

The Fernholtz Brick Machinery Co.,

CABLE ADDRESS "FERNBRICK."
WESTERN UNION CODE.

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

Mexico Agent: INTERNATIONAL SUPPLY COMPANY, City of Mexico, Mexico.

The STANDARD BRICK DRIER,

Dries any and all kinds of clay products, and does it thoroughly and economically. It is always sold under an iron-clad guarantee to do a given amount of work in a specified time. **It does not disappoint.** You take absolutely no risk in buying "The Standard" Drier under our guarantee as we as-ume the responsibility of turning over to you a complete drying plant, capable of doing whatever we say it will do.

We Plan, Build and Equip Complete Drying Plants of any Capacity Desired.

We shall be pleased to answer all questions concerning the drying of any kind of clay products, and explain fully how and why "The Standard" is the **most profitable** Drier that any clay manufacturer can use.

Write for Catalogue No. 50 and Testimonials.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., MAY, 1900. No. 5

Written for THE CLAY-WORKER.

TERRA COTTA IN BRICK CONSTRUCTION.

—Artistic Adornments.—

EVERY EFFORT should be made to sustain the theories of architects that terra cotta is the most beautifying material to be used in correlationship with brick.

Color, expression, classical and modern designs lend themselves so readily in the harmonies of color and general line of feeling, as to constitute it par excellent the one covered material, able by its hard resistance to the chemical and atmospheric pressure to withstand the decaying process of time and even fire.

This alone is gratifying, but it becomes commensurately more so when we realize that it is a clay formation, beautified and made expressive by clayworkers.

Every architect today realizes that terra cotta is an all important factor, aiding him to exert an artistic influence upon the general community and setting an example that may be emulated by his juniors in the furtherance of a good cause.

From the period of 1892 immense strides have been made, and the good cause had developed from the stock or mere mechanical designs into an interpolation and sculptural effect.

The degrees of comparison could not be more nicely adjusted than in an inspection of the "Bingham House" hotel, southeast corner Eleventh and Walnut streets, and the "Rittenhouse" at Twenty-third and Chestnut streets, both reconstructed and remodeled by Architect Willis G. Hale. The former may be termed an achieved engineering success, in which the material brick and terra cotta were made the chief mediums. The introduction of the terra cotta details in the illustration will serve to show to what extent it was used and the mediocrity of the designs when compared with the present day ornamentation and purely artistic detail to be seen in the life-size figures adorning the Rittenhouse.

No higher or better expression has been given to terra cotta than that which is now seen on the facade of this building. The female or angel figure is made to serve as the corbel to the five or six balconies extending in graceful and flowing lines along entire front, judiciously harmonizing with the deep Pompeiian or mottled brick. Keyed up with a strong desire to give to the public something more sculptural than the ordinary, in this he not only succeeded in his detail drawings, but personally gave part of his time in the modeling rooms of the Perth Amboy Terra Cotta Company to watch the process of building up and directing personally the modeling artist in his efforts to obtain figures having for their chief tributes the senses human in form.

Life Size Figure above the Main Entrance of the Medico Chirurgical Hospital. Executed by the Conkling-Armstrong Terra Cotta Co., Philadelphia.

anatomy and expression. The spandrels and pediment figures and the winged figures throughout may be accepted as the best yet introduced in terra cotta within the walls of the city. The expenditure of $7,000 for this material alone will be signal evidence in itself of the growing popularity of this soft, coy and winsome, but once despised, material, standing now as the garniture of the sturdy, plain but ever loyal brick. Mark well the pediment figures of the two boys and the armed knights, the essentials have not been betrayed into vulgarity, but are identical with the reqirements of art.

The two illustrations of the boy and the maiden are to be placed over the top of the entrauce reaching up to the third story of the Medico Chirurgical Hospital, now in course of erection at Seventeenth and Cherry streets. This building was designed by Hermann Miller, architect, is 150 by 100 feet, six stories high. Another harmonious treatment in brick and terra cotta, embodying good Greek details, with figures, as seen in the accompanying pages. These figures, together with the ornamental details, are supplied by the Conkling-Armstrong Terra Cotta Co.

The treatment of these figures shows an immense stride over the old stock figure which formerly dominated the market. The same law governs the modeling of these as formerly governed the treatment of public monuments. The figures are given to a well-known modeler. Sometimes, where clean cut and finely expressed work is required, the sculptor's services are called in, and he works upon it with the same judicious earnestness as would be applied to the figure that later would be cast in bronze.

Thus it will be seen that terra cotta and brick are entering into a state of revival that must eventually mean, in the greater part, the displacement of stone, both as a material and an ornamentation.

The age and fire-defying properties are commending themselves to the marking of a nation's history by the architecture of its cities. W. P. LOCKINGTON.

Written for The Clay-Worker.

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 7.

BY ALFRED CROSSLEY.

—How to Make Good Fire Brick.—

THE FIRST AND PRINCIPAL requirement in a fire brick is that it should be refractory; in fact, whatever other good qualities it may possess, it is not a fire brick without this. This quality depends, first, on the chemical composition of the clay from which it is made, and, secondly, on its mechanical condition. The first of these we have already discussed at length. The mechanical condition of the brick relates to the fineness of its particles, the proximateness of the grain and the hardness to which it has been burned. Some people will say, "Anybody can make a good brick if they have good clay," and yet this does not by any means follow. To illustrate: We can take the very best clay that nature has stored in the earth, and by improper manufacture produce an inferior brick to one made out of a poorer clay, but treated to make the best out of it. This still does not say that a brick of the highest class can be made out of inferior clay. Take a sample of the very best nonplastic clay, crush it and reduce it to an impalpable powder, then temper in a solid bottom pan to a tough and putty-like mass, mold and press as hard as possible into a dense, solid brick. Then burn it in a very strong heat till it is extremely hard, and we have as a result a brick that is of very restricted use for metallurgical purposes, if any. Again, take a plastic fire clay whose analysis, perhaps, shows it to contain more than the average of impurities. Crush it to a proper grain; sift it, mix it up with water, being careful not to favor its plastic nature more than necessary; mold it into a brick and press just hard enough to bring the particles into proper cohesion; or, still better, after crushing and sifting, merely damp the clay and make on a dry press, and, after burning, we have a brick that will stand fairly well, and a great deal better than the first named. Of course, these are extreme comparisons, but I make them to show how the conditions may be reversed by opposite methods.

Any method of manufacture which tends to break down the grain of the clay, and reduce it to a tough, adhesive condition, is wrong in principle. As explained in the introductory portion of these articles, when comparing fire brick with paving brick, a fire brick should be open, porous and of somewhat coarse grain. Up to a certain point, the coarser the grain the better, but, if too open, the brick becomes weak, and allows the fire to eat in between the grains and disintegrate the brick. As near as can be stated, large sized grains of wheat cut in two give about the proper size and shape of grain of the body of a fire brick.

—Good and Bad Selection of Fire Brick.—

With regard to this granular condition of a fire brick, as conducing largely to its refractoriness, a fitting natural illustration is found in the case of granite. Granite consists, as is well known, of an agglomeration of quartz, feldspar and mica, generally in parts of considerable size, comparatively speaking. Now, when a piece of granite is exposed to a high temperature in a furnace, even for a considerable time, it will not melt, but if it be previously reduced to powder and then similarly treated it will melt with facility. Of course, it is to be understood that particular regard is to be had in the purposes for which the fire brick are to be used. A highly refractory brick, such as I have described, is required for puddling and heating furnaces, the hearth and bosh of blast furnaces, etc. But for situations where a certain amount of strength and toughness is required, a brick that is too granular would not be suitable; for instance, in the inner wall of a furnace and the lining of cupolas, where, in addition to being subject to heat, the brick have to stand the abrading action of hard materials in friction with them. In this case a larger proportion of plastic clay should be used, which should, however, be as pure as possible, and the brick made somewhat tougher and denser. It is one of the particular points in fire-brick manufacture to obtain a brick that shall be at once highly refractory and able to stand wear and tear, for, as a general thing, the refractoriness diminishes as the mechanical strength increases. One of the matters requiring great care in fire-brick work is to use the right quality of brick for the service required, and one of the chief causes of the failure of fire-brick work is a neglect of this precaution. I knew of a case where some fire brick of undoubted quality, from one of the best makers in Pennsylvania, were used in a part of the furnace where they were not adapted. The result was that the brick wore out in a short time and the work had to be done over again. The brick cost a high price where they were used, and a much cheaper brick would have given a great deal better service. This is only one instance out of many where a lack of judgment brings a good brick into disrepute.

For steel works the most refractory brick only can be used, owing to the intense heat and the sudden changes to which they are subjected. For the roofs, ports and some other parts of the Siemens open-hearth steel furnaces, silica or Dinas brick are chiefly used, no other brick having been found to equal them in durability. The same applies also to the crowns of glass-melting furnaces. For coke ovens, a brick which meets with great favor in the north of England is the one locally known as a "half-ganister" brick—that is, a brick made of about equal parts of fire clay and silica stone. In West Virginia and other places, a few years ago, it was the custom to use a very inferior brick, under the mistaken notion that anything was good enough for a coke oven. This seems a kind of "penny-wise and pound-foolish" policy, when it is

remembered that the cost of the brick is only a small part of the cost of a coke oven, and that it costs just as much to pay freight on and build with poor brick as good ones, and with this marked difference: that the life of an oven built with the latter is three or four times as great. The brick in coke ovens have not, as a rule, to be subject to a very intense heat, but they must be capable of resisting sudden, extreme changes of temperature, and the action of steam generated in the common practice of turning a stream of water into the oven, when at its greatest heat, to cool the coke. Hence a brick which vitrifies at the heat of a coke oven is unsuitable, as it will not stand the sudden contraction, and drops off in places and soon lets in the crown and then has to be rebuilt.

For boiler settings and other inferior purposes a brick of medium refractory quality and of good mechanical strength is required. Fire brick must be set in fire clay and never in lime mortar. Any bricklayer who is used to fire-brick work knows that, but I doubt if one out of five hundred knows why. The reason is that at furnace temperatures the free silica in the brick would be liable to combine with the lime of the mortar and produce a readily fusible silicate of lime, and the destruction of the furnace lining would be induced. Here is a case in point where the value of some knowledge of chemistry is shown. Coming now to the actual manufacture of fire brick, we find it to embrace the following processes, viz.: The weathering of clay, calcining when required, grinding and mixing and tempering, molding and pressing, and drying, setting and burning.

—The Advantages of Weathering Fire Clay.—

Weathering the clay tends to improve its quality in two or three ways. It greatly assists the assorting of the clay and the elimination of injurious substances. When the clay is freshly mined oftentimes pieces will come out of a doubtful character, and many times a piece that would be allowed to pass while fresh, after being weathered some time, can be readily distinguished and thrown aside. Then, again, it not infrequently happens that small or large kidneys of ore will come out of some part of the vein that, after weathering, can be picked out with more certainty. So, also, of clays containing iron pyrites, some of which may escape the eye of the sorter while fresh. The clay should have a preliminary sorting before being weathered, and, for the best grades of brick, be culled over again afterwards. Considerable importance should be attached to this where a high standard of excellence is aimed at. The weathering of fire clay, especially the nonplastic kind, greatly assists the grinding and tempering, as it becomes thus naturally disintegrated and is very much easier to grind. Hence the capacity of the grinding pans is increased and the wear and tear also very much reduced. There is no doubt, also, that the quality of the clay is improved by weathering. I have myself seen instances where clay that, when freshly mined, would be rejected, after exposure for a lengthened period has become evidently purified. Dr. Peter, of Lexington, Ky., has given a description of this which is very interesting. He says: "In using clay for refractory pottery, fire brick or tiles, etc., much depends on the preparation of the clay. It is laid up in heaps or ridges, exposed to the weather for months. The water and oxygen of the atmosphere and the influence of frost disintegrates it and measurably washes and purifies it. By the combined influence of moisture, oxygen and any organic matter which may be present, insoluble iron sulphides are converted into soluble sulphates and insoluble iron peroxide changed to soluble iron bicarbonate. Some of the lime and magnesia are also washed out by the rains as soluble bicarbonate, and some of the residual potash and soda which entered into the chemical constitution of the rocks from which the clays were originally derived, by the process of prolonged weathering, will become separated by the same process and washed out by water, and thus the clay becomes greatly improved in purity and in its refractory character. The washing part of the process is aided artificially, and thus also are the pebbles, fine or coarse sand (free silica), separated more or less, as may be necessary, from the finer particles of the impalpable silicate of alumina. In the purification of some clays the powdered and softened mass is mixed with impure water containing organic matters and allowed to ferment or rot in a warm atmosphere. The decomposing organic matters aid greatly in the separation of the mineral impurities by bringing them into a soluble form,

Pediment Decoration of the Rittenhouse Building, Philadelphia. Executed by the Perth Amboy Terra Cotta Co.

as detailed above, and thus facilitate their removal from the clay by the subsequent washing with purer water."

The expense and interest on capital involved in carrying over a large stock of clay, no doubt, in a large number of cases, is a reason for the clay being used unweathered, and the clay is ground and made into brick, in some cases, within a few hours, and, in others, within a few days from being mined.

The best results need not be expected from such a course. Where it is possible, not less than nine or ten months' supply of clay should be carried ahead. The clay should be spread over as much ground as possible, as where it is put into large heaps the inside of the heaps do not get the weathering action to a proper extent. It should be so arranged as to use the clay as far as possible in regular sequence, so as to give all the clay the benefit of the full period of the exposure.

(To be continued.)

Written for The Clay-Worker.

BRICK PAVEMENTS IN GREATER NEW YORK.

By G. W. Tillson, C. E.

BROOKLYN HAS AT THE PRESENT time, in round numbers, two hundred and thirty-five miles of cobblestone pavements. These are, to a great extent, in bad repair, and the few that are kept in good condition are done so at great expense, so that when brick were being used for improved pavements it was thought of consequence to try the experiment of taking up some of the worst cobblestone pavements and relaying them with vitrified brick of such character as would not be fit for an improved pavement. In this way the good cobblestone on the street were used to repair others and the mileage of cobblestone reduced according to the amount of brick laid. The bricks were seconds. It was not the intention, however, to lay brick that were soft, but those that were of bad shape and form so that they would not make a first-class pavement. The bricks were laid on sand and nearly a mile of this kind of pavement was put down in 1897. In speaking of this in his report to the Deputy Commissioner in January, 1899, Mr. N. P. Lewis, Engineer of Highways in Brooklyn, said:

—Brick Replacing Stone Pavements.—

"In 1897 the experiment was tried of laying vitrified brick pavement on a sand foundation in place of cobblestone, on streets having light traffic, and where they were in imperative need of repair. The results obtained have been satisfactory and a continuation of this policy is recommended. The bricks used for this purpose, while tough and hard burned, were second quality of brick which had been thrown out on account of shape, color, etc., and were purchased for two-thirds, or less, of the price of first-class brick. The advisability of making a contract for the burning of one and one-half or two million such brick for use during the coming year is suggested."

As a result of this recommendation, bids were asked in the latter part of 1899 for 900,000 of second class vitrified brick to be used for this purpose, and a contract was made with the Eastern Paving Brick Co., of Catskill, N. Y. (they being the lowest bidders), and the bricks were furnished, but so late in the season that none of them were laid last year. They will, however, be of use the coming summer.

It often happens that property owners wish a street graded, curbed and guttered before any pavement is laid. It is the present policy of the Department of Highways in all such cases to have the gutters made of vitrified brick, and bids are now being called for one street under such conditions.

Avenue D, from Coney Island avenue to the Eastern Parkway, is to be paved with macadam. The plans here also call for gutters of vitrified brick, the specifications requiring the best of brick to be laid, according to the usual custom, on a sand base. The pavement not being permanent, it was not considered necessary to have a concrete foundation.

Tennis Court, Flatbush, is a private street running from Ocean avenue to East Nineteenth street. It is built up with very handsome residences. Last year the property owners improved their street by laying a macadam pavement at their own expense, and used vitrified brick for the gutters. The accompanying cut shows the character of the street and also the appearance of the brick gutters.

—Brick Guttered Macadam Roads.—

Probably one of the best examples of brick gutter in this country is that seen on the Shore Road. This is a drive that

Shore Road, Brooklyn—Brick Gutter.

has been recently laid out and constructed by a special commission appointed by the Governor. It extends from Fort Hamilton past the Narrows, along the east shore of New York bay. It has been curbed and partially paved with macadam. This drive will, when complete, be one of the finest in this country, if not in the world, for on any pleasant Saturday afternoon in the summer a person driving or wheeling along it will see almost every craft afloat, from the single scull racing shell to the mammoth ocean liner. The gutters on this road are also made of vitrified brick. The commissioners wishing

Pennsylvania Ave., Brooklyn. Laid in 1896.

this job as nearly perfect as possible had the curbing machine dressed to a perfect surface, and the gutters laid in cement upon a concrete base so that they are practically solid masonry. The result certainly justifies the care and expense put upon this part of the work, and when this work was continued in 1899, the same plan was followed out. The engineer of the commission, Mr. E. C. Sweezy, is entitled to a great deal of credit for his painstaking in getting a complete piece of work.

The Park Commissioners have also used vitrified brick to a considerable extent for the gutters of Prospect Park and in other drives and parks where a macadam roadway was used and it was necessary to make a hard and durable gutter.

The intersection of Bedford avenue and Eastern Parkway was also paved by the Park Commissioners with vitrified brick

Tennis Court, Brooklyn, Showing Brick Gutter.

in 1895. This was the first piece of vitrified brick pavement laid in Brooklyn, and probably in Greater New York. It has been subjected to an almost continuous, although not heavy, traffic since that time, and is to-day in practically as good condition as it was when first laid. There are several other places in Brooklyn where the street car companies have many tracks laid in the streets at transfer points, where they have, at their own expense, paved the space between the tracks and rail, as well as the remainder of the street, with brick. Where street car tracks cross parkways and boulevards it has also been the

Highland Boulevard, Brooklyn. Laid in 1897.

policy of the Park Commissioners to pave this portion with brick.

These different cases are given in order to show how brick can be used in a great many places in small quantities, perhaps singly, but when they come to be taken as a whole, the quantity is appreciably large.

—Brick Guttered Asphalt Pavements.—

Public officials generally in the East are recognizing that when a good, smooth and durable pavement is wanted to fill some special conditions, that brick is the material that will give the best results. The city of Washington has, perhaps, gone farther than any other in this direction, as there they have adopted the policy of laying brick gutters in every instance where streets are paved with asphalt, and in a great many cases where it is necessary to lay blocks adjacent to the rail of street-car streets have used brick for that purpose.

In 1895 the Park Commissioner of Brooklyn took up the improvement of a certain number of streets that had been placed under the charge of the Park Department for the purpose of establishing driveways and boulevards. Pennsylvania avenue, of East New York, was a notable instance. The roadway is fifty feet wide and vitrified brick were used for the pavement. The bricks were laid substantially, on a concrete base, the joints being filled with Portland cement grouting, mixed in equal parts of sand and cement. This street has been in constant use since that time and the accompanying illustration gives a fair idea of its condition at the present time. The photograph, however, was taken on a holiday when the pavement was somewhat damp and was not as clean as usual, so that it readily does not do the pavement justice. With the exception of one or two small places, the pavement is in practically the same condition as when laid.

This boulevard was continued northwesterly to meet the pavement of Bushwick avenue, and vitrified brick was also used there. Since that time the city authorities have laid strips of asphalt adjoining the curb on the stone pavements of Bushwick avenue in order to give bicyclists a smooth road from the eastern portion of Brooklyn to this boulevard and thence to Glenmore avenue and the good roads of Long Island. In certain portions of Pennsylvania avenue, sewers had been constructed but a short time previous to the laying of the pavement. The contractors not knowing this, took no special precaution over the old trench, and before the concrete was entirely set, the earth in the trench settled, taking the concrete with it so that the brick seemed to fail also, when the result was brought about wholly by imperfect construction.

—Why Brick Pavements are Best.—

Highland Boulevard, of Brooklyn, is another extension of the parkway system running in a southeasterly direction from Bushwick avenue along the hill by Ridgewood Reservoir, making a beautiful drive on a clear day, giving a fine view of Jamaica Bay, Coney Island and the Navesink Highlands of New Jersey in the distance. The Park Commission continued their policy here and used vitrified brick for this pavement. Although having been laid three or four years it is now as good as ever, as can be seen from the accompanying illustration. This street possibly more than any other illustrates one of the great advantages of brick as a paving material. Other smooth paving materials, wood and asphalt, have a certain life of their own that is entirely independent of any traffic to which they may be subjected, that is, the action of the elements causes the material to decay and the life of the pavement is dependent entirely upon the life of the material, even if it have no traffic at all, but with brick this is not so. While the surface of the brick is smooth and pleasing, its life is determined entirely by the traffic, and on certain streets where traffic is light, it will last almost indefinitely, as the action of the weather has no effect upon it whatever. This Highland Boulevard has a very light traffic, and will require repaving only at the end of a long period of years.

An engineer who has been interested in pavements during the past few years cannot but wonder as to the effect of the development of the automobile upon the pavements of the future. No one can expect to see the horse driven from our streets during the next few years.

But when one considers that an electric carriage recently ran fifty miles over Long Island roads in two hours and three minutes, when he hears that seventy-five automobiles are soon

to make the round trip from London and Edinburgh, when he notices the increase in the electric cab service in all our great cities, he cannot but be impressed with the fact that the coming pavement must be designed and constructed according to the wants and needs of self-propelled vehicles.

If he go back to the genesis of pavements and trace their history down to the present time, he will find that all modifications have been made to satisfy the demands of traffic or the wants of the people. When the traffic became heavier, cobblestones gave place to the smoother Belgian block, and they to the improved granite on concrete with tar and gravel joints.

When the population of our cities became congested a sanitary pavement was demanded, and asphalt, brick and smooth impervious pavements became a necessity.

—The Automobile will Increase the Demand for Brick Pavement.—

The engineer who has carefully analyzed and studied the requirements and properties of an ideal pavement which shall satisfy all the demands made upon it will find that the introduction of the self-propelled vehicle as a factor in the calculation will require consideration of an entirely new property, that is, one that will furnish a surface that gives the tire a strong hold upon the pavement without increasing the draft.

With a vehicle drawn by an external power, this was of no consequence. If the pavement presented but light resistance to traffic, the less friction between the wheels and the surface the better. But as the power of a locomotive depends upon the friction of the drivers, so an automobile depends upon the friction of its wheels for its ability to move.

To satisfy this want then, a pavement must be smooth and not slippery. At present all automobiles are constructed with rubber tires. With no horses the wear on the pavement is reduced to a minimum and is almost nil. So that a material that has inherent durability, makes a smooth pavement when laid, and does not wear slippery, will satisfy the want.

Granite can only be made smooth at a considerable expense. Asphalt has a certain life independent of traffic and is often slippery, while vitrified brick seems to fill the necessary requirements almost exactly. So that it does not seem a wild prophecy to predict that vitrified brick will be the best paving material for an automobile traffic. Is it not rather a logical conclusion? And can any one, after carefully studying the conditions, arrive at any other?

Of course, it is true that location, availability and expense will often make other materials the best under certain conditions, but in the central West, where the best clays in the world for making vitrified brick are found, they are bound to be the prevailing material.

It must be understood in this connection, however, that what is understood by a brick pavement is one made of the best brick in a first-class manner. Engineers understand that it is necessary to use vitrified brick in order to make a good pavement. Unfortunately, all city officials do not know this, and the result is that brick pavements have received setbacks in many localities on account of poor brick being laid in an improper manner.

When we think of the character of the brick and the methods of laying used in the early brick pavements, the wonder is not that so many failed, but that enough were successful to sustain the faith of the early pioneers in brick paving so that they persevered until their efforts were crowned with success.

What is wanted now is a standard method of testing, so that results obtained in one laboratory can be directly compared with those obtained in another, and in this way the relative values of two different bricks can be determined. Tests have been made for years, but in a very crude and imperfect manner, each operator establishing his own standard, so that results could not be intelligently compared.

The National Brick Manufacturers' Association fully appreciated this, and have been doing yeoman service in this connection. Yet, despite the intelligence, care and thoroughness with which their work has been carried on, they have been obliged already to modify their conclusions as to the best method of conducting the rattling test, and they are still investigating the subject.

Engineers, as a rule, have neither the time nor opportunity to make such exhaustive tests. They have the disposition, but very seldom the necessary funds to conduct a scientific and thorough investigation. Neither would the results of a single office have the weight of the conclusions reached by such a representative as the National Brick Manufacturers' Association.

It may be encouraging to this association to know that engineers in the East, where paving brick are manufactured to a limited extent only, are carefully watching its operations, and are accepting their conclusions, knowing the intelligence with which the subject is treated.

(To be Continued.)

Written for The Clay-Worker.

A NEW PAVING BRICK TESTING MACHINE.

DURING THE PAST FIVE YEARS tests on paving brick have passed through many stages of development. Crushing and cross-breaking were first advocated, and afterwards discarded; the absorption test has been similarly disposed of. The rattler test, after many modifications, has been accepted as the most reliable guide to the quality of different grades of paving brick. Such at least are the stages in the evolution as shown by the action of the National Brick Manufacturers' Association. At the 1897 meeting of this Association a standard rattler test was adopted, to consist in rattling or tumbling an unmixed charge of brick for eighteen hundred revolutions, in a foundry rattler, having a chamber twenty inches in length and twenty-eight inches in diameter, the volume of the charge to amount to fifteen per cent. of the volume of the chamber.

It was shown soon afterwards that this test did not give as satisfactory results as a similar test in which a part of the charge of brick was replaced by cast-iron shot. Still another test was devised, called the Jones test, named for its inventor, having pockets in the staves of the rattler, in which the brick were fastened, with the edges projecting inside, and abraded by means of cast-iron cubes rolled over their surface by the rotation of the rattler. Both of these tests were investigated by the N. B. M. A., with the result that the shot test was tentatively adopted at the 1900 meeting, it being understood, however, that the two tests were to be still further investigated.

At the present time, then, the shot test, conducted with the specifications given above, except that the charge shall consist of nine block or twelve brick, and 225 pounds of one-pound and seventy-two pounds of eight-pound cast-iron brick, is accepted as the standard test for paving brick. The brick are required to be dry, as wet brick lose less by this test. And it is suggested that the staves of the rattler be of steel. This test, however, is not conceded to be all that could be desired, and the test with the brick secured in pockets has not been finally rejected, but is being modified and tested to determine whether or not it can be made practicable.

The advantages of these two tests may be stated as follows: The shot test may usually be performed with the ordinary foundry rattler with some modifications, and may thus avoid the purchase of expensive apparatus; it is not seriously affected by variations in the size of the brick or in the volume of the charge; as far as investigated, it discriminates properly between good brick and bad. The Jones test more nearly reproduces the actual conditions of the street; the test probably gives more consistent results, although it is not apparently more discriminating than the shot test; it permits the easy identification and weighing of the individual brick; and this

test is not seriously affected by the condition of the brick, whether wet or dry.

The objections to the shot test are that the heavy load of cast iron pounds the ordinary rattler to pieces, necessitating steel staves; it is difficult to identify and weigh the individ-

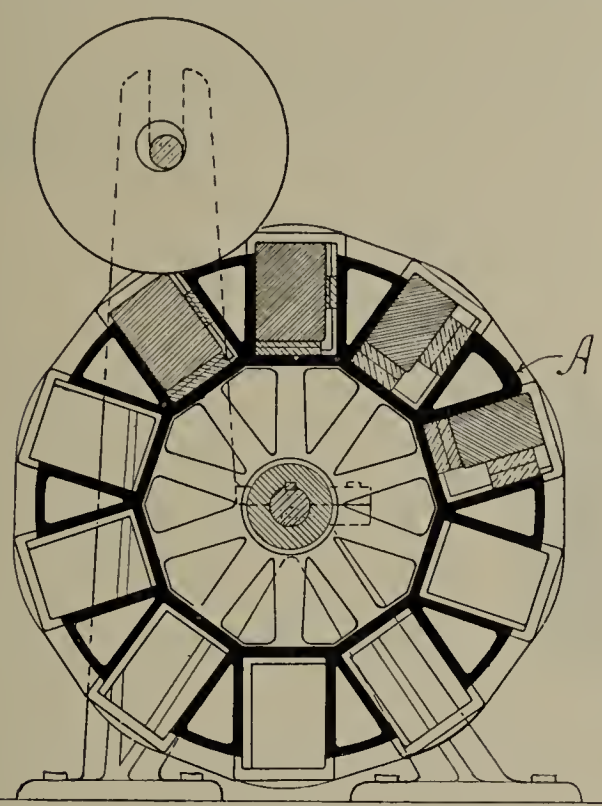


Fig 1

uals of the charge, the result consequently being an average that does not give a measure of the uniformity of the brick; the test is affected by the dampness of the brick, necessitating drying in an oven before testing; it is subject to accidental variations due to the brick taking and maintaining unfortunate positions in the rattler; the test consequently shows lack of uniformity of results, and is not, perhaps, as reliable as is to be desired.

The objections to the Jones test are: Tediousness in operating, much time being required to secure the brick in the pockets and to remove them. No satisfactory method of holding the brick has been devised; the set screws usually used are laborious in operation and easily loosen, permitting the brick to fall out of the pocket, thus defeating the test; special apparatus is required which is not available for any other purpose; large block give lower losses than small brick, thus making comparison between brick of different sizes a more difficult matter.

Neither of the two tests can be said to reproduce the exact conditions that obtain in the street. Both tests produce abrasion as well as impact upon the brick. But in the street abrasion cannot properly be said to play any part; wheels do not rub the brick; they roll over them, producing impact not so severe as that of the shoe, but more frequently repeated. From an examination of many good brick pavements the writer has formed the opinion that the action of the wheel is more severe than the blows of the shoe, and that, while the latter may apparently cause more pronounced chipping, the striking of the wheels against the edges of the brick may produce a similar result, and that even hard brick pavements will wear out first in the wheel track of concentrated traffic.

Brick pavements fail in spots, each defect probably being due to the presence of a single hard brick or to groups of soft brick. Uniformity and toughness are the most essential qualities of a paving brick.

Keeping these points in mind, the writer has designed and here proposes a new machine for testing paving brick, as illustrated in the accompanying figure. A revolving drum has pockets on the outside, in which the brick are secured by means of hardwood wedges. The pockets are open at the ends; and on the face for a length of six and one-half inches. The brick are slipped into the pockets from the end, and are held against the outer face of the pocket by double wedges against the face of the drum, thus exposing six and one-half inches of the edge of each brick; and they are held against the side of the pocket by wedges at the side. The brick are thus held by pressure from the sides; and by pressure on the edges for one and one-half inches from each end. The outer edge of the brick is at a constant distance of twelve inches from the shaft, no matter what the size of the brick. Two blows of a hammer on the wedges will secure one brick in place, and it is released with equal ease.

The wearing effect is produced by six cast-iron discs, each one inch thick and twelve inches in diameter, which are supported loosely side by side upon a shaft so as to roll over the brick as the drum is rotated. The pockets are ten in number, and any number of brick up to ten may be tested, without requiring the full charge; different varieties in limited number may be tested at the same time.

This machine has not yet been shown to be practicable by actual operation. But numerous conditions were taken into account in the designing, which will be detailed here to show that the machine is at least promising. A test conducted in the above machine would more nearly reproduce the actual conditions of the pavement than any thus far proposed. The effect of violent impact may be secured by allowing the edges of the brick to project one-half or three-quarters of an inch beyond the surface of the drum upon which the rollers rest. The corner of the brick is thus given a blow by the discs, reproducing to some extent the chipping effect of the shoe. The shaft bearing the discs is not placed directly over the drum, but upon the side towards which the brick rise. The corner of the brick

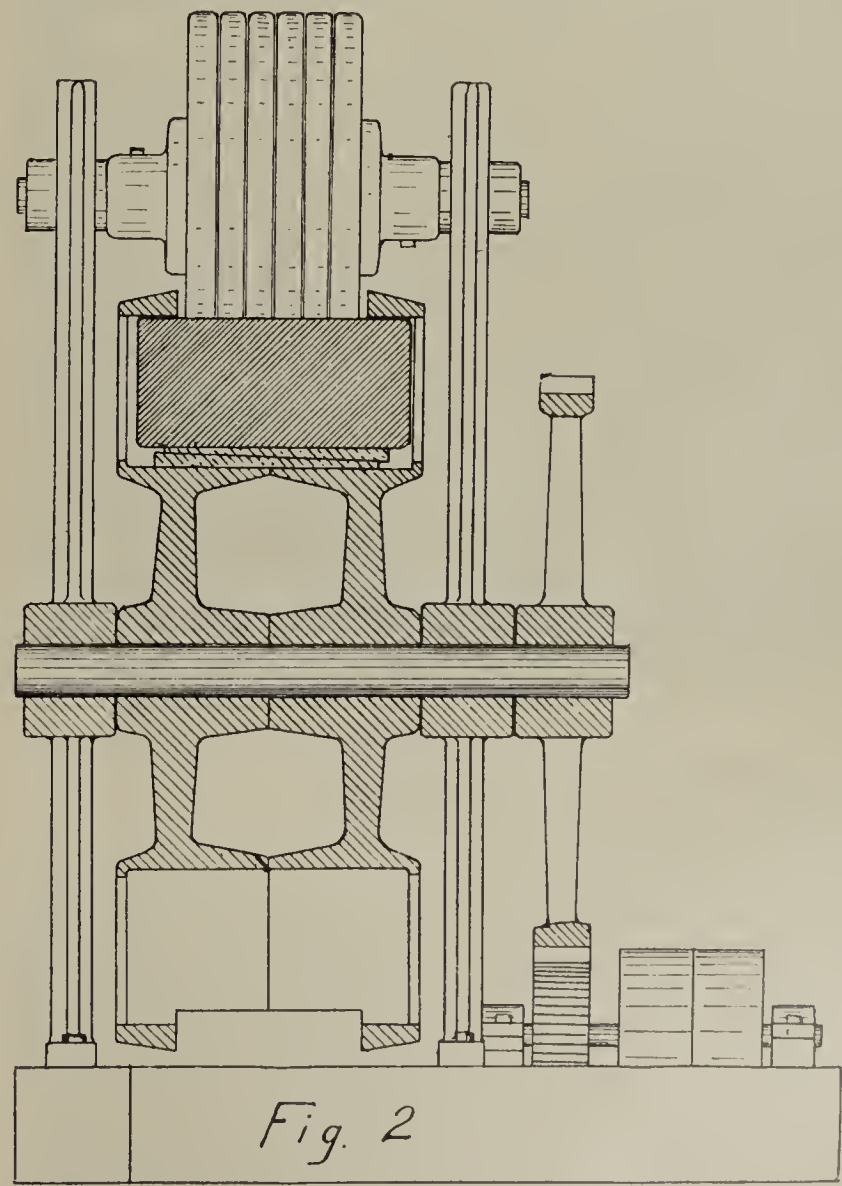


Fig. 2

lifts the discs vertically, so that it bears their direct weight, together with the blow resulting from the velocity of the drum. The brick then passes under the rollers, receiving upon the face an inclined pressure, which is greater than the actual weight of the roller. The face of the brick is thus subjected to a slightly greater pressure than the corner, which should

serve to distribute the wear. The weight of the six cast-iron discs would be about two hundred pounds. In the Jones test this weight of cast iron, rolling over the brick with less concentration, produces a measurable wear on good brick without an excessive number of revolutions. In the test here proposed the two hundred pounds of discs, concentrated upon their points of contact, should produce greater wear of the brick than in the Jones test. There ought consequently to be no difficulty about securing sufficient loss for comparative purposes in a short space of time. The number of revolutions and the rate of speed would have to be determined by actual trial of the machine, and cannot be fixed by theoretical considerations.

After passing over a brick, the rollers drop back upon the drum of the cylinder before striking the next brick. Variations in size, therefore, should have no effect upon the losses, which should be based probably upon the thickness of the brick. It might be desirable to have the drum shaped as at A, Fig. 1, to prevent the jerking motion that might result from the rollers passing off the brick upon the drum as shown.

In case the wedges become loosened, the brick and wedges are prevented from falling out of the pocket by projections at the end, which, however, permit free access to the wedges. Brick broken, but remaining in the pocket, cannot endanger the machine, as the rollers are free to rise at such obstructions. In case of empty pockets, the rollers do not drop to strike the edges of the pocket, but are supported by the shaft.

Lower losses caused by wet brick are generally conceded to be peculiarities of the testing apparatus, and not of street service. Since the above test practically reproduces street conditions, variations due to dampness of the brick would probably not occur, and they could be tested as brought in from the street. The individual brick are easily identified and weighed, making a uniformity test practicable.

The power required to operate the machine would be much less than that required for the rattler loaded with cast iron and brick. For city engineers especially; this would be a decided advantage.

All parts of the machine are easy of access. The drum may be made of two duplicate castings, as shown in Fig. 2, and requires not a single screw, which is a decided advantage in a machine subjected to considerable vibrations. It might be found best to make the rollers with chilled edges; the wear would probably not be more severe than that on the shot used in the other tests, and they could be as easily replaced.

The apparatus should be inclosed in a dust case, and should be equipped with reducing gear and a speed indicator.

It is admitted that this test requires a special apparatus, which, however, is simple and inexpensive. The writer submits the method and the design for criticisms and suggestions before proceeding with the construction of the machine.

DANIEL B. LUTEN,
Instructor in Civil Engineering, Purdue University,
Lafayette, Ind.

A PROPOSITION TO TRY BRICK PAVEMENTS IN HAVANA, CUBA.

Editor THE CLAY-WORKER:

Understanding that you are interested in the matter of vitrified brick pavement, I desire to say that the experience of many cities in the United States has fully demonstrated the insufficiency of laboratory tests of vitrified paving brick, and established as a fact that the only satisfactory test of paving brick is in the use thereof in a pavement.

It is believed that a number of makers of brick in the United States would be willing to furnish brick at Havana, free of cost, if the city authorities would lay them in a pavement. Fifty square yards of pavement is considered the minimum amount from which a fair test may be obtained.

This department will place in the pavements of this city such brick, not less than fifty square yards, as brickmakers may desire to furnish at Havana, free of cost. The brick will be laid upon a four-inch concrete base, with a sand cushion of about one inch in thickness between this base and the brick. The brick joints will be grouted with cement. Longitudinal and transverse joints of asphaltum, to prevent the formation of a raised arch by the expansion of the brick, will be made. Care will be observed in the location of such test portions of pavement, with a view to securing uniform tests for the various makes of brick. The name of the maker of the brick under test will be displayed along the curb.

It will be the policy of this department, when proposals for brick are opened, to receive bids only from makers whose product has undergone the practical test above outlined. Very respectfully,

W. N. McDONALD,
Assistant Engineer, Supt. Department of Streets.

Written for THE CLAY-WORKER.

BUTTON-HOLE TALKS.

I HAD NOTICED HIM STANDING AROUND, waiting, while a lot of men were talking to me. Occasionally he would drift up close and listen to the edges of the talk, as it were; then, when some one crowded in in front of him and cut him off, he would stand awkwardly, first on one foot and then on the other, nervously trying to dispose successfully of his hands. He was evidently just beginning to get out of that extremely awkward age that comes as boyhood approaches manhood, though he still bore a full compliment of the signs of that period—big feet and hands and long legs and arms. There was a frankness in his face and an unexpressed or suppressed eagerness that attracted me, so that I edged the button hole over toward him, as an older brother loosened his grip on it, and the young man promptly caught on.

"Say," said he, "I heard you telling about your sending your boy to get that man Lanigan to work in the factory, and the boy's coming back saying he could not get old man Lanigan, but could and did get his boy, and how broke up you were, and how you protested against calling him old man Lanigan, when he was an old boyhood mate of yours and younger than you. I knew then that you thought you were young, or felt young, or had young sympathy, anyway, and so wanted to tell you my troubles, particularly as you seem to be the target for every fellow's woes.

"We young fellows are off by ourselves. We don't get much chance. If we start to say anything, no matter how well we may know it, some wearer of whiskers will break right in and run away with the conversation. We may know just as few things if we are young. Pace tells somewhat, and things move quicker now than they did when 'old man' Lanigan was a boy. It's just barely possible that that boy of his has ideas that the old man never had. It isn't so much the gray matter on the outside of the head as the gray matter inside that counts, after all. Big feet may go with good understanding, and an awkward hand may accompany a big heart. We know that we don't know it all, but we do know just a little, and are so hungry for more. We don't want to intrude on you old fellows, but we do just want to rub up against you and acquire some knowledge by attrition, and it's just barely possible it won't make you fellows any weaker to let us. You really can't hustle the way you did once. Your joints are not so supple nor your muscles so quick, and your boys are trying to take the work off your hands and turn you out in clover, and they will do the hustling and make a place for themselves in the history of our art. You are prouder of them than you would be if their hands and feet and heads were small. No, the 'Willy boys' never bother you by crowding in for information, and you better be glad we awkward fellows are not in their class, and take us in more. Bear with us a little. We don't come in for our beauty. These conventions are not popularly supposed to be beauty shows. You would be lonesome if they were. I'm not even saying you'd be here. Just take us in more, though, and bear with us. Don't look at our feet, but think of our future. We are enthusiasts just the same as you old fellows, but we really have got a better start and more to do with than you had at our age, and, with proper encouragement, there's no knowing what we may not achieve."

GATES.

Written for THE CLAY-WORKER.

WITH THE PHILADELPHIA BRICKMAKERS.

OUT IN WEST PHILADELPHIA the warm May day sun was shining and penetrating the shady nooks with gladsome energy, commingling dust and glimmer that enveloped William Conway's trim yard and offices with almost artistic effect. This brickyard is one of the few that is free from the encroachment of the real estate speculator. The cattle graze and bellow within the adjacent meadow; his clay bank is deep and inexhaustible, and he is one upon whom nature smiles and touches lightly, content with his good digestive organs and his position as a producer to the world's consumers.

Going down the lane, I met him behind his famous driving horse, Jack, on his way to the city. After inquiries as to the health of the able Secretary of the N. B. M. A., he said: "This is too bad. I have an appointment which I am bound to keep; otherwise I'd like to stay and have a chat with you. However, go in and make yourself at home." And, with a good-bye, Jack started off at a 2:40 gait in a fine cloud of dust.

In the office I learned that last year they turned out about 11,000,000 brick, slowing down about the 8th of November, but continued burning all through the winter. Starting in again about the middle of April, things are beginning to shape themselves all right, although the floors are not yet in good condition. Next week the hand gangs will be started, and some of the famous stretchers will be turned out for which Mr. Conway has won a splendid reputation. Not only in this city, but in New York he has made large shipments, having just completed the delivery of a large order from there, which leaves a deep wave of satisfaction to be printed on the faces of employes and chief alike. In season some twelve or fourteen hand gangs are kept going, and only hand-made stretchers are turned out, with the usual hard, salmon and a first-class hollow brick. All told, some 150 men are on the pay rolls, including some twenty-five or thirty carters, and in the top-notch season some 135,000 bricks pass out through the gates, never more to return.

I inquired as to whether any new experiments had been tried in drying, and the answer was in the negative—the old-style sun and wind. As I was not talking with the principal, I did not ask for the pros and cons.

—Michael Carroll—

Was quietly soliloquizing over a cigar, convalescent from his late and exhausting attack of the grip. He is now all anxiety to get back to the yard and buckle down to the season's requirements. The spring season has not opened very propitiously for the architect or builder, consequently the brickmaker does not see very far before him. Quaker City, however, may be likened unto a yacht—if she lists too heavily to starboard or leeward she will right herself, and if the spring shows flat in prospect, the fall operations show increased energy, and the close of the year shows the average, $20,000,000, has been spent in building operations.

Wildcat operations are being suppressed, and very soon it will be impossible for other than the capitalized real estate operator to commence building, and herein lies the safeguard and shield of the brickmaker, who no longer wants to ship $20,000 worth of bricks, paid for at the rate of 50 per cent. on completion of job, and the remainder to be extracted from a worthless second mortgage.

—Eugene and Peter Carroll—

Are both up to their eyes and ears in work. The late disastrous fire has proved to be of incalculable gain instead of loss. A new dryer has been installed, and already the successful issue is a source of satisfaction to them. Working out a principle of their own, they have built up the new drying shed in easy juxtaposition with the machine shed, building up the tubes in recoil form and in three sheds, each supplied with a department containing thirty-six sections, holding 1,000 per section, or a total of 108,000, with ample provision for supply and cut-off, throwing the heat into the two sheds while the third is cooling off, recoil steam being used during the day and full power at night. The first experiment showed that with very little extra pressure on the old machine, the full batch was set in at 3 p. m., and was thoroughly dried on the following morning at 9 a. m. Since that time two to three hours have been chipped off the time schedule, and the boys are jubilant.

W. P. LOCKINGTON.

A BRICK MACHINE MANUFACTURER FOR GOVERNOR.

—W. T. Durbin, President Anderson Foundry and Machine Works, Chosen to Lead the Republican Campaign in Indiana.—

WE HAVE FREQUENTLY REMARKED that brickmakers are much given to politics, and it is no uncommon thing for them to figure conspicuously in the affairs of State. Just now our patron, Winfield Taylor Durbin, President of the Anderson (Ind.) Foundry & Machine Works, manufacturers of brick machinery, is a candidate for Governor, having been nominated by the Republican State Convention April 26. If elected, and he stands a fair chance, as the present incumbent is of the same political persuasion, he will bring to the high office splendid executive ability.

W. T. Durbin, Anderson, Ind.

Mr. Durbin is a native Hoosier. He was born at Lawrenceburg, Ind., May 4, 1847. His father was a tanner, and young Durbin learned and worked at that trade. Though but a lad of thirteen when the War of the Rebellion began, he and all of his brothers, there were seven of them, enlisted. His extreme youth made it difficult for him to pass muster and he was rejected three times before he was finally accepted as a drummer boy. This quality of persistence in whatever he undertakes has enabled him to achieve success in many important undertakings. Returning from the war, he taught school for a time and then came to Indianapolis and secured a position as bookkeeper in a large wholesale dry goods house. He was promoted from time to time and after ten years of service with that firm went to Anderson and engaged in business for himself. His chief business there being that of a banker. In 1890, he became interested in the Anderson Foun-

dry & Machine Works, with which he is still connected.

During the war with Spain, and while troops were being mobilized at the Capital City, he acted as paymaster and Indiana agent between Washington and Governor Mount, and was afterwards appointed colonel of the One Hundred and Sixty-first Regiment, and served with distinguished ability. Col. Durbin has taken a leading part in the affairs of his party for several years, and if a thorough knowledge of the political situation, untiring energy and a splendid record both in private and public life can avail, he will certainly fill the Governor's chair.

Written for THE CLAY-WORKER.

EXACT INSTRUMENTS FOR CLAYWORKERS.

UNDER THIS HEADING it is the writer's intention to compile illustrations of instruments which are being used or might be applied in the clay industry for the purpose of reducing vague data to more definite, numerical terms. Not all of the instruments are suitable for application in the routine of a clayworking establishment, but most of them could serve to enlighten us in some way or another. Of course the list of instruments is by no means complete; it would be an impossible task to bring all the instruments used in ceramic research work within the scope of this article. The chemical apparatus, as well as instruments like the microscope, have been entirely neglected since they are well known to those who have occasion to use them. The reader's indulgence is asked for the use of technical terms which it is impossible to avoid without giving rise to confusion. Owing to the limit of these papers the instruments cannot be discussed fully from the standpoint of the clayworker, but reference must be had to other articles which have appeared in this journal. The metric system has been used wherever dimensions are quoted, it being the standard of all accurate work the world over.

The Schoene apparatus for the mechanical analysis of clays. Fig. 1.

By mechanical analysis is meant the separation of a clay into particles of different sizes. It is a well-known fact that the size of the clay particles, of the sand and other nonplastic matter, influences the character of the clay to a large extent. The Schoene apparatus has found considerable application in this physical analysis of clays and in its principle depends upon the fast that in a tube in which there is a constant flow of water from the bottom to the top, different sizes of particles are carried off, depending upon the velocity of the flow. The more rapid the flow the larger the grains carried away. Thus, by adopting, say, four different velocities of flow, calculated for suitable sizes, four grades of grains will be obtained, since the sizes are proportional to the squares of the velocities.

The apparatus itself consists of the washing or separating funnel, A, which at the bottom ends in a bent tube, A C, and at the top is connected with a narrow tube, 1 meter long. The latter is Z-shaped in its lower part and is carefully graduated about half the length of the long tube. At the bend, L, there is an opening of 1.5 millimeters diameter through which the waterway flows. The water is supplied from the tank, C, and the supply is regulated by means of the stopcock, E, so that in the funnel, A, there is always a definite velocity of water, from bottom to top. The rapidity of flow depends upon the amount of water entering the funnel per second; knowing the amount of water and the cross section of "A," the velocity is equal to the quantity divided by the cross section. The water flowing in is directly measured by allowing it to run into a measuring vessel for a definite length of time, care being taken to see that the water in K remains at the same level, which is the case as long as the velocity is the same. In this manner the water flowing per second is easily calculated.

The cross sectional area in A is determined by means of known volumes of water allowed to run into it and measuring the height reached after each addition of water. From the volume and height the diameter and hence the area can be calculated.

The velocity of flow must be calculated for a number of levels in the long, Z-shaped tube, called piezometer, from which then there is calculated the velocity in A. For any desired velocity it is then only necessary to regulate the stopcock, E, so that the water remains at the corresponding level in the piezometer.

To every velocity there corresponds a size of grain determined by calculation. For convenience sake five sizes have been adopted, as follows:

1. Particles removed by a flow of .18 millimeter per second, called clay substance. Maximum diameter .01 millimeter.
2. Grains removed by a flow of .70 millimeter per second, called silt. Maximum diameter, .025 millimeter.
3. Particles removed by a flow of 1.5 millimeter per second, called dust sand. Maximum size, .04 millimeter.
4. The residue remaining in the funnel is called fine sand. Diameter, .04 to .2 millimeter.
5. Coarse sand, everything larger than .2 millimeter.

Every instrument must be standardized before being used, and for this purpose it is most convenient to base the work upon the mathematical formulae which have been deduced for this purpose. Owing to the lack of space within this article and since this instrument will hardly ever be used by the practical clayworker, the writer does not think it necessary to quote the mathematical expressions, which are, however, very easy to apply. For a detailed account of the Schoene apparatus, including the calculations, the reader is referred to the German book: "Die Natur der Ziegelthone," by Zwick.

In regard to the practical execution of the analysis it might be said that usually ten grains of the dried sample are taken and boiled for about an hour. The cool mass is first put through screens, weighing carefully the residue on each sieve, and is then placed into the washing funnel.

—Measuring Plasticity and Bonding Power.—

In the series of articles under the heading "Modern American Front Brick" mention was made of using the tensile strength of dried clay briquettes as a measure of plasticity, and, by mixing the clay with increasing portions of sand, also as a measure of bonding power. For this purpose the clay is made up into briquettes resembling the figure 8 in shape, and are pulled in two by a suitable registering machine.

Fairbank's testing machine is a good example of this apparatus (Fig. 2), but, like the Schoene apparatus, it is never likely to come into general use. After all, the data obtained by means of it are of more interest to the investigator than to the practical man.

—Seger's Volumeter.—

Not infrequently it is most desirable to determine for a given clay the shrinkage in drying and burning, as well as the porosity and sometimes also the specific gravity. The accurate determination of shrinkage can only be had by finding the decrease in volume. Likewise, in the determination of porosity, it is essential to know the volume, since the pore space is expressed in terms of the volume of the test piece.

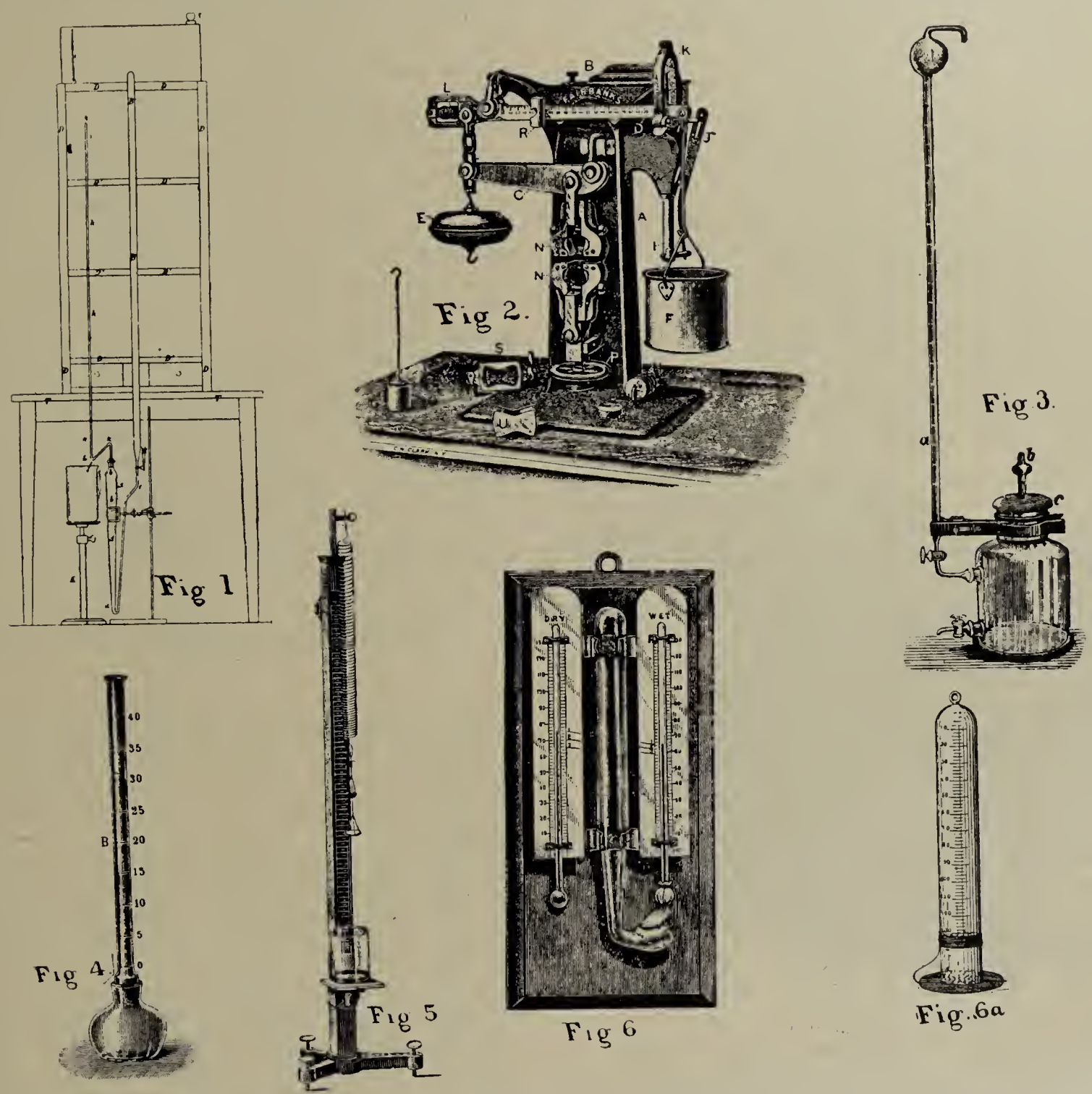
The instrument used by Professor Seger for this work (Fig. 3) consists of a bottle provided with an outlet cock at the side and connected with a long, narrow measuring tube, graduated into tenths of cubic centimeters and having a bulb on top. The wide mouth through which the test pieces are introduced is closed by a ground glass stopper through which a hole is bored, which connects with a small, thin tube. The latter is provided with a mark. To the upper end of the measuring tube there is attached a rubber tube, which may be closed with a pinch cock.

The liquids used in connection with this instrument are

water and petroleum; water, if the volume of burned clay is to be determined; petroleum, if green, dried clay is the subject of testing. The petroleum used for this purpose is a nonvolatile oil of specific gravity .8 and having a boiling point of 180 degrees centigrade. Oil of turpentine might also be used.

In order to determine the volume of a piece of clay the latter is allowed to soak in water or oil, according to whether it is burned or unburned, for two hours. This is done in order to saturate the piece superficially, so that no liquid is absorbed during the determination of volume. While this is being done the instrument is filled with the liquid by taking out the wide stopper; the latter is then replaced and more liquid added through the small tube, so that the level is above the mark and also above the corresponding mark called the zero point on the long tube. By means of the lower stopcock the liquid is removed slowly, so that the level of liquid is exactly at the mark in both tubes. By slowly moving the bottle to and fro any air bubbles in the liquid are expelled through the small tube. The instrument, of course, must stand on a level surface. When ready for the determination of volume some of the liquid is drawn up the long tube by means of the rubber tube till the bulb on top is nearly filled with the liquid; the stopcock at the bottom of the tube is then closed. The stopper of the bottle is now removed, and the test piece, which must be carefully wiped, is placed into the bottle, taking pains not to spatter any of the liquid. After replacing the stopper the upper stopcock is opened a little and enough liquid allowed to descend into the bottle till the level is again at the mark in the small tube. After ten minutes the number of cubic centimeters occupied by the piece may be read off from the height of the liquid in the long tube.

If now it is desired to determine the cubical shrinkage of a clay in drying or burning it is but necessary to determine the volume of a test piece when wet and dry or green and burned. The difference in volume is of course the cubical shrinkage. Both determinations of volume are carried on the same, except that for the green piece petroleum or oil of turpentine must be used in place of water. The linear shrinkage is obtained by extracting the cube root from the value of the cubical shrinkage.



1. Apparatus for Mechanical Analysis of Clays. 2. Fairbank's Testing Machine for Tensile Strength. 3. Instrument for Measuring Volume. 4. The Schumann Volumenometer. 5. Specific Gravity Balance. 6. Hygrometer. 6a. Atmometer.

In order to determine the porosity of a test piece it is but necessary to place the well-dried specimen into the bottle without previous soaking and allowing it to remain there for two hours. After that time the volume of the piece is read off in the usual manner. Evidently this value must be smaller than the real volume, because some of the liquid has been absorbed by the specimen, depending upon the degree of porosity. Hence, for determining the true volume, the piece is removed from the bottle, wiped and replaced, after having the liquid in the latter filled up to the mark. The

difference between the true volume and the first reading is equal to the volume of pore space. The volume of pore space divided by the volume of the specimen and the quotient multiplied by 100 will give the percentage of porosity.

The porosity may, however, be determined in another way, by noting the weight of liquid absorbed, the specific gravity of the latter and the volume of the test piece. In this case the porosity is calculated by means of the expression:

$$P = \frac{\frac{g}{s}}{v} .100$$

where P stands for porosity expressed in per cent. of volume, g for weight of liquid absorbed, s for the specific gravity of the liquid, and v for the volume of the test piece. From the same data the specific gravity of the green or burned clay may be easily calculated from the formula:

$$S = \frac{G}{V\left(\frac{100-P}{100}\right)}$$

in which S stands for specific gravity of the clay, G for the weight of the dry piece of clay, V for its volume, and P for its porosity.

By means of the Seger volumeter it is possible to determine volume, shrinkage, porosity and specific gravity.

The specific gravity of clay may also be determined quite rapidly by means of the Shumann volumeter (Fig. 4). This instrument consists of a glass vessel holding about 200 cubic centimeters fitted with an open graduated tube. When using the apparatus the bottle A is filled with water or oil of turpentine, depending upon whether green clay or burned is to be made subject of a test, and the tube B is inserted. By means of a glass tube more of the liquid is poured into the long neck till the level reaches to the zero point, being careful to remove any air bubbles. An accurately weighed amount of clay, usually 100 grams, in a finely powdered condition, is then introduced into the bottle by means of a long funnel. None of the powder must be allowed to adhere to the tube. After a few minutes the number of cubic centimeters occupied by the clay is read off and the specific gravity calculated by dividing the weight of clay used by the number of cubic centimeters.

Still another means of determining specific gravity is offered by the Jolly spiral balance (Fig 5), the principle of which is extremely simple. The main parts of the instrument are two scale pans, one of which is always immerged in distilled water when making a specific gravity determination, and a long spiral. In using the balance three readings are made; first, the position of a mark as defined by a graduated mirror scale, is read before weighting the balance; second, the position of the mark is observed after the upper pan has been weighted, and the third reading is made when the substance has been put in the lower immerged pan. The weight of the loss in air divided by the loss of weight when under water will give the specific gravity.

—Instruments Used for Determining Conditions in Drying.—

It is often useful to know the state of air in regard to contents of moisture; that is to say, to know how much moisture it contains. Air containing little moisture has the power of drying more rapidly than air already saturated with aqueous vapor. If the drying is proceeding too rapidly for the best quality of ware the process can be slowed up by permitting the air to become moister, by checking the draft or lowering the temperature of the dryer, and vice versa. Although there are a number of so-called hygroscopes they are more or less unreliable, and exact instruments for determining the humidity of the air, such as Regnault's hygrometer, are too delicate and troublesome. The simplest hygrometer is the so-called wet and dry bulb thermometer. This instrument is sometimes called Mason's hygrometer (Fig 6). It consists of two exactly similar thermometers, mounted on the same stand in such a way that the air can circulate freely around their bulb. One thermometer is used merely to give the temperature of the air; the other has its bulb covered with muslin, which is kept moist by means of an attached wick communicating with a vessel of water. The evaporation which takes place from this wet bulb produces a fall in temperature, and consequently the wet bulb thermometer always reads lower than the dry bulb. It is evident that this difference in temperature between the two thermometers, depending as it does on the cold produced by evaporation from the wet bulb, will be proportional to the rate at which evaporation takes place. This depends on the amount of moisture already in the air, and thus the difference of temperature of the thermometers is indirectly related to the condition of the air. Roughly speaking we may say the greater the difference in temperature of the hygrometer the dryer the air, and vice versa. By properly watching the condition of the dryer and noting the difference of temperature a satisfactory empirical indicator may be had by the use of this instrument. It cannot be called exact, owing to several theoretical considerations whose discussion here would, however, be out of place.

Another still more empirical yet useful instrument is the so-called atmometer (Fig. 6a). This little piece of apparatus measures the rate of evaporation of water. It consists of a glass tube, about 1 centimeter in diameter, .4 of an inch, and graduated with fractions of cubic centimeters. At the bottom a wire spiral is fastened to the tube, pressing a piece of blotting paper against the opening. The glass cylinder is filled with water when in the inverted position, and the blotting paper pressed against the opening. The tube is now placed in the proper position, with the paper down, and the level of water is noted. Of course the dryer the air the more water will be evaporated per hour, and the amount of water which ought to be evaporated in a given length of time can be determined by experiment. It is essential that the paper be thick blotting paper, which does not allow the water to leak through, but is simply kept moist. The writer has never had any experience with this instrument, but it might well be worth a trial.

AN AMERICAN BRICK MACHINE DOING GOOD WORK IN CHINA.

Hong Kong, China, April 4, 1900.

Messrs. Chambers Bros. Co., Philadelphia, Pa., U. S. A.:

Gentlemen—The brick machine you supplied us last year has now been working for several months and has made nearly three millions of bricks. Its working has been altogether satisfactory.

When we commenced operations I took an intelligent coolie (laborer) and showed him how to regulate the supply of water, etc. In two days he was able to turn out material of uniform density, and after using up a dozen safety pins, everything went well.

One of the most satisfactory points about the installation is that the pugging is so perfect that only 15 per cent. of water is required to make a coherent brick. We expected 20 per cent. would be necessary. As this water has to be evaporated at a cost of so much coal, the 5 per cent. saved is a very important item.

The working out of every mechanical detail about your machines is admirable and a source of pleasure to me every time I see them.

The friction clutches justify all you write about them. They have completely overcome my prejudice against the substitution of a clutch for fast and loose pulleys.

There is every prospect of our enlarging our plant this year, and I hope shortly to indent for another mixer and brick machine.

Please receive herewith some views of our works, which may interest you. I am sorry that it is not possible to get another photograph of your brickmaking plant.

I remain, gentlemen, yours faithfully,

(Signed) W. H. HEWITT, Engineer.

Written for THE CLAY-WORKER.

SOME COSTLY BITS OF EXPERIENCE.—No. 4.

L. C. Moore.

THE NEW AUTHORITIES on clayworking were ready with their advice. They, too, tried a sample of his clay, and for some reason did not discover the real trouble. They were manufacturers of stiff mud machinery, and readily laid the blame upon the dry press process. They argued that dry pressed bricks were not good for general purposes and stiff clay bricks were superior to them for all purposes. The result was that the dry press was deposed, and a stiff mud auger machine installed in its place. He had always set his dry pressed bricks into the kiln direct from the machine, and had no arrangements for a drier. Of course one had to be provided now that he had changed his process. Considerable money had to be expended for this purpose. He decided that he could not afford a steam drier after all the great expense he had gone through, but would make some sort of outfit for natural air drying. Here, for once, luck favored him. His clay would dry in the sun without checking, a very rare property in clay in our section, after it had been subjected to the pressing and polishing in the die of a stiff mud machine. Still, there was considerable expense attached to his outfit, for shelter had to be provided in case of storms. He found by the time he had completed his stiff mud plant that he was several hundred dollars deeper in debt, and the brickmaking season for that year was almost gone. But he must improve every moment left to him, and he at once began operations. Like his first outfit, this one worked well, for an experienced man set it up and put it in motion. His machine was of large capacity, the weather was fine, and soon a kiln of stiff mud bricks was completed. It was getting late in the fall, and he decided to make but one large kiln of 200,000, and then shut down for the winter. It was near Christmas when he completed the burning of this kiln, and he had no chance to do any brickwork that fall. But he congratulated himself in having a goodly number with which to meet the spring demand. Customers were somewhat skeptical of the quality of his bricks—in fact, they were of the opinion that all machine made bricks were a failure, and that there was nothing equal to the old hand mold bricks. But again he guaranteed them, and as the market was not well supplied by his competitors he succeeded in selling his good bricks, and collecting money enough to straighten out matters sufficiently to begin operations again at the factory. But his stiff mud bricks stood the weather but little better than had the dry pressed. The first rains caused them to go to pieces, and again he had to meet failure face to face.

He wrote at once to the machinery company and they sent a man to look matters over. It chanced that he knew his business and soon properly diagnosed their case. They must avoid the lime pebbles that were very plentiful in his clay. Search was made to definitely locate the trouble, and the lime was found to exist only in the top stratum of clay, which could easily be stripped, leaving many feet in depth of the finest raw material to be found in the West. It is a long lane that has no turn, but it seemed that the turn had come almost too late to save this manufacturer from bankruptcy. He had spent all of his own money and a considerable amount for his confiding friends, and now that he saw his way open for accomplishing some good, if he only had the capital, he found himself without that very necessary aid to a successful business career. He still owed for the greater part of the prices of each outfit and each company was equally anxious for a settlement. Second hand brick machinery will bring but a small per cent. of the original cost when forced to a sale. The machinery companies realized this, and made very liberal propositions for settlement, if he could make any arrangements to proceed with his work. His prospects were good if he could only get in ship shape once more.

He made one more effort, mortgaged some of his wife's real estate, and again commenced to manufacture bricks. However, his struggles were not over. He was handicapped by poor kilns, poor burner, and worse than all, a poor reputation for his bricks. It takes a long time to rebuild a broken down reputation, whether of a man or of his products. People would not believe in machine made bricks after witnessing such signal failures, and only long and continuous demonstrations of superiority would ever convince them that their judgment was incorrect. No argument from a scientific standpoint could convince them that what they had seen was caused by small bits of limestone that could be easily removed or avoided. They knew that machine made bricks were a failure, for they had seen them tried and proven worthless.

But perseverance and merit will finally win against all odds. His bricks were now exceptionally fine. Some of his creditors took them in payment for debt. The bricks stood every test and soon began to rebuild their lost reputation. Within a year's time, he began to retrieve his lost fortune. His factory has been running now ten years, and both dry pressed and stiff mud bricks are made there. Both outfits are paid for, and his credit is good for another if he cared to purchase one. But one brickyard at a time is enough for him. Should he ever sell this one and decide to start another, he has a few thousand dollars worth of costly experience laid by for use on such an occasion.

JEFFREY COLUMBIAN SEPARATOR-SCREEN-BOLTER.

With this we illustrate the Jeffrey Improved Columbian separator. This separator has made a wonderful record in the cement industry, while it has also gained a strong hold in

The Jeffrey Columbian Separator-Screen-Bolter.

other industries, more especially in the treating of ores, lime, sand, phosphate, rock, each, clay, etc.

It is built substantially of hardwood and consists of a well built frame in which the vibrating screen is located. The screen frame is connected to eccentric rods which give it a quick movement, and being confined at its corners by special nut and screw device, the vibrations thus made keep the screen in a perfectly live state. The screen frame is adjustable, so that it can be set at various degrees of inclination, to suit the material handled.

Another important feature of this screen is the feeding device which consists of a special spiral conveyor and casing, so made as to distribute the material uniformly over the entire surface of the screen.

Special circulars relating to this screen can be had by addressing the manufacturers, The Jeffrey Manufacturing Company, Columbus, Ohio.

Written for THE CLAY-WORKER.

BUILDING MATERIAL IN CUBA.

Louis H. Gibson.

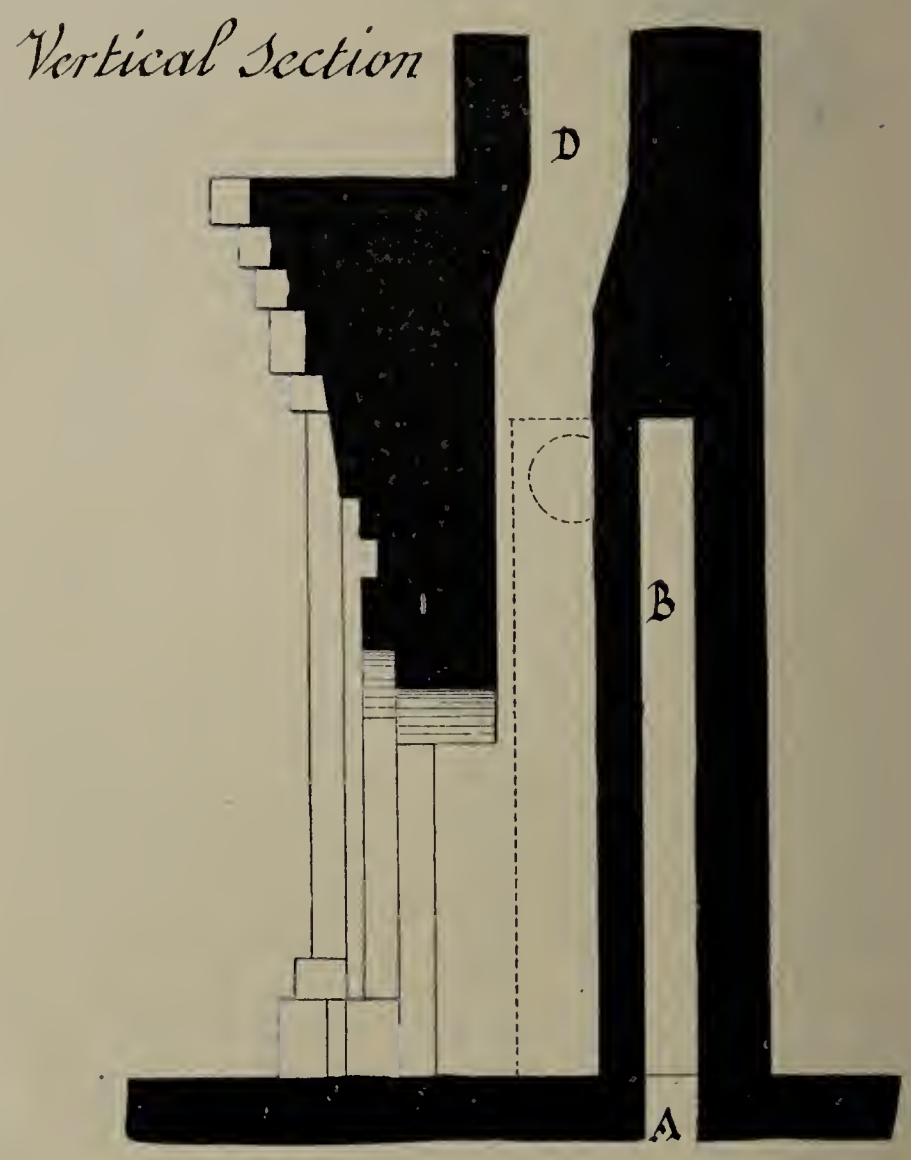
HAVANA is now one of the cleanest cities in the world. This is due to the organizing capacity of the United States Army. Previous to January of a year ago it was one of the dirtiest cities in the world. From curb to curb streets were covered with all kinds of filth, and some of the oldest inhabitants did not know what the underlying pavement was made of. So it appears that one way to protect a street, one way to save it from wearing out, is to allow it to become covered with filth, not to remove it. That is the way in Havana. Most of the streets there are covered with stone blocks of one kind or another, and after they were covered with all kinds of filth and dirt the proper street covering did not have to carry the strain. After the streets had been cleaned the Cubans complained that clean streets were noisy, that there was none of the cushion of the filth and dirt to reduce the noise of moving vehicles. That is a part of Cuban appreciation.

Now, as to the building. The writer has seen many of the cities of this country, is engaged in the building business, has seen many of the cities of the old world, and he has this to say for the buildings of Havana. Havana is a better built city than any city that he knows of in the United States. Under normal conditions it would cost less to insure the city of Havana per dollar of investment than Boston, New York, Chicago, Indianapolis, St. Louis, or any other city in the United States. Why is this true, may be asked? Because Havana is a better built city than any of the others that have been named. Not but that New York and some of the other cities have a few better buildings than the city of Havana, but because the average of the buildings in that city is much better than those named.

A fire is so rarely known in the Cuban city that the fire department is in truth a social organization. No one can rise to higher distinction than to be a member of the fire department in that city. He is relatively a member of the four hundred. Now, we all know that an overworked fire department cannot be a social body.

I say that Havana represents a very low risk to the insurance companies. This, of course, is proof positive of its constructive excellence. What are the physical conditions which developed this low rate of insurance, is a natural question? The simple statement is, good construction. Of course there are a few flues in Havana. Heating stoves have no market; they are not needed. But without that condition, even then the rate of insurance in that city would be lower than we know, even if there were a flue in every room in every house, and even if there were a heating stove in every room in every house, even then the insurance rate would be lower. Havana is essentially well built. The walls are of stone, brick and concrete; they are heavy. There are no wood partitions. The floors are covered with tile, or cement, or brick. Wood floors are practically unknown. The ceilings are rarely plastered, they are either arched or of solid wood timbers, the timbers are covered on the top with concrete and on the concrete either the finished floor or cement or brick. All of the walls, whether they be of stone or concrete, the brick are covered with stucco on the outside and on the inside with plaster. The inside partitions are either of thin brick walls or of concrete, and they are covered with plaster. The roof timbers are coated on the top with concrete and finally covered with roofing tile. Most of the roofs are flat, the tile are laid the same as a floor tile. The projecting cornices on the outside, and those, of course, on the inside, are never of wood, never of combustible material, but always of cement or stone, or other noncombustible substance.

Brick on the island is, of course, a very expensive material. There is practically no fuel. Many of the brick are sun dried; those which use fuel must necessarily be expensive. Stone is an ever present substance, the coast is lined with it, the soil, however deep, is underlaid with it. Heretofore the flat tile which covers the roof, and the other tile which covers the steep and high pitched roofs, have been brought from Spain, and Spain saw to it, by duty and otherwise, that material was not brought from other sections of the world. Now, however, since the occupancy of the country by the Americans, we see



Scale 1½ inch per foot

Legend

A Introduction of cold air from outside by means of a air passage under the floor.
B Air chambers behind the fire place where the introduced air become hot and is admitted in the rooms by air registers C C.
D Smoke funnel.

roofing tile and floor tile and tiles for walls and dados being brought from France.

Cement, as in all Latin countries, is a dominant building material. A large proportion of the building materials used in Latin countries comes to the building in sacks. It is either of cement or sand. Sand is very expensive in some of the

cities in that island, and even made of broken stone. Labor is cheap, stone is cheap, so is lime.

What is said of Havana is typically true of the other cities of the island. The only difference in the construction of a city like Mantanzas is only a question of decoration. Matanzas is as well built as Havana, but not so decorative. This is true of the smaller towns. It is not a question of building construction, but a question of ornament. I was in towns and cities which had been raided by the insurgents and Spaniards and efforts had been made at destruction. The floors had been removed, and the doors and windows torn out, but the walls and partitions were there in all of their original excellence. This high grade of construction applies to the towns and cities. It does not apply to the country. The farm houses are made from small branches, the limbs of trees and from the leaves of the palms. These houses are not worth insuring, and not worth taxing, but generally speaking the building of the towns and cities of Cuba are better than anything that we are generally familiar with.

Written for THE CLAY-WORKER.

BRICK MANTELS.

—An Improved Method of Construction for Heating and Ventilating.—

THERE IS SOMETHING pleasing and substantial in the appearance of even a plain brick mantel and fireplace that makes a room more inviting for its presence. Decorative brick mantels are now quite popular in costly dwellings, but they are too expensive to come into common use.

We submit a sketch of a moderate cost brick mantel that the humblest cottage might contain. If good judgment is used in its construction, a very attractive design may be worked out with ordinary building brick. The method of construction suggested will, too, give a largely increased heating capacity.

—Method of Construction.—

The uppermost course is laid close so as to form the top piece of the mantel. The second course of bricks from top is laid alternately in and out, so as to form a modillion.

The fourth course is laid on edge and crosswise, forming an indentation. The pillars on each side and above the arch—the brick are laid back from the vertical line about an inch—are made with dark-colored brick.

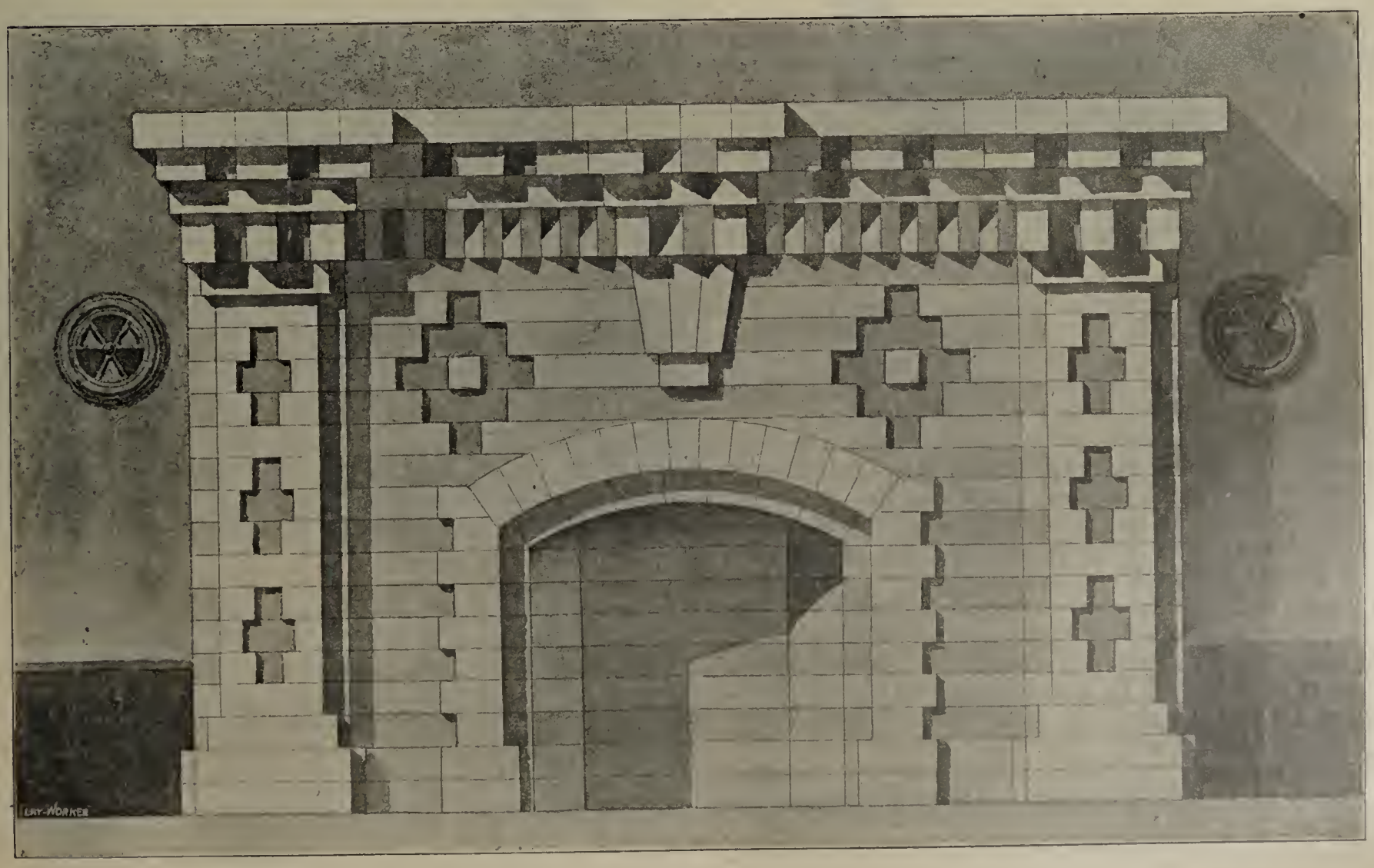
The walls inside of the fireplace are inclined so as to reverberate the heat toward the room, and are of four-and-one-half-inch thickness, having behind a chamber where the cool air from outside is heated and then admitted to the room by means of the registers or ventilators, to replace with pure air the quantity of it necessary to the combustion in the fireplace.

The ventilators are let out in the side of the mantel, but for convenience of the demonstration are shown laterally to the mantel at the proper height. See vertical section of mantel on preceding page and horizontal sections on the following page. E. LANZONE.

A NEW FIELD FOR BRICKMAKERS.

The consul general at Bangkok, Siam, points out to business men in the United States that a big building boom has begun in that city of from 500,000 to 1,000,000 inhabitants, and he estimates that at least 2,500 buildings, constructed mostly of tile, brick and corrugated iron, were erected during the past year. In that connection he calls attention to the fact that a splendid opening for brickmakers is offered. The brick made by the natives are rough and unsightly and poorly baked. There is an abundance of good clay along the Gulf of Siam and canals to take the brick to market. Most of the cement comes from Europe, and the consul suggests that American cement of the second quality could be sold there to advantage. He recommends the second quality because the first quality sets too quickly for the slow native workmen, who, like all the people of Siam, are very deliberate in their movements. American corrugated iron, he declares, could also be sold in Bangkok, but it must be of a quality which will suit the natives. It must be easily penetrated by nails, must be waterproof in the heavy rains, and also thick enough to prevent warping in the intense tropical heat.

Fire place ~ facade



Written for THE CLAY-WORKER.

BRITISH CLAY NEWS.

—What the English Brickmakers Are Doing—London's Vast Building Interests—Brick Building Predominates in the Great City.—

NOTWITHSTANDING the general prosperity of last year the brick trade benefited only in sections. Everywhere wages and prices went up and demand was continuous, but the clay handler often found himself threatened with a balance on the wrong side. For example, in Kent and Essex, a couple of populous southeastern counties, the brickmakers found the trade going from very fair to bad as the year wore on, and now the view they take of this season is one of unrelieved gloom.

They blame very largely the excessive competition which hails from the Midland and Birmingham districts where production has been intensified of late. Three or four good seasons have followed one another for the Essex and Kent clayworkers since the strike, but now a decided reversion is evident, and, as prices are sinking slowly but steadily, there is every prospect that the manufacturers will be compelled to recoup themselves by recalling the twenty per cent. increase in wages given to the operatives.

Belfast tells the same story of slack trade last year, and an outlook for this year marked by keen competition and a perpetual weakening of prices. Two thousand fewer brick buildings were put up in Belfast last year than in 1898, and seven hundred fewer than in 1897.

Centers, such as Newcastle-on-Tyne, the great sea door for the northern coal mining regions, tell of a year of extensive trade. In the fire clay business, the oldest inhabitant knows of none busier. In the production of fire bricks the demand last year is superior to any since the prosperous years between 1872 and 1874.

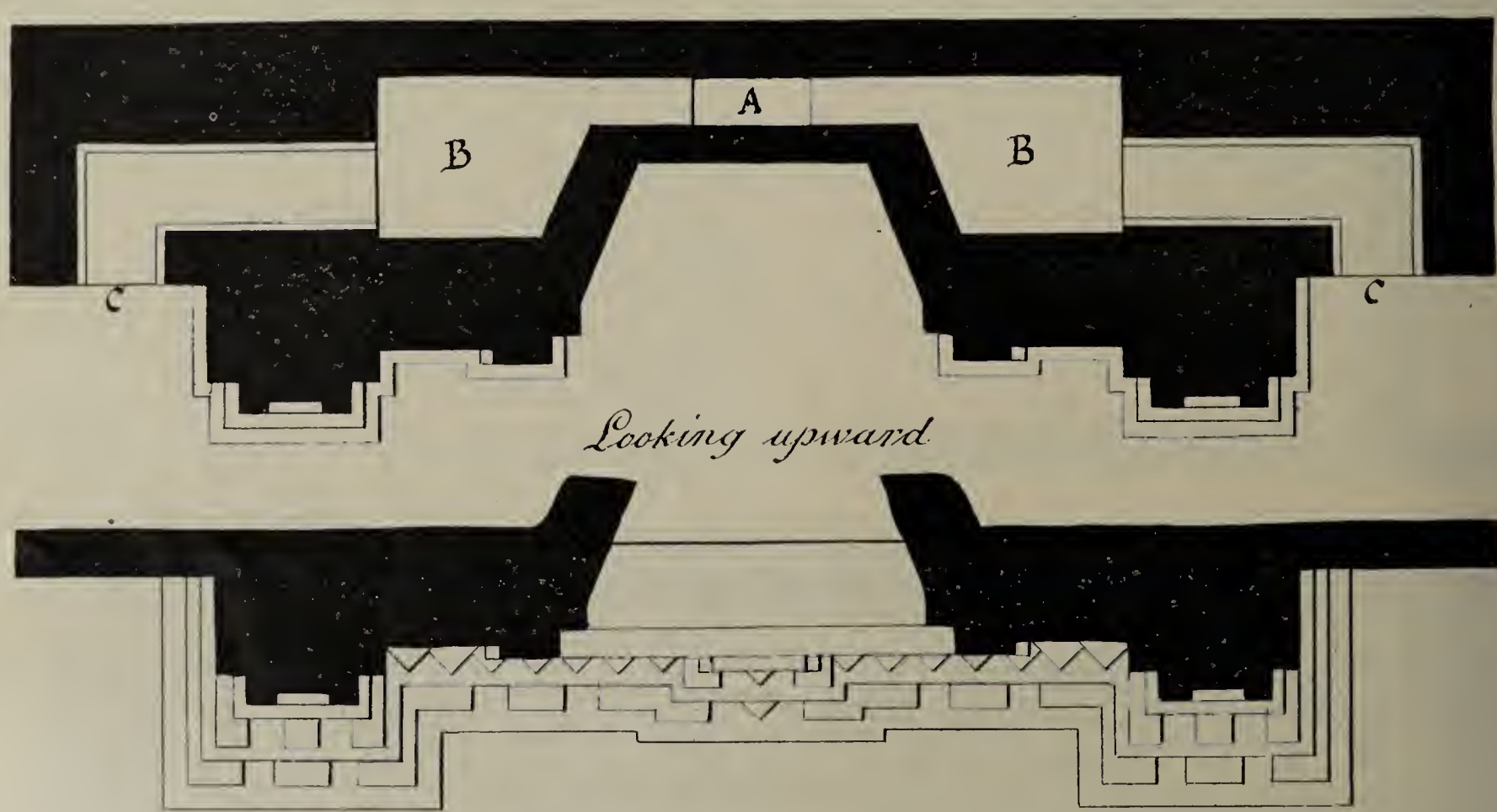
But the prosperity brings its own troubles. For instance, in Exeter, where the brickyards have been in profitable and active use for a long time past, the house builders are going in for brickmaking themselves. They have not yet ceased to buy bricks from the three local works, but they are hard at work getting a complete plant erected and then expect to very soon have their co-operative scheme in operation.

Blue brick, which are in heavy demand for engineering, sewering and water schemes, found a brisk market last year and one which gives every promise of continuing for some time ahead. Prices are on the rise and are such that, notwithstanding the high price of fuel occasioned by the war, satisfactory profits will be earned.

The London market is a standing one. The great metropolis spreads out on all sides—an irregular shape, roughly inclined to be oval—and the builder conquers the surrounding country with great armies of brick, an army of occupation in the truest sense of the expression. On the northern heights, about Hampstead and Muswell Hill, you find the general tendency is toward blocks of flats, each flat containing from five to eight rooms on a floor and fitted with every convenience of an isolated house. Then, as you veer around to the northeast, you catch a glimpse of an ocean of little brick cottages of about six rooms each, thousands of them packed together in the hundreds of short streets of Wood, Green, Tottenham, Edmonton, and farther round. And so you can continue your journey around the outskirts of this huge city. There is Leytonstone on the east, a genteel suburb lying right beyond the old foul and fetid slums of the East End proper. Leytonstone is built on what was the open rural Essex of a few years ago, and in a land of flats or larger houses. Right away to the south is Denmark Hill, Tooling and Wadsworth, all given over either to the small cottages or great blocks of flats.

The number of new houses built in London from 1949 to 1897 was 633,615, and when the figures were calculated there were also nearly 7,000 houses in the course of erection. It must be remembered that London is always changing in its center. The London County Council has great re-housing schemes in operation. One of these is just completed and it has transformed one of the vilest and most unsanitary slum districts of Bethnal Green into a beautiful little brick city, with avenues of trees, paved playing grounds, and a small park. Houses for 5,000 people had to be erected. Then, again, this Council has some new central thoroughfare schemes in hand.

Horizontal Sections — Looking downward



These new roads are to be driven through crowded districts and will mean the demolition of unhealthy and inartistic streets, and the building of long, regular and beautiful business avenues, lined with brick buildings of the most durable and artistic type.

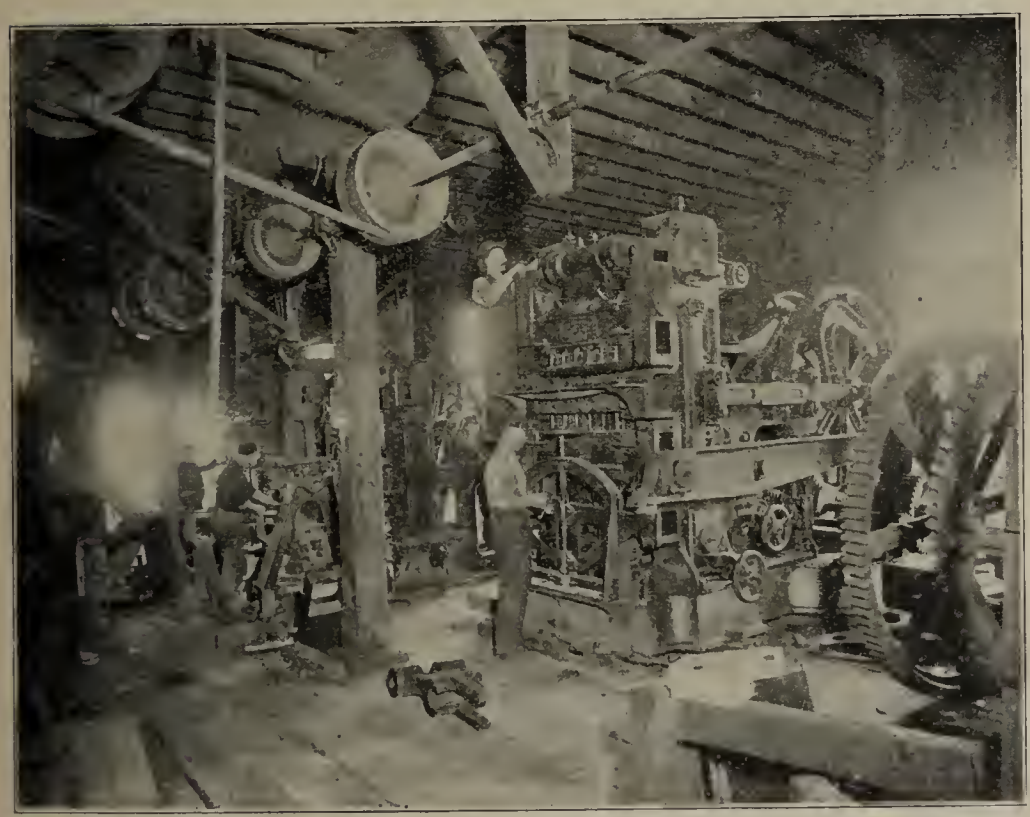
British brickmakers have but to come to a more cordial understanding amongst themselves to universally reap a golden harvest of honestly won profit from all this.

Since the inauguration of the Workmen's Compensation Act, employers of labor have to face a very serious risk of loss by accidents occurring to their work people. Clayworkers, especially, saw this, and hence there has arisen the British Clayworkers' Mutual Insurance Co. For a small premium the brickmaker, etc., is relieved from worrying about claims for compensation. If his workman is injured and sends in a claim for a certain amount, the employer passes the demand on to the insurance company. So economically is the concern worked, that for the first year of trading it pays all claims and a 10 per cent. dividend to members. Premiums were $14,735, and claims $3,895.

Makers of glazed brick are likely to have trouble with the home secretary. This minister proposes bringing glaze manufacturers under the heading of people carrying a noxious trade, because of the lead compounds used to secure brilliancy, etc. This will mean a large expenditure of money to carry out many stringent rules, or else the abandonment of lead glazes and a consequent higher expenditure for fuel for firing non-lead glazes. There is a strong demand for lead glazes now.

The building and allied trades of this nation are providing, mainly by donation of materials, six cottage homes for about one hundred disabled soldiers from the South African campaign. Eastwood & Co., the great clayworking firm, have donated 750,000 ordinary bricks, and Lawrence & Co., of Berkshire, 25,000 red facing.

British brickmakers who have taken to using traction en-



Erecting a Fernholtz Press.

gines for drawing their productions over the roads are finding themselves saddled with demands from local authorities for "excessive" use of these roads. A man at Leicester has just been assessed $525 on this plea for last year. There are evidences that clayworkers will unite, however, to fight this new extortion.

T. R.

The difference between success and failure, greatness and insignificance is largely a matter of invincible determination and energy.—Exchange.

A VERY BUSY FACTORY.

The Clay-Worker's scribe recently called at the shops of the Fernholtz Brick Machinery Co., 1214 Poplar street, St. Louis, Mo., and was very cordially welcomed by Wm. F. Scott, the affable secretary and treasurer of the concern, who said in answer to our query, "How's business?" "Oh, we are well satisfied with our trade. Feel that we have had our share of orders, but, of course, will be glad to book still more. As you see by looking through our place, we are running full handed and while we haven't the largest shop in the world, we can turn out a lot of supplies, and a goodly number of

Interior of Machine Shop of Fernholtz Brick Machine Co.

Fernholtz presses in a reasonable time." This the reader may judge for himself for we present a couple of interior views of the plant, which speak for themselves. They aim to make what they do turn out as near perfect as possible and the painstaking care is no doubt one of the secrets of their success. "Once we get an order," said Mr. Scott, "we try to fill it in such a manner as will make the purchaser our friend and insure a continuance of his patronage."

This is certainly a wise policy and will prove a winning one. The popularity of the Fernholtz presses, clay pulverizers, clay mixers, and other brickyard supplies will certainly grow with acquaintance.

HIGH PRICED HELP AT THE BRICK WORKS.

As our readers have been told in the past, the Chattahoochee Brick Co., Atlanta's chief brickmaking concern, employs a great many convicts at their plant. Most of the work is performed by prisoners leased by the year from the State. The brick company pays a nominal price for their time and agrees to properly feed, clothe and care for the men and are responsible for the safe return of the men at the expiration of the term of the lease. Most of these workmen are ordinary criminals convicted of minor offenses, but occasionally they "entertain" men of note. A case in point is now being commented on by the local press. Thos. J. Hunter, the former auditor of the Atlanta & West Point Railroad, was recently convicted of embezzling the funds of the railroad company and sentenced to five years in the penitentiary, and on the 8th inst. was turned over to the brick company. Being an expert bookkeeper, he will be employed in the office of the brick company at the works. It isn't often that they have an expert accountant at that end of the business.

A MODERN MANUFACTURING PLANT.

—The H. W. Caldwell & Son Co.'s New Plant.—

CHICAGO HAS MANY great establishments of which she may well be very proud. One of the best among her manufacturing plants is the new works of H. W. Caldwell & Son Co., located on the West Side, or, more definitely speaking, on Western avenue, between Seventeenth and Eighteenth streets. It can be reached both by the surface trolley line and the elevated road in from twenty to thirty minutes from the downtown district. It will be time well spent for any one interested in mechanical methods and construction to visit this plant, for it is a revelation differing as much from the old time, illy lighted machine shops as does the up-to-date parlor car from the stage coach of early times.

If space permitted, we could write columns about this plant. As it is, we will give brief excerpts from a charming little booklet they have, entitled entitled

—"The Hanging of the Crane."—

The old-fashioned house-warming had for its principal ceremony the hanging of the crane, and the hanging of this indispensable piece of household furniture in the wide, old-fashioned fireplace marked the complete installation of the new household.

"Among the myriad homes of earth,
Like a new star just sprung to birth;
* * * * * *
And merry was the feast and long."

"In the economy of a modern machine shop, the electric crane, with its titanic strength, rapid action and saving of labor, is the strong right arm of the shop, and takes first place among the many efficient devices for the economical production of machinery."

The crane to which they allude is a traveling crane of the latest and best type of this most modern labor saving device. It is a three motor Pawling & Harnischfeger crane, with a span of 48 feet and a lifting capacity of 20 tons. Motors are arranged to move the crane lengthways of the building, and,

Machine Shop, Looking North. Offices in North end of Gallery.

if desired, to carry the carriage laterally while the lifting motor can be raising or lowering the load at the same time.

The crane is carried by tracks high above the level of the floor so that it can be used for receiving and delivering material from the galleries as well as from the main floor. A novel feature of construction in connection with the operation of this crane is a provision for receiving and delivering material direct from the cars on the tracks, outside of the building. The general practice has been to run a switch track directly into the building and under the crane. Instead of adopting this plan, a substantial steel structure extends beyond the south end of the building and over the switch track. The crane tracks are supported by this structure, and by an ingenious arrangement of the doors at the south end of the building the crane passes out of the building, pushing before it the end doors, and is thus enabled to receive its load directly from the cars. It is well worth a trip to the plant just to see the ease with which this great moving thing lifts and carries huge castings, etc.

The plant, as now completed, consists of three main build-

General View of New Plant.

ings: the power house, 56 feet by 73 feet; the main machine shop, 106 feet by 180 feet; the rolling mill and sheet metal department, 100 feet by 180 feet. The arrangement of these buildings with reference to each other is shown by the accompanying sketch of the ground plan. We also give two interior views of the main machine shop.

In the design of this building nothing has been spared to secure convenience of arrangement, facility in handling material, comfort for the men and abundance of light. The walls are of brick and the structural walls entirely of steel. In general design, the building consists of the main machine floor, with galleries on either side, these galleries being supported by heavy steel girders capable of sustaining any load that may be placed upon them.

The east gallery is occupied by the pattern shop, and that portion of the gallery occupying the front of the building is used for offices and drafting rooms. From these offices a view is afforded of the entire shop, and beneath the office, in front of the main floor, is the assembling and shipping room. While the west gallery is adapted for machine shop purposes, it will be used until the erection of their warehouse for the storage of their large stock of seamless steel elevator buckets, wood split pulleys, etc. In addition to the adaptability of the electric crane for lifting material from the main floor to the gallery, they have in the west gallery an Eaton & Prince electric elevator, with a platform 9 feet by 18 feet, adapted to take heavy loads of material of any size. The entire space between the galleries in the center of the building (48 feet wide) is kept clear of machines for use as an erecting floor, the tools being placed on both sides of this erecting space; the large tools, with special reference to receiving the heavy pieces of machinery delivered and taken away by the traveling crane.

—A Well Lighted Plant.—

By the liberal use of skylights and large windows, the machine shop is as well lighted as it is possible for any structure to be. An electric light plant provides illumination for night work, so that when occasion requires, they can run both night and day. Electricity plays an important part in

Machine Shop, Looking Southwest.

many divisions of the work and is generated in splendid dynamos driven by their own steam power.

One of the main buildings is devoted entirely to the manufacture of Caldwell Conveyors, of which they have made a specialty for many years, their Helicoid flight being generally regarded by the trade as the best of this type of conveyor. Those who are interested in improved methods of manufacturing should by all means visit this plant, if they can. If they cannot, the next best thing is to send for a copy of their descriptive booklet, in which will be found a full detailed account of each department and its equipment and a number of excellent illustrations.

HORNE FIRE THE SECOND.

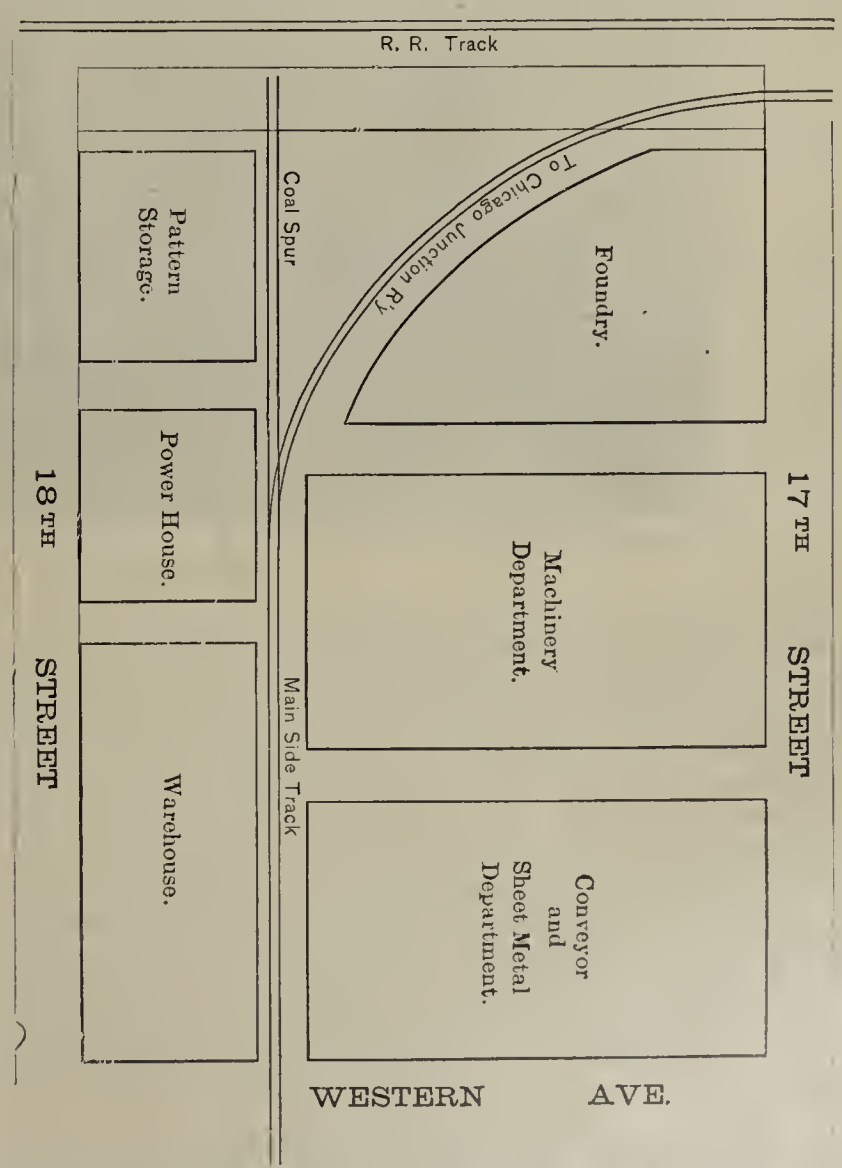
SOME ONE HAS SAID to us that burned clay fire proofing had quite a slam in the Joseph Horne & Company fire, which occurred on the 8th of April. We have been looking for facts from a reliable source. A report of a dependable character has just been handed out by Mr. F. J. T. Stewart to the Continental Insurance Company on the results of this fire.

Now, Horne & Company, be it remembered, had a fire in 1897. This was the first Horne fire and it created a great deal of comment, and it was supposed that the results of that fire would be educational. It is said that a burned child dreads the fire. Evidently Horne & Co. do not dread the fire. The same thing happened again that happened before, and under the same circumstances it will happen again. This building contained a department store. Now, some one says it is possible to make a department store fire proof. Why not? It is simply a question of the protection of the metal. The metal on a cupola furnace is not affected by the heat that is on the inside, which is equal to melting the pig iron, and the thickness of fire lining or fire brick is not very great.

We all know that 4-inch brick will protect a steel column or steel girders in an intense fire. This has been proved time and time again. It was proved in the New York Life fire in New York city a short time ago, and was proved in the Horne fire a few days ago. Many instances might be cited. Fire proofing any building or any structure, fire proofing a metal in a furnace, is simply a question of protection.

Standard burned clay fire proofing has received no slam in the Horne fire; nor is it to the discredit of the people who made the fire proofing in that structure. They are not responsible for the plan or scheme of fire proofing. The body of the blocks in no place suffered. Mr. Stewart in his report says the lower part of the girders are protected by tile blocks. The blocks under the lower flanges are fastened by sheet iron strips 1¾ inches wide and 1-16 of an inch thick, with no protection excepting that afforded by the plaster. These lower webs of tile scaled off. Of course they scaled off, nothing else could happen, for only a thin covering of plaster protected a metal which protected the beam and as soon as the metal was exposed it yielded, naturally the webbing dropped out and naturally the beam got very hot and then there was all kinds of trouble.

The fire proofing of the Horne building, as a matter of fact, was not hollow tile, was not burned clay, it was ⅝ of an inch plaster. There might have been burned clay 2 feet thick on each side of the beam or a girder, but what does that count for when a little strip of thin material is on the underside of the beam and is secured there by proper means. Is it the fault of the fire proofing or the men who made it that this fire proofing did not come down 4 inches below the beam and was not properly secured by the skew-back and the weight of the material between the beam? We think not. The people who did the fire proofing did exactly what they were paid for. They furnished what the plans and specifications called for; they were not consulted as to what the plans and specifications would demand. They probably did not give any good advice to



the architect or the owner of the building; if they had the architect or the owner would probably have said "go to —."

It may take one kind of fire proofing for a tombstone factory, but it certainly takes another kind for a roaring fire made by a department store stock. Many of the column surroundings failed. That was a proof that they were not heavy enough. Who said how heavy they should be? Not the peo-

ple who made the fire proofing; that was expressed in the plans and specifications. The people who furnished the material for fire proofing in this structure have done some of the best work of this kind in the world, and the fact that the material had been improperly used was not to their discredit nor to the discredit of hollow tile fire proofing.

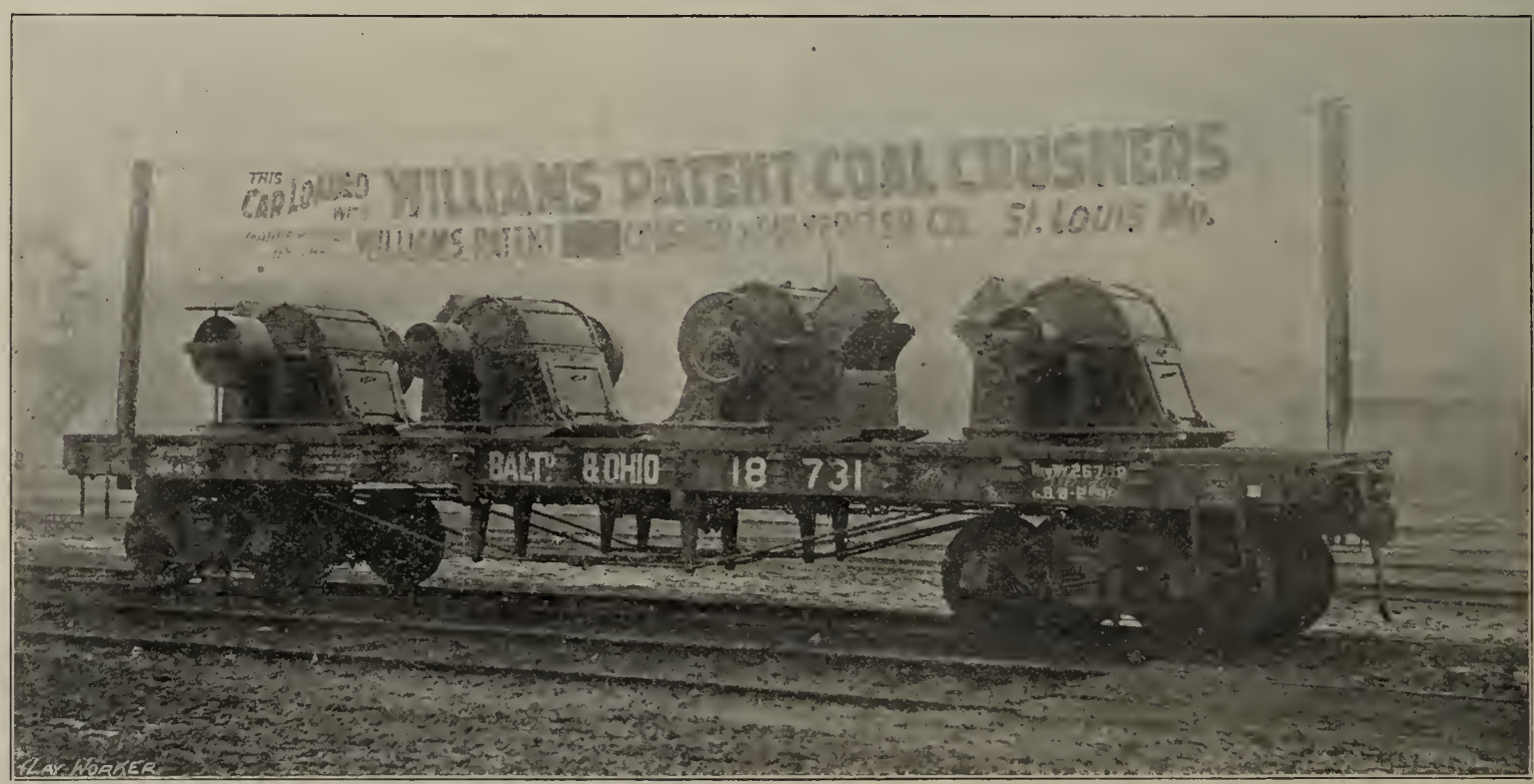
Some one has been trying to cover a large space with a small lump of money. We judge that it was the people who paid the bills who were responsible for this fire and its results.

"Experience is a dear teacher, but not a competent one." Experience rarely teaches anything. If each incident of life taught only a little, the millennium would long since have come. As it is it is far off in constructive methods.

L. H. GIBSON.

CLAY CRUSHERS AND PULVERIZERS THAT GRIND EXCEEDING FINE.

A visit to the factory of the Williams Patent Crusher & Pulverizer Company gave us ocular demonstration of the fact that that firm is getting its full share of prosperity. The factory has been enlarged, new appliances added, which largely increase the capacity and still they can only keep up with the demand for their pulverizers by the utmost effort. Mr. M. F. Williams, the founder of the business, believes in a strenuous life and is consequently happy, having enough depending upon him to keep ten ordinary men busy. His sanctum has recently been decorated with a number of photos of carload shipments of pulverizers and crushers, which of themselves tell a very pleasing story of demand and supply. We reproduce one of them, showing four coal crushers going to one plant. The Williams Pulverizers are adapted to almost any material or condition. Any of our readers who want to pulverize the earth or any part thereof will do well to first write to the Williams Patent Pulverizer & Crusher Co., of St. Louis, Mo.



A Car Load of William's Pulverizers.

The Duplex Heating & Machine Co., Ltd., New York city, manufacturers of the Newell Crusher, a cut of which is shown on page 489 of this issue, and which is in use on many brickyards throughout the country, recently removed their offices from 534 West Twenty-second St., to 85 Liberty St., Room 713, where they will be pleased to welcome any of the readers of The Clay-Worker who can make it convenient to call.

Written for the Clay-Worker.

THE BUILDING INTERESTS IN GREATER NEW YORK.

IT IS SAFE to say that the brick dealers of this great metropolis have never stood at the threshold of a spring season with more sanguine expectations of doing a big and a profitable business than they do to-day. They have had a good winter trade. They know it and are correspondingly thankful. There has been a slight dullness in between. They know that, too, and are not blaming anyone for it, but now they think the time has come for affairs to hustle, and the chances are that they will.

One of the reasons for their faith is the low price of brick, which may be had at from $5.50 to $6.25 per thousand afloat. If anything ought to stimulate trade, it is this, and yet there is another side to the picture. This is the high price asked for almost every kind of building material. Lumber may go down a little this spring, but not much, and as for iron there seems to be very little of it to be had.

Is building generally to be given a set-back this year because of the exorbitant figures? The question is a hard one to answer, and yet the trade generally believes that the solution has been found. They hold that the only thing that will be affected will be speculative building. The men who put up structures of a fairly cheap kind for the purpose of selling them again will have to be idle for a time. They do not dare pay the prevailing high prices for everything that goes into the composition of modern living or business structures, and the prevailing high rate of wages, and then expect to get what they ask of prospective buyers in their right senses.

But if the speculative builder is doomed to idleness, there are others who are not. The syndicates who are putting up skyscrapers for their own use, or for the use of others, have not been frightened off to any large extent, and quite a number of additions to present edifices in the downtown business districts and new structures up among the hotels are contemplated.

The front or face brick men are the ones who will benefit by most of these big operations, for there are few of the new buildings the specifications of which do not call for brick exteriors. Among the new buildings will be one for Adams & Co., a big department store on Sixth avenue, which will have a white semi-enameled brick front, something like

that which now graces Siegel-Cooper Company's big building almost directly opposite. The downtown Mutual Life Insurance Company building is to have a big addition, but its front is to be stone. The new Bishop building, at John and William streets, is to have a light gray brick front, while the exterior of the new Atlantic Mutual Life building and that of the Studio building, to go upon the site of the old Hotel Royal, have not been decided upon.

Talking of front or face brick, it must be observed that red brick are coming back to favor again. Somehow or other, the light brick craze has been overdone by some builders, and there is getting to be a revulsion of feeling in favor of more color. Still there is quite a demand for light grays, which match limestone excellently. Cream white and buff brick are holding their own well. It is asserted by some dealers that the reason why red is being used now in place of white and lighter brick is that the white brick is not well burned, and that after exposure it turns black and green, while the enameled brick is too shiny. Of course, the manufacturers of white brick deny this, and point to the many handsome structures all over this city to prove that no fault can reasonably be found with the product of their yards.

One of the most striking of the new buildings recently erected is the St. Laurence, at Broadway and Cedar street, put up by George A. Fuller Company, contractors. It is of cream white brick trimmed out in red. The red is in the segments of the arches over the windows and is just enough to relieve the dead monotint. Surely not more than 5,000 red brick have been used, while the cream white is from the yards of the Powhattan Clay Manufacturing Company, whose offices are at 1123 Broadway.

The following is the annual report of the Department of Buildings for 1899:

	No. of Buildings.	Cost.
Dwelling houses over $50,000	40	$2,910,500
Dwelling houses between $20,000 and $50,000	144	3,714,000
Dwelling houses less than $20,000	1,222	8,202,307
Flat houses, cost over $15,000	2,149	72,673,000
Tenement houses less than $15,000	963	.....
Hotels and boarding houses	35	2,806,800
Stores over $30,000	83	15,062,000
Stores over $15,000	19	422,000
Stores less than $15,000	115	452,995
Office buildings	47	10,789,865
Manufactories and workshops	256	5,955,420
Schoolhouses	42	4,123,500
Churches	22	463,700
Public buildings, municipal	14	1,278,500
Public buildings, places of amusement	40	2,990,496
Stables	200	1,226,107
Frame dwellings	3,754	10,936,914
Frame tenements and other structures	1,834	4,766,798
—Location.—		
In Manhattan and the Bronx	4,934	$129,250,376
In Brooklyn	4,627	23,248,839
In Queens and Richmond	1,418	4,344,106
Total	6,414	$156,843,321

New buildings in progress on Dec. 31 were 6,535.

The total of plans for alterations during the year was $10,149,107, making a total for the new buildings and alterations of $167,618,664, against $99,227,824 in 1898.

James R. Sayre, president of the Sayre-Fisher Company, is expected home from the South this week. Peter Fisher, who has been spending a short vacation at the Ponce De Leon, Palm Beach, Fla., has also returned North.

Pfotenhauer & Nesbit are kept extremely busy with large contracts.

A recent incorporation is that of the William Maginnis Company, of Saugerties, N. Y., to manufacture brick; capital, $30,000. Directors, John C. Maginnis, Catherine M. Montgomery and Martha P. Maginnis, Glasco. BRIC-A-BRAC.

Written for THE CLAY-WORKER.

CAPITAL NEWS.

WHILE ON A RECENT NEWS quest your correspondent called upon Mr. C. B. Pearson, the new secretary of the Standard Brick Company, who takes the place of the late Mr. West, who died last March. From information obtained am glad to say that the brick manufacturing business is is in full swing, everybody employed, with prospects for the season very fine.

The Standard Brick Company still continues to sell the product of nearly all the machine brickmakers here, and this season's output will foot up a large sum of money for the (about) 100,000,000 brick that will be required. Last year the number produced was about 70,000,000. The increase in price will be 12 per cent. in all grades of brick, but this is offset by the increase of 10 per cent. in laborers' wages and the raise in the price of coal. But taking all things into consideration the Washington brickyard owners have good reason to be satisfied with the business outlook.

There is a notable increase in real estate operations, and sales of smaller-sized houses are frequent. One of the big transactions made recently was the sale of 19 1-3 acres of the historic Chase property, situated just outside the city's northeast limit. The sum paid was $67,000, the purchase embracing the fine old brick mansion, where once lived Chief Justice Salmon P. Chase, and where his daughter, the late Kate Chase Sprague, lived for years with her daughters amidst beautiful natural surroundings, while inside the house there was a wealth of artistic adornment, bric-a-brac, etc. The mansion—which will be added to or supplanted by an orphan asylum—sits upon quite an eminence, commanding a splendid view of the city, where its famous owner took such a prominent part in government affairs, and where the beautiful daughter reigned as a social queen.

The new orphan asylum will take a great many brick, as will another building enterprise (in the city) which also takes the place of an historic landmark. This new structure is to be a six-story business block of light colored brick, Indiana limestone and terra cotta trimming, and will be situated at the northwest corner of Seventh and D streets. The old structure that will disappear was the home of the National Intelligencer, one of the earliest of Washington's papers, one that had the misfortune of having its type thrown out of the window by British soldiers when they invaded this city during the war of 1812-1814.

Two quite important building projects—a large business building and an apartment house—which were to have been carried out in the interest of former Senator Clark, it is possible, will fail on account of the adverse decision of the Senate in the matter of allowing Mr. Clark to retain his seat. So a part of this millionaire's wealth may not assist in enriching and beautifying the capital city.

It is a fortunate city that can interest in a business way such a vastly rich man as this modern Croesus, whose income is something like $30,000 per day. He has been occupying as a residence here a considerable part of the Arlington Hotel, contained in the annex known as the Webster House, where Daniel Webster lived while serving the government. It is said that Mr. Clark paid the hotel $4,000 per month. With so much "filthy lucre" one could turn the golden sands of Cape Nome into brick and build an Aladdin's palace. The "golden sand" of Washington, upon which the business structure mentioned here in the Clark connection, is worth about $46 per square foot. And, on the average, I expect that beats Cape Nome.

Notwithstanding the high price of material large and small building enterprises will be pushed along in greater number than usual. Money is plentiful, on easy terms, and this city

is considered a good place for property investments. The brickmaker here will reap quite a golden harvest from government work, an important item in income, which contributes to prosperity more or less every year.

A most interesting and valuable addition to Washington's structural wealth, the new library building donated by Mr. Andrew Carnegie, will be begun in a few weeks. This will occupy a part of Mount Vernon Square, and when completed, in February, 1902, according to contract stipulations, will make a very ornamental feature in its location, where the surroundings are not by any means artistic or aristocratic. The inner structural work of the library will be principally of steel; other material used will be Indiana limestone, granite, marble, vitrified tile, white oak and Georgia pine. Among the attractive features will be tile and mosaic floors and the main entrance doors, of bronze. NICODEMUS.

A HAND POWER BRICK PRESS.

We are pleased to show a cut of the Grath Improved Hand Power Press, as will be seen. This press is very complete in every respect, and is furnished both with charger and without. This press is guaranteed to be absolutely unbreakable, the weight of same being 1,300 pounds, made of the best quality of iron and steel. In making plain press brick, two men can make 2,000 per day; in making ornamental brick, about 1,200. The Illinois Supply & Construction Co. will guarantee that the brick produced on this press are equal to those made on any steam press on the market, and free from granulation, and have perfect edges and corners. No brickyard is complete without a press of this sort, as all the different ornamental brick can be made on same, ranging in size up to 12¾ inches long, 7½ inches wide, and any thickness from 1 inch to 3 inches. The brick made on this press are uniform in thickness, which is a great improvement over the screw process. This press is fully guaranteed in every respect.

The Illinois Supply & Construction Co. also build a model, which is ¼ size, for making sample brick, which are made 2⅛ inches long, 1 1-16 inches wide, and from ½ to ¾ inch in thickness. These are sold to brickyards and enable the manufacturers to make small samples, which are sent out by mail, in place of sending out full size brick by express. The expressage saved in this manner will pay for the press in a short time. At the same time this model can be used for testing different clays, which is a great convenience.

For catalogue and further information apply to the Illinois Supply & Construction Co., Century Building, St. Louis, Mo.

A REMARKABLE BRICKYARD ACCIDENT.

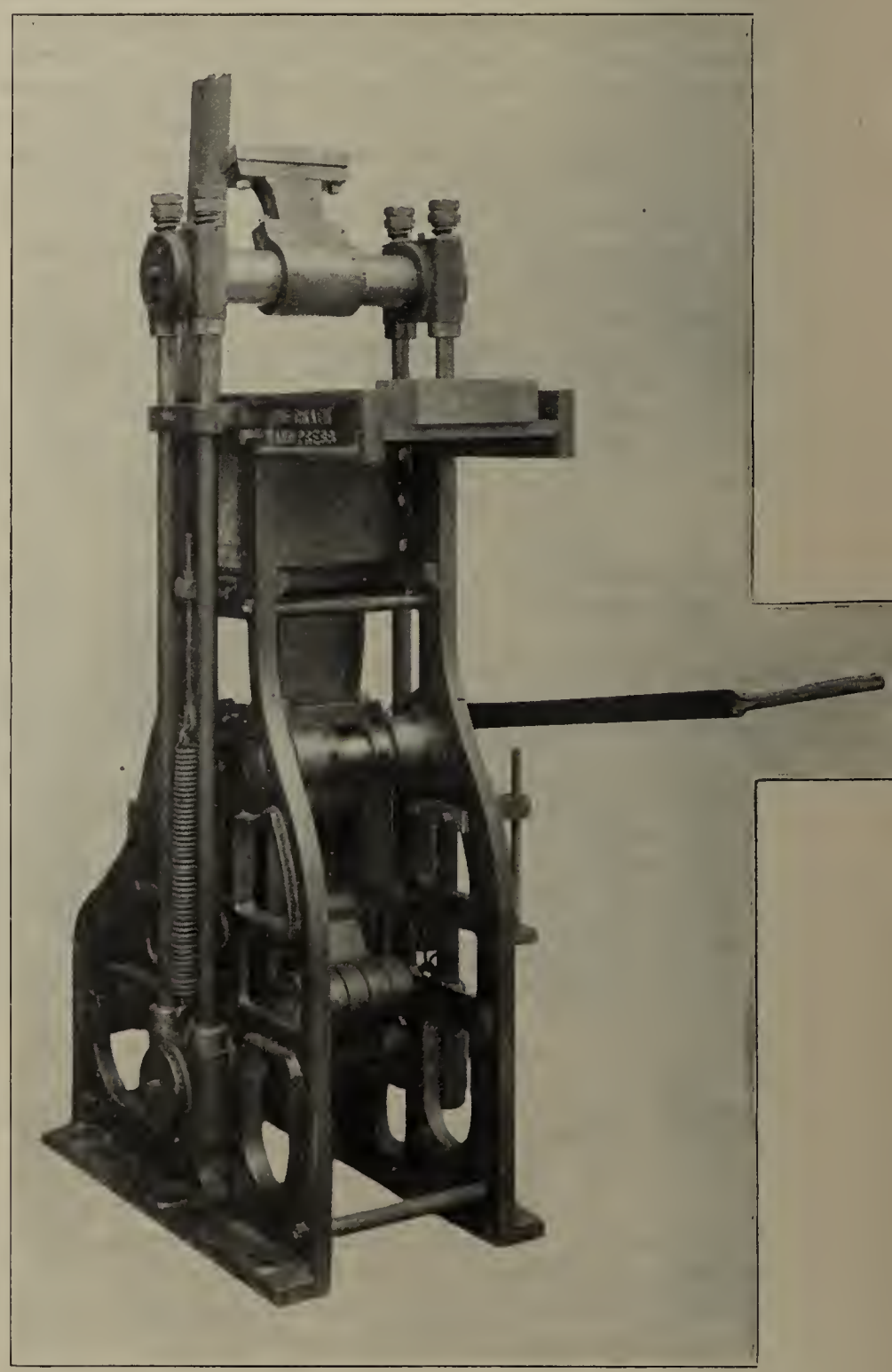
A serious, perhaps a fatal, accident occurred near Statesboro, Ga., May 2. Mitchel & Scarboro, in addition to their saw mill, have recently purchased a brick machine to be run by the same engine. They had just got their machine ready for operation, and molded a few brick to try it. J. A. Scarboro, one of the proprietors, noticed some straw and fine roots on some of the blades, and had let himself down in the hopper for the purpose of cleaning them off. Mr. Mitchel, not knowing Scarboro was in the mill, started the machinery. In an instant he heard the cry of the man, and stopped the mill, but too late. One of Mr. Scarboro's legs had been broken in two places; one of the blades had cut the foot of the other leg half in two, besides bruising him otherwise.

The hopper had to be torn to pieces to extricate the unfortunate man. A telephone message was sent for a special train and physicians, when Drs. Samples and McLean responded. It is not yet known whether the broken limb will have to be amputated or not. Rev. J. A. Scarboro is an eminent divine, and is one of the best known Baptist preachers in the State, and his innumerable friends will be pained to hear of his sad misfortune.

THE MIS-SENT LETTERS.

There are over half a million letters a month sent to the dead letter office, all of which can not be laid to the carelessness of the sender. In many cases people who regularly receive mail move without leaving address for forwarding. This not only puts the sender to unnecessary expense, but also causes the postal authorities no end of annoyance and inconvenience. Some day some thoughtful congressman may cause a law to be passed which will subject one to a heavy fine who moves without leaving with the proper postal authorities his change of address.

Of the mail matter sent to the dead letter office over 2 per cent. of it has insufficient postage, 5 per cent. is misdirected, and about 5 per cent. has no address whatever. And then about 20 per cent. has been sent to hotels, where it is unclaimed. There's another man that ought to get six months in jail occasionally—the man that leaves no address for forwarding with the hotel. He, too, is putting all parties to unnecessary expense and trouble.



Grath's Improved Hand Power Brick Press.

Many letters containing money reach the dead letter department from some of the aforementioned causes, and drafts and remittances to the amount of almost a million dollars were mis-sent last year.—Ex.

Written for The Clay-Worker.

DEFECTS OF GLAZES.

O ONE WHO HAS RECOUNTED time and again the almost endless number of defects to which glazes are heir, it is not strange that he should be seen gazing with wonder and admiration at the exhibits which museums afford of various specimens—many, though, crude—of what was accomplished centuries ago, and of brick and earthenware which are claimed to have been made a few thousand years ago, and one finds himself lost in thought as he attempts in his own mind to unravel the manner in which the seemingly mysterious and beautiful glaze effects were produced, and particularly is this true of some of the later day achievements. To him who has produced an occasional freak specimen the explanation of certain phenomena attending the glaze resulting from the treatment to which the particular ware has been subjected indeed often proves a very perplexing problem and ofttimes requires much arduous labor to probe to the bottom of the real cause. No one more fully appreciates the troubles which the question of glazes involves than do those who almost daily are confronted by new problems due to a change of conditions in some part of the manipulation, or a change of materials varying in composition to those previously used, either in the glaze or enamel, or perhaps due to a difference in the composition of the body, owing to a change of some of the ingredients.

To enumerate in general the defects to which glazes are heir is not a difficult matter, for, generally speaking, we think of glazes as defective mainly in regard to crazing and shivering—purely a matter of difference of coefficient of expansion between the body and glaze, which, in most cases, with suitable and properly fired biscuit, is capable of adjustment by attaining the proper acidity of the glaze. If the body and glaze tend to expand and contract at an unequal rate for each degree of rise and fall of temperature a rupture is bound to ensue if these conditions are carried far enough, and either shivering or crazing will be produced according to which has the greater coefficient of expansion.

The simplest kind of a glaze is, perhaps, the salt glaze, which is the only one used by sewer pipe manufacturers, and very largely used by the stoneware potter. The manner of glazing consists mainly of throwing salt on the fires just previous to finishing a kiln, which results in a chemical decomposition, the elements composing the salt—sodium and chlorine—breaking up the heat, the sodium reuniting with the silica of the clay as it is carried into the kiln proper by the gases and comes in direct contact with the ware in its passage through the kiln, forming silicate of soda, which constitutes a glaze of the simplest type. If the salting is carried on properly the defects which the ware would be likely to show could be traced mainly to the body. No attempt to outline the kind of a clay best suited for the manufacture of this kind of ware is here considered more than it has to do with the glaze. In the manufacture of ware of this kind the clay must bear certain requisites to make it most suitable to taking a glaze well. The proportion of the silica to the alumina must lie within certain limits to obtain the most satisfactory results, and should be such that the body will take a clear salt glaze. When deduced to a formula the typical stoneware clay looks about as follows:

$$\left.\begin{matrix}.56\ \text{Alkalies}\\ .44\ \text{CaO}\end{matrix}\right\}\left.\begin{matrix}.525\ Al_2O_3\\ .150\ Fe_2O_3\end{matrix}\right\}25\ SiO_2$$

The formula below is given by Seger as the most fusible porcelain mixture, and is taken as the basis on which the Seger cone series are founded:

$$\left.\begin{matrix}.3\ K_2O\\ .7\ CaO\end{matrix}\right\}.5\ Al_2O_3\ 4\ SiO_2$$

The best salt glaze has about the following formula, which, by comparison, we find corresponds very nearly to the one above:

$$1\ Na_2O\ .5\ Al_2O_3\ 4\ SiO_2$$

That is, the most satisfactory results are obtained if the proportion of alumina to silica is in the ratio of 1 to 8. Where there is not enough free silica, and the composition of the clay varies too greatly from the proportions named and does not take a salt glaze well, we find on trials drawn immediately after the salting process a glaze which meets our approval, though only fairly well, but still looks promising; but, once the kiln is cooled and the ware drawn, we discover that, instead of bright glazed pieces, dull looking ones confront us, with scarcely a trace of what might be called even a semi-glaze. This is due to no fault of the burner. We must look to the clay for the trouble. Clays high in iron pyrites and more particularly in sulphate of lime most often prove troublesome members, and from the presence of the nodules of calcium sulphate may be traced certain other defects. Where these nodules, though reduced in size by the dry pan, come to the surface they fail to take the glaze well, and there appear defects on the surface centered about these spots in consequence.

With the white ware potter or a potter using a standard body and in many cases a standard transparent, colorless glaze, where the question of color decoration does not come into effect, the troubles which arise from defects attributed to the glaze are comparatively few. This is equally true, and applies more emphatically to the red ware manufacturer or to the manufacturer of roofing tile, where the greater per cent. of the glaze is composed of lead in one form or another.

With the manufacturer of mantel tiles and the under glaze decorative art potter, whose object is chiefly to impart great brilliancy and richness to the glaze and to bring out bright, rich color effects, the troubles which are here encountered are of a different nature. Here we have a properly prepared body which has been lawned through a fine mesh and freed of all objectionable matter. The defects commonly encountered are shivering, crazing, bubbling and difficulties arising from too fluid a glaze, causing flowing of colors and other irregularities.

With the manufacture of enameled brick which are burned in an open kiln we meet attending obstacles which are not encountered in making a pottery article, which we place in a sagger and carefully lute the same to exclude the kiln gases and drafts. Here with certain glazes we meet the defect of "crawling," as commonly termed, as well as many others. But time and space will not permit an attempt to discuss these defects in detail and point out their causes and remedies.

In the handling and glazing of bath tubs and of various sized and shaped peices weighing several hundred pounds, where the glaze is applied to the green body and the finished produce undergoes but a single firing, many difficulties arise, as might be imagined, which are not encountered in the manufacture of a teacup and saucer or a small vase. And so mention might be made of the various industries using glazes, and, after having given a rough resume of the defects incident to each individual branch of ceramic manufacture, it really would convey but little to any but to him which has been in the harness and wrestled with these problems and their remedies.

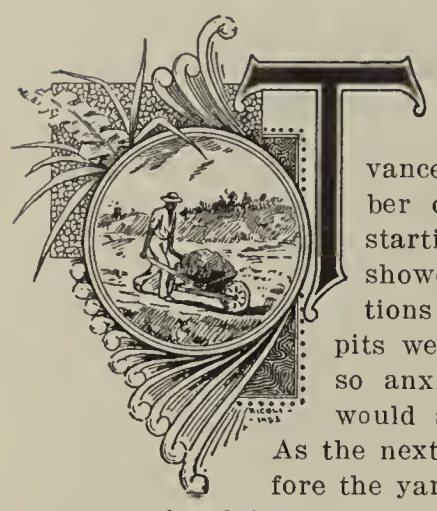
E. E. GORTON.

A CHANGE OF BASE.

W. R. Cunningham, who for several years past has been secretary and manager of the Wallace Mfg. Co., Frankfort, Ind., has severed his connection with that company and taken the superintendency of the Bucyrus works of the American Clayworking Machinery Co. Henceforth his home will be in Bucyrus. He takes with him the hearty well wishes of all with whom he has been connected. His skill and ability as a mechanic, and his thorough knowledge of the brick and tile business, will make him a very valuable addition to the American's already large force of trained experts. Both the company and Mr. Cunningham are to be congratulated on their alliance, which will undoubtedly prove of great mutual advantage.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.



THE MANUFACTURE OF BRICK for the season of 1900 is fairly under way. In fact, it is so far advanced that several yards have a number of arches up, and others are just starting their first arch, with April showers causing them to cease operations for several days. As usual, the first pits were washed. The bosses are usually so anxious to get to making that they would start in March if it were possible. As the next best thing they begin in April, before the yards are dry enough, with always an excuse for doing so.

Of late years the cry is that the men will go to other yards and the local yards will not be able to get help. I firmly believe there are some in the trade who, if it were made as plain as possible—in fact, stated positively—that if a wheel was not turned until June 1 the price of brick would be advanced $1 per thousand, would start in April just the same, with the hope that springs eternal in the brickmaker's breast that he would be all right—and he would be ahead of the rest.

—Lost, Strayed or Stolen,—

A building boom that was to materialize in the summer of 1900 in the cities of New York and Brooklyn. If such is in sight it will require a more powerful telescope than now exists to discover any indications, to say nothing of the wonderful prosperity that was launched last year. Figures are dry to most people, but to the brickmaker they indicate money—profit or loss in the business. With the cold figures of the Department of Buildings in the boroughs of Manhattan and Bronx, or New York city proper, the brickmakers are face to face with conditions that are not pleasing. The number of permits from the 1st of January to the 20th of April is enough to cause one to say there must be a mistake. To prove that it is a stubborn fact, the demand is light. One need only note the number of barges that supplied the market for the week ending April 20 to know that no mistake was made. Some say the reason of the lull is that the buildings started last year are just about to be turned over to the owners. They say that new contracts are ready and cellars will soon be excavated and foundations laid, and that then the demand will be more active. Admitting that this is true, how long will it be before it will help the market, if it ever does?

—What to Expect.—

In the borough of Manhattan the number of building permits issued from Jan. 1 to April 19, 1900, was 288, while for the same period in 1899 there were 864 permits issued. In the borough of Bronx, from Jan. 1 to April 19, 1900, there were 206 permits, as compared with 718 in the same length of time in 1899. Just think, 1,088 more buildings projected in three months and nineteen days of last year than in the same length of time of the present year! The first of the year is always the season in which the largest number of permits is issued. Of course, some that did not build last year may do so this year, and many who have permits for the present year may not use them, so that conditions will remain about the same.

The cost of the projected buildings of this season so far filed shows the following: Borough of Manhattan, $14,969,405; borough of Bronx, $1,793,226; for same period last year, borough of Manhattan, $32,198,429; borough of Bronx, $7,055,928. As will be seen, the difference in cost is $22,490,932.

—Another Straw.—

From April 1 to 19 there were thirty-four barges remaining on the market from the previous week. In that same week there were only about 8,000,000 brick sold, a small number to be disposed of, as all of the barges did not go alongside the dock in New York city, but Jersey City, Brooklyn and possibly the outside market took some. The prevailing price now is $5, $5.25, $5.12½ and $4.72.

Many opinions have been expressed as to the cause of the slump in building operations. Prosperity in all lines has been talked of, and politicians have made the most of it. Each one has his own theory as to the reason, and each section of the trade claims that it is not caused by the excessive high price of the material in which they deal. The brickmaker has certainly not had a fancy price for his material. The metropolitan papers, as well as the local papers, have for some months back set before their readers the high price of building material, expressing the opinion that it would somewhat retard building operations. On what grounds they have based their opinions none but themselves know, as facts prove that when all things are high in price then the boom is in evidence.

In 1898 real estate and all building material was low. Last year the advance was in full swing, and, although more brick were put on the market than for several previous years, the amount of stock on hand at the close of navigation was but a few millions more than the year before. As the price of brick during the past winter was but $5.75, the brickmaker can truly say he was not the cause of the slump. But if good weather prevails, he will probably be a factor in the slump of prices of brick very early in the season.

Iron is considered the central point in all building operations. When it flourishes all lines enjoy an improved business. Judging from the decided reduction per ton during the past week or two, all is not gold that glitters—in that direction, at least. It seems hard to believe that overproduction could have been the cause of the reduction, as month after month the report was given out that the mills were overrun with orders and were thousands of tons behind, and then, without warning, a slump in that material was given out. Is there an overproduction in new buildings that has caused such a falling off in that line? Presume we will soon hear that lumber has the call for lower prices.

Or can it be that the fact that this is presidential year is affecting the two lines of trade? If so, it has made the falling off of building permits in New York city quite marked.

—The Outlook—

Is rather discouraging, whichever way one looks. I will quote from a letter of one who is well qualified to judge and is in close touch with the market. The letter appeared in the local papers, and I trust if the gentleman referred to should see these lines he will overlook the liberty I have taken:

"Taking the outlook for the season, from first to last, it is perhaps the least encouraging we have seen for ten years. An early start will surely mean lower prices than last season."

These words appeared in a paper published in the largest common-brick manufacturing center in the country, on the 19th of April, and at the same time several yards were busy turning out brick and others getting ready to start. If there should possibly be a strike of any proportions in the building trade, so that consumption would be restricted to any extent, the price would soon go below the cost of production. As a fact, the 1st of May is still several days off, and the price is fast traveling toward that point.

—Restricted Shipments—

Should be looked for at this early date, especially when from week to week the price is falling, but the opposite is the case, as the past two weeks show. One week thirty-four barges were on the market and thirty-four came in. The next week thirty-five were on the market and fifty-five came in, or an increase of twenty-one barges, no doubt caused by the fall in rates. Just as soon as the yards get up a small kiln they burn and ship till the price gets so low that some—I will not say all—will hold back till they see there is not to be a reaction, then all will be in at the death of prices for the summer of 1900.

Experimenting will not be indulged in to the extent it was last year, but more solid results will have to be aimed for than was the case a year ago. Coal will be used, but I think, as a rule, better results will prevail than did last year. If not, there will be a number of flat pocketbooks at the end of the season. However, there will be quite as many yards using wood as there will be using coal.

—The Market—

Will be classed as a buyer's market in all respects, as he can take his pick from any grade he may wish, as there is a full supply on hand at the dock for the most fastidious buyer to choose from, and when that condition is reached the buyer is like a young man buying a present for his best girl—the best is not good enough; he generally wants a chromo thrown in. In the buyer's case this means a reduction in the price asked. You can judge for yourself whether he gets it.

Week ending April 19, Haverstraws, $5@5.25; Up Rivers, $4.87@5.12½.

Week ending April 26, Haverstraws, $4.75@5.00; Up Rivers, $4.50@4.75.

The reduction in one week of from 25 to 37½ cents per thousand would, on a cargo of 250,000, buy a very nice chromo. Do you not think so, too, Mr. Editor? A. N. OLDTIMER.

Hackensack, N. J., May 1, 1900.

Mention THE CLAY-WORKER.

When writing to Advertisers,

Mention THE CLAY-WORKER.

BOSTON BAKED BRICK.

Ruminations of a Native Hubite on the Glories of Early Boston Brick Architecture.

ANENT some late utterances of ours on the bricks back of the Boston Public Library; we feel that we owe an indirect apology to Boston for our apparent desecration of her time-honored worship of baked clay. For, side by side with that love of culture, and a general upholding of whatever is manifestly good and great, which have ever characterized the Boston mind, there would seem to live also in the soul of our aboriginal Bostonian a deep-rooted belief in bricks.

The late Thomas Gold Appleton, who was in his time probably our best critic, and certainly our most kindly and generous one, ought to have been well versed in the tenets of ancient Boston. And he held some strong views on bricks. The writer and others have heard him hold forth in conversation much as follows:

"We good Bostonians know every little crack and peculiarity in these dear old bricks of our Beacon street. And, although it may be a weakness, I must admit that to get a sight of them again is a strong magnet in drawing us back across the water, and away from more congenial climes and people. I, for one, feel that I have been unable to give myself any other reason for having returned here again and again. After I have got back, looked well at the bricks, and ascertained beyond a doubt that each individual one is still in its old place, a feeling of satiety soon sets in, and I begin to ask myself why I was such a fool as to come back to Boston. And, being unable to give myself any rational answer, I generally depart as unexpectedly as I have come. And this I do, only to repeat the same experience again and again. I feel sure it is really the bricks in our Boston that are the true loadstone that draws us all home, while the climate and the people drive us away again, although many Bostonians may not admit this truth even to themselves."

But this unconquerable passion for bricks prevailed in the old days when the sacred precincts of Beacon street were as yet undesecrated by the influx of the Jew, the Armenian and Turk, the butcher, the baker, the ladies' tailor, and the curio pro curator, and the florist, the tourist, the peerist, and the poorest (mixtures in architecture and people).

It was in this reign of bricks, so to speak, that we could none of us walk in this exclusive part of town (a kind of charmed semicircle embracing three sides of the Common, and extending down Park and along Sumner and back from Park, through Mt. Vernon street and through the many little streets branching therefrom and bearing the names of different trees) without running up against our uncles, our cousins and our aunts. The charmed district extended from the very beginning of Beacon street to its utmost limits, which were then far short of two miles, a walk to what is now the Charlesgate, and beyond toward the Brighton road, being then the milldam, and a favorite walk of fashion, especially of a Sunday afternoon. On these occasions society when out after church for an airing migrated upon the plank walk of the milldam which led "out of town" and left the classic bricks of Beacon street in the far distance. It was then hardly an exaggeration to say that one knew every one of the people, as well as the bricks, that one met.

These were the good old days in which when the wind was due east (for at that time it blew with unchecked coldness over the isolated precincts of Beacon hill) many a good man and true, aye, and woman also, has been known to cross the street rather than undergo the humiliation of seeming to give in to the pressure of the atmosphere by unbending to the extent of recognizing his or her dearest friend. It was in those days, too, that people, growing tired of contemplating the same bricks, and wearying somewhat also of the cast iron guidance, in even the most trivial of their affairs, of their dear but puritanical minded friends and relatives, betook themselves to the lunatic asylum to get a rest—that is, when they could not get away to Paris or Rome. Sometimes they chose Somerville in perference to Paris, thinking perhaps there was little difference in the inhabitants of both places; while at Somerville besides they were sure to find friends of their own social standing, and, what was best of all, a different set of bricks. So that, when they returned to the same old bricks and friends they had left behind, they were as glad to see them again as though they had had all the fatigue and expense of a trip to Europe and back. Thus, at that era, when any persons were missing from the Beacon hill district, it was generally understood that they had gone either to Europe or Somerville for change, and no especial anxiety was felt; for it was well known that a yearning to contemplate the same old bricks and gravestones of smaller Boston would eventually draw them back to their homes, and that they would not break loose from the inexpansive affection and dyspeptic harmony that characterized many of these domestic interiors until these attractions and the above named outside ones had again begun to pall upon them, and driven them stark, staring mad, or hounded them three thousand miles eastward into space.

But, with all the littlenesses of smaller Boston, these were the days, so to speak, of harmony in bricks. Let us not despise them. Who that lived in this brick period can forget the homelike, dignified and often handsome brick dwelling houses in Park and Tremont streets, and ranging thence through Winter into dear old Summer street, where the stony gloom of old Trinity (all in rough dark-gray stone, and a consistent minor note in the midst of the major tones of red clay) was so delightfully relieved by the rows of pretty dwelling houses just beyond, with their little front gardens? There chestnut trees spread their outstretched branches over the sunny sidewalk, and lilies of the valley grew in the shady flower beds inside the iron fences. Who that remembers old Summer street as it was before the monstrous Boston fire combined with the giant oncoming of the wholesale trade to sweep away this whole district, leaving not a trace of it save in memory)—who that remembers sunny old Summer street can fail to see in memory the dear old church at the bend half a mile from old Trinity, and the grand old tree in its yard stretching its green banners so bountifully above the passer-by, while the clock in its spire seemed to wish to show everybody at both ends of the road that time and religion held charm and happiness instead of gloom for mankind.

This was before the onward march of the retail trade, the vanguard of the wholesale, had swept out the brick dwelling houses along Tremont street and quiet streets branching therefrom, and planted its towering and vulgar vagaries in the place of tranquil harmony. In those days of harmony in brick, stone and brick, and even wood and that substance, were often combined in a dignified and pleasing manner.

As one of the best examples of marble being used with brick, we would recall to memory the house of the late Dr. Lyman, on Tremont street, which the ugly and aggressive retail shop has long since crowded off the turfed and roomy corner where it stood, some fifteen feet back from the public way, the greed of trade having long since seized every inch of the grassy ground, edging its inroads to the very sidewalk. Another happy example of wood and brick harmoniously combined in architecture were the old Austin house on Beacon street, which, thank heaven! still lives with us, and, alas, that delightful old house at the corner of Park and Beacon streets, with its lovely sunken garden and colonial columns to its porch——alas that anything of it remains to make more emphatically ghastly the horrid trade combination and costly but incongruous additions to its own simple and pleasing architecture. The pretty little sunken gardens are now paved entrances to basement shops.

In looking on this and other shocking and vulgar rehashes of Boston's old architecture, one feels tempted to weep for the loss of the good taste that prevailed in the brick era—were it not that, as one walks along Beacon street nowadays, one is aroused from a tendency to idle tears to a state of impotent anger, as he comes upon one solid sky-scraper after another, representing so much consolidated money, and utilized space to the utmost square inch. For, where the rehash has brought in merely moneyed mutilation and discord, the sky-scraper has implanted annihilation. Indeed of the old brick reign in its simplicity, a few of its comely houses, with their inseparable little front gardens, remain only in Mt. Vernon street and thereabouts to tell the tale of quiet good taste long departed.—Aaron in Time and Hour.

Sayings Wise and Otherwise.

When you have nothing to say—say it.

Always live within your income—if it is large enough. If it is not, increase it.

A fool and his folly are inseparable acquaintances.

After most apparent failures there still remains the power of effort, showing that he succeeds who plunges on again.

There is no disease which so racks and weakens ability, intellectuality and the manhood as that commonly known as "swelled head."

Learning is such a strange thing. The more knowledge one obtains the greater grows the realization of his ignorance. —G. E. C., Jr., in Fame.

SMOKE CONSUMPTION AND ECONOMY OF FUEL.

INDUSTRIAL economists in Germany are just now greatly interested in the development of an invention which promises to solve more effectively than has been done hitherto the problem of consuming bituminous coal, slack, sawdust, and other inferior forms of fuel, without smoke and under conditions of extreme economy.

The process consists simply in distributing heated and slightly compressed air through hollow grate bars to the whole lower surface of the furnace, which, being injected upward through the mass of burning fuel, secures equal and perfect combustion, and an intense, regular heat from materials that would not be available if burned by ordinary methods. This system has been in practical use since September last at the works of Messrs. Reissner, Wahl & Co., manufacturers of cloth at Guben, and since December last at a large hotel in Berlin, where a steam engine, supplied by two boilers, is kept in service to drive a dynamo that generates electric current for lighting purposes, elevator, etc.

In view of the extraordinary interest which attaches to this subject, and its prospective importance in abating the smoke nuisance in cities, and bringing into use vast quantities of material which are now practically worthless, a visit has been paid to the installation in Berlin, and this is what was there exhibited:

The two boilers are of the ordinary flue pattern, placed side by side, and their furnaces separated by a dividing wall, so that one can be thrown out of use or turned on as occasion may require. The furnaces are about 10 by 4 feet in area, and the smoke passes by subterranean flues to a stack chimney standing in a central court and rising above the roof of the building. Near the furnaces is located an ordinary fan blower, driven by an electrical motor of one-half horse power, the speed of which is easily controlled, and which drives the air through a six-inch pipe into a hollow iron chamber about ten inches deep, which forms the front section of the hearth of the furnace. Into this air chamber is fitted one end of the hollow grate bars, which are about two and one-half inches in diameter, extend backward the length of the furnace, and are supported by ordinary bearings at the farther end. These hollow grate bars are round on the bottom, but at the top are hexagonal, presenting three faces, each pierced with holes about two inches apart and beginning with a caliber of one-eighth inch, which increases slightly throughout the length of the bar, to equalize the discharge of air from the gradually decreasing pressure within. The hollow grate bars are laid about six inches apart, and there is placed between each pair three solid triangular bars, which assist in sustaining the weight of the burning fuel. The air being forced by the fan blower into the hollow chamber, is there heated from the fire on its upper surface, then passes into the hollow grate bars and is injected upward in three rows of jets, one vertical and two inclined to right and left, so that the entire under surface of the burning mass resting on the grate is fed constantly by jets of fresh heated air, which generate from the most ordinary grades of fuel an intense white heat, which can be perfectly controlled by regulating the speed of the fan blower, and produce a combustion so natural and perfect that the smoke is entirely consumed.

At the time of the visit the fuel in use was what is known as "coaksgries," or coke dust, the fine slack that comes from screening gas coke, the scrapings of retorts, etc., which has hitherto been regarded as worthless except for ballasting roads and footpaths. The bed of burning fuel was maintained over the surface of the grate about five inches deep, and the fire was white, intense and evenly distributed. The air current being stopped, the fire at once dropped to a reddish tinge and began to smoke.

The original invention contemplated reinforcing the combustion by impregnating the injected air with a small proportion of cheap oil gas, but experience soon taught that pure heated air was quite sufficient, and, further, that the air chamber, instead of being located at the front end of the furnace, should be at the rear or farther end from the door, where the heat is most intense and whence the current in the grate bars is injected forward—that is, in a direction opposite to the draft of the furnace itself. The hollow grate bars are of cast iron, made in sections about three feet in length, with pierced flanges, which enabled them to be bolted together at the ends, so that the bar may be lengthened to fit any furnace. Being protected by the current of air, the bars are practically indestructible by fire, those in use since September being still in good condition.

With an apparatus so simple and natural in principle as this, some surprising results have been already obtained, although the practical application of the process is in its infancy. The proprietor of the hotel, who has had the apparatus in use since December, gives it the highest approval, stating deliberately in his certificate that it has reduced by three-fourths his outlay for fuel, worked with efficiency at all times, and completely eliminated the smoke and soot, which formerly, when the best Silesian lump coal was used, blackened the walls and floor of the hotel court, and formed a nuisance of which his guests frequently complained. It was, in fact, for the purpose of abating the smoke and soot plague, rather than of saving expense of fuel, that the system was adopted for trial. The coke dust used as fuel contains a high percentage of inorganic matter, and the yield of ashes is thereby necessarily increased; but, all elements duly considered—cost of fuel, labor of removing ashes, etc.—the fuel cost of running the engine, month by month, as compared with the previous year, has been less than one-fourth of the fuel cost for the same boiler, engine and electric current generated with Silesian lump coal.

At the cloth works in Guben the problem was somewhat different: (1) To get rid of the smoke and soot which poured from the furnace chimney and defiled the premises, and (2) to use as fuel a kind of brown coal found in large abundance near the factory, which contains about 2,400 calorics, and is therefore a fuel of too low a grade to be used by ordinary means. For this reason the market price of this brown coal, delivered at the factory, was only 3d per centner, or 5s ($1.20) per metric ton (2,200 pounds)—a very cheap fuel, indeed, for Germany; but with these patented grate bars it was so absolutely smokeless, and otherwise so satisfactory, that after three weeks' experience with one boiler the managers had their three boiler furnaces converted to the new system, and after eight months' constant use certify that:

1. Their saving in fuel by the use of brown coal, instead of Silesian steam coal, has been 110 marks per week.
2. The smoke and soot from which they previously suffered have been entirely suppressed.
3. The grate bars remain in as good condition as when first used, and the fire burns easily and under perfect control, so that no injury has resulted to boilers or furnace walls.

Exhaustive tests of the new system have been made by Mr. Gustav Durr, directing engineer of a large tubular boiler factory at Dusseldorf, who writes in most convincing terms, declaring that this system of furnace construction will bring into use as fuel for steam and many other heating purposes not only the vast product of coke dust from the Westphalian coal and iron district, which has hitherto been used for road-making and ballast for railway tracks, but also the immense brown coal and peat deposits of Germany. This, in many manufacturing districts of this country, will revolutionize the whole economy of heating for steam and other purposes, and German economists are already counting upon the sudden advantage that this new method will give to certain of their industries which now have to use expensive coal brought from long distances.

Another series of tests, extending over a period of six weeks,

has just been made in Berlin by M. Ternbreg, chief engineer of the government of Sweden, as a result of which negotiations are now in progress for the sale of the Swedish patents on this furnace to the government of that country, in order to enable the people to utilize the vast deposits of peat, which cover thousands of square miles in Scandinavia, where little or no coal exists, and almost the entire supply has to be imported from Great Britain.

From the standpoint of general utility, the advantages which seem to have been secured by this system, and which will render it important to the United States, may be summarized as follows:

1. The smokeless consumption of bituminous slack and other waste of mines and coke works in cities and towns.

2. The use for steam and heating purposes of the lowest grades of Western bituminous coals, peat, sawdust, etc., and the vast mounds of anthracite waste that now incumber the mining districts of Pennsylvania.

3. In naval vessels, notably torpedo boats, to secure such complete combustion of bituminous fuel as to eliminate smoke, which serves to indicate the presence and location of a war vessel to an enemy.

It will be understood that while any fuel—lump or nut coal, for instance—burns fiercely on this grate, perfect combustion with consumption of smoke gases requires the fuel to be pulverized, so that for naval purposes lump coal would have to be crushed in order to secure the best results.—*The Textile Manufacturer.*

CLAY IN MODERN BUILDING WORK.

THE USE OF BURNED CLAY in nearly all classes of modern building construction is to-day more extensive than at any time in the history of the building trades, and there are many reasons which indicate that its use is destined to increase greatly in the years to come. In all the varied forms in which the substance is thus employed its abundance makes its use a matter of economy, and at the same time it is the most efficient material obtainable and has a wonderful adaptability to the varied building uses. As to its ability to withstand climatic conditions there has never been any question, for no better material for resistance to heat and cold is obtainable.

Like all other building materials, in the hands of ingenious craftsmen clay is directed into many different channels of usefulness. Its strength is not to be questioned, and all kinds of burned clay are readily beautified in form and color. In these days of structural steel the construction of brick buildings does not decrease in the least. The fact is that brick work readily adapts itself to these modern conditions, and, when thus employed, appears to a better advantage.

To meet the modern demands there have been many improvements in brickmaking. Shape, texture and color have all been greatly improved, and at the same time there has been a decided reduction in the cost of production occasioned by the improvements in brickmaking appliances. Perhaps the advances toward adapting this building material to the exact requirements of builders have been greater than in any other building material. To-day the brick architecture in all the cities may well be regarded as the foremost feature of building construction from an aesthetic point of view, as well as from a practical and economic one. The skillful men and progressive firms in the brickmaking business have brought their line of manufacture up to a strictly artistic one.

Just what departures along building lines will in the future be opened up to the brick trade would be hard to say, but in view of the varied uses to which this building material is already applied there can be no doubt that our enterprising brick manufacturers will readily, aided by the skill in their employ, adapt their product to all new requirements of the building trade. Pure clay, the leading essential to perfection in this line of production, is one of the useful products of which we never hear anything regarding its depletion. The raw product for the continued advances in brickmaking, therefore, leads us to look forward to many advances in this already excellent building product.

The Canonsburg China Company, of Canonsburg, Pa., has awarded to Taylor & Crawford, of that town, the contract for the erection of its new pottery plant buildings. The contract price is $18,192, and work on the plant will be begun at once. The plant, when complete, will cost $50,000.

The Sharon clay manufacturing plant, of Sharon, Pa., has been purchased by the American Clay Manufacturing Company. Among the contracts now being filled by this plant is one for 7,000,000 bricks for the Sharon Steel Company. As soon as this is filled the plant will be put on sewer-pipe work.

GILBERT.

RUNNING DAY AND NIGHT.

If the success of the Wonder machinery can be judged by the growing demand for it, it is very pronounced, indeed. The manufacturers, the Wallace Manufacturing Co., Frankfort, Ind., write that they have all they can do to keep up with their orders despite the fact that they are working nights. They have already sold more machinery this year than ever before in the same time and feel sure that the year will close with a handsome showing for all who are using Wonder machinery. They are equipping many old machines with their new automatic cutting tables, which are constantly growing in favor wherever used and their pug mills and clay crushers meet the requirements of the trade and will continue good sellers for years to come. For full particulars see their ad. on page 499, or, better, write them for descriptive catalogue.

KEEPING EVERLASTINGLY AT IT.

A journal which has done as much as any other in advertising people and things quotes the fine old sentence, "You can't fill the bucket by one stroke of the pump handle," and adds: "Many business men insert a small advertisement once or twice in a publication 'as a trial,' and then sit back and wait to see what comes of it. Quite naturally, nothing—or next to nothing—comes of it. People who see your advertisement once or twice are just beginning to take note of what you say, and, perhaps, to resolve to give your goods a trial. The next time they look over the advertisements in their favorite paper you aren't there. Consequently the man who advertises steadily and persistently wins their confidence and gets their trade. It is quite just and proper that he should. Nobody is going to take the trouble to hunt up a man who shyly bobs up to the surface now and then and then bobs down again."

TESTIMONY OF A BABYLONIAN BRICK.

It is marvelous what a mass of detailed information has come down to us in the form of perishable brick tablets inscribed, or rather stamped before firing, with minute and complicated inscriptions and preserved in the buried libraries beneath the mounds of the Tigris and Euphrates Valley. Prof. Sayce is able, for instance, to tell us from one of these tablets how "a widow brought an action before the royal judges to recover her husband's property. She stated that after her marriage she and Ben-Hadad-Nathan had traded together, and that a house had been purchased with a portion of her dowry. This house, the value of which was as much as 110 manehs, 50 shekels, or £62 10s., had been assigned to her in perpetuity. The half-brother now claimed everything, including the house. The case was tried at Babylon before six judges, in the ninth year of Nabonidus, and they decided in favor of the plaintiff," for a woman's dowry was her own property. This might be an extract from the law reports of the Times, and other details of ancient Babylonian and Assyrian life are not less precise. "In the reign of Ammi-zadok three men rented a field for three years on terms of partnership, agreeing to give the owner during the first two years one gur of grain upon each acre. The whole of the third harvest was to go to the lessees, and the partners were to divide the crop in equal shares on the day of the harvest." This seems a pleasant kind of agreement worthy of imitation. The third year free of rent must have been delightful.—London Saturday Review.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Why Asphalt is Used Extensively.

Editor THE CLAY-WORKER:

I have been reading with very lively interest the articles on brick pavements by Mr. Tillson. It is gratifying to know that brick pavements are being introduced here, and are proving so satisfactory. It will necessarily be a slow process, for the powers that be are influenced by wealthy asphalt combinations with which the individual manufacturer or dealer in brick cannot hope to compete. Ultimately the people will demand the less expensive and more durable brick pavements, and will enforce their demands in such a way as to command attention.

Here is an item from the New York World of May 12 that will give an idea of the influence of the asphalt advocate:

—The Asphalt Mystery.—

"The opening on Thursday of the bids for the new asphalt contracts repeated the familiar experience of the old contractors bidding with their customary uniformity, of a new company offering to do the work at a reduced rate, and of a protest against the awarding of the contract to the lowest bidder. The bid of the new competitor, the Standard Asphalt Company, was at the rate of $2.05 per square yard; the other bids ranged from $2.60 to $3 per square yard, according to locality.

"At the opening of the bids in January the bid of the New Jersey Mexican Asphalt Company, although the lowest, was rejected on the ground of technical noncompliance with the specifications, and the courts upheld the rejection. As the new bids will probably be brought before the courts it is interesting to recall that the former extortionate prices of asphalt were all forced on the city by the artful limitations of the specifications. Prior to the breaking up of the Trinidad asphalt ring under Mayor Strong the city paid $3.80 per square yard for asphalt laid on the stone foundations. The competition price for the next two years was $3.08, a saving of nearly 20 per cent.

"On the proposed expenditure of $2,700,000 the acceptance of the lowest bid would mean a saving to the city of some $550,000.

"This would be a large amount of money to throw away on account of a 'technicality' in the specifications."

Verily, "for ways that are crooked and tricks that are vain," the asphalt people are peculiar. There will come a day when a combination of men—men of earth, earthly, but well vitrified and tough—will form a paving syndicate, and they will "go behind the returns" and compel a fair count for brick.

New York City, May 15, 1900. DANIEL E. RYAN.

Brickmakers to Lose Their Jobs.

—A Harrowing Tale From the Buckeye State.—

Editor CLAY-WORKER:

I am greatly distressed by information that has come to me from Cincinnati—the city in which was founded the National Association of Brick Manufacturers, the report of which meeting was such an encouragement to me in starting out in my life work. As I hold you in a great measure responsible for my career as a brickmaker I naturally come to you in my present trouble; and, as most of your readers will be distressed also at this information, I have no doubt but that you will publish this letter, as you have enough of the journalistic spirit to desire to create a sensation however much it may disturb other people. You may argue, however, that inasmuch as it is not in your power to prevent this information from reaching them sooner or later, and as "being forewarned is being forearmed," it is your duty to give the unwelcome news as soon as it comes to you. At any rate, since misery loves company, I shall not complain of the publication that will inform my fellow brickmakers that we are all in the same boat—that a storm is arising that will force us to give up the ship or go to the bottom. And think what it means to many of us to give up the ship—to be obliged late in life to sacrifice our investment, our money and knowledge, to change our occupation, our means of livelihood.

But not to hold you in suspense longer I will tell as briefly as possible the cruel information sent to me from the wicked city of Cincinnati—perhaps from "over the Rhine." I have a long, carefully prepared letter relating how that the author has "discovered a new, cheap and efficient method of making brick from glass—fusing our material and casting in molds, securing uniformity in density and color—impervious and practically indestructible. Can make house brick in 20 minutes, paving brick in 48 hours, of any color desired, save white." And now the most crushing statement that must paralyze every brickmaker—"We can make 8,000 pounds of brick, sewer pipe 6, 8, 10 or 12 foot lengths, chimney tops, garden vases, flower pots, house tile in all colors and sizes, drain tile, insulators, imposing stones for printing offices, display type one inch and larger, etc., at a cost of $2.50 for four tons." No wonder the author can clinch his letter to me with the prophecy that "the old style of making brick will cease within a year or two," and that in six days he formed companies in ten cities with capital aggregating $6,700,000 "among the best class of brick men." No wonder that there is a rush of brickmakers to get into this new process before it is too late. I am one of the favored few who has been offered this privilege of saving myself, but, alas! I haven't the price, and am afraid I cannot comply with the conditions. I am offered this county and two others adjoining if I can organize a company of $260,000 capital. I am sure there is not that much money in this county and I am not acquainted outside. What am I to do? What are we all to do? Do you not think it would be best to call the N. B. M. A. together in special session to discuss the impending crisis in our ancient and honorable craft? W. D. RICHARDSON.

Shawnee, O., May 16, 1900.

An Effective Dryer—A Convention Echo.

Editor CLAY-WORKER:

I read with much interest the brief letter from Mr. Eisenhart in the April Clay-Worker, under the head of "Good Advice—A Convention Echo." I fully concur with him as to the interest taken in N. B. M. A. affairs by many who are not

A. D. Keyser, Philadelphia, Penn.

members of that association; they ought to be, though, for while not attending the conventions they profit by the papers and discussions. Like Mr. Eisenhart, I have evidences (I am tempted to say painful evidences) of this in the form of many letters of inquiry about my dryer of which I spoke briefly at Detroit. While it is a pleasure to tell a fellow brickmaker of our experiments, especially when successful, it is a good deal like work to answer so many letters. I would much rather have met the gentlemen who have written me and have told them all about it at the Convention. It would have been a great deal easier for me and a great deal more satisfactory to them, too, I am sure.

Now, I wish, Mr. Editor, you would let me say to those who want further information about our dryer that the best plan for them to follow is to come here and see it in operation. Then they can ask as many questions as they please and I will try to answer them all. If I was to build another

dryer, I would make it some larger than the daily capacity of the yard. That is, with a machine capacity of 40,000 a day, I think, from my experience, that it would be well to have a dryer capacity of about 50,000, so that there would always be a little room in case of delay in getting the brick out of the dryer. Setting gangs are sometimes a little slow in getting started in the morning, and, if the dryer is full, there is a delay in getting brick away from the machine.

Several have asked what I think the best length for a steam dryer. My answer is about 120 to 130 feet. If a longer dryer is built, it requires too much pressure on the boiler to force steam to the end of the pipes and the expansion and strain on the pipes is greater. We have found from ten to fifteen pounds pressure on gauge fartherest from boiler sufficient to dry with fifty to sixty ponnds on a 100 horse boiler. We have saved a carload of coal per week since putting in the Martin dryer and to date it has not cost us $10 for repairs. I think the proper grade in these dryers is about ten inches in 120 feet.

I hope to see an announcement in The Clay-Worker soon that the next Convention will be held somewhere here in the East. Don't forget, Friend Randall, that there is a standing invitation from Philadelphia. Yours truly,

A. D. KEYSER.

Philadelphia, Pa.

That Rumbling Sound.

Editor THE CLAY-WORKER:

We note in the April number of The Clay-Worker that Mr. Tiffany is not yet convinced that the expansion of brick pavements is sufficient to form an arch so as to sustain traffic, and as well as being the direct cause of the rumbling sound found along with this condition. Mr. Tiffany also is pained as the evidence was strong in support of the truth of the statement citing Messrs. Purington and Eudaly as witnesses because he sees in this condition a certain defamation of character of vitrified brick as a paving material.

We are really glad that Mr. Tiffany presents his unbelief in just such a manner. The one fact that the expansion is as much as we claim only demonstrates the real merit of vitrified brick as a paving material—a dense, hard, tough material like iron or steel—that expands without breaking or destroying its texture is just the paving material we want, so strong that though the arch is 40 feet in width that it may and does sustain the heaviest traffic.

But the curb alone does not always furnish entirely the resisting skew-back. The curb itself is very often held in a rigid position by the sidewalk, approaches reaching up to it and often forming a solid body from the buildings to the curb.

Along a residence street this condition will often be found: the curb will be held in its position by the sidewalk approaches from opposite sides. The intervening space between the walks coming from the residences, not having the perfect support, they give slightly as the street expands, leaving that portion of the pavements in perfect contact, thus forming an alternating condition resulting from whatever cause, unless in the same street to the other.

The certainty of our position in this matter does not rest entirely upon merely riding over block after block of this pavement, but most of us have been furnished precisely the evidence that Mr. Tiffany suggested, that is, the removal of a section entirely across the street and found it exactly as indicated by the satisfactory proof to us.

The suggestion of Mr. Eldridge that the engineers are pretty well agreed that the rumbling sound is often caused by shrinkage of the concrete, we are not prepared to deny, but the shrinkage thus caused must necessarily be so slight as to be inconsiderate and if occurring at all must occur uniformly throughout the entire breadth of the street, or at least without reference to the temperature of the surface, depending on the condition of the mixture itself.

Of course where the brick are so soft as to absorb the moisture they will be expanded by a low temperature, or where the filling is so imperfectly done as to let the water in, expansion must follow in winter as well as in summer. But the concrete being separated from the brick by the sand cushion would rarely be heated to a temperature exceeding 60 degrees, and, therefore, would not expand with the brick.

Another condition incident, must be taken into consideration from the very nature of a street in relation to houses, shade trees, etc. The center line of the street will receive the greatest amount of heat, and at that point occurs the greatest expansion. It is scarcely proper, however, to discuss this condition resulting from what ever cause, unless in the same breath we speak of the perfect remedial qualities that are afforded us.

The expansion cushion that Mr. Grimes provided for in his paper will obliterate the whole trouble and bring about a continuing and so perfect a contact of the whole body of the structure of the street to the cushion, that no rumbling noise whatever will appear in either summer or winter.

We are very sure that if we are afforded a visit from Mr. Tiffany that we shall be able to demonstrate the truth of the statements here made without the necessity of bearing to his vision the vacuum and preventing him to put his hands therein in order to wipe out his unbelief. W. P. BLAIR.

Terre Haute, Ind., May 12, 1900.

The Plasticity of Clays—A New Theory.

Editor CLAY-WORKER:

After reading, with great interest, a brief discussion of the theory of plasticity in clays, I feel inclined to offer a theory of my own for the consideration of your readers. I do not claim that this theory is entirely original, but I think that it is so in some of its details. In brief, then, this theory consists in assuming that the plasticity of clay is due to the formation of the mass of the clay into minute, flexible and elastic flakes or scales, of varying size and more or less regular outline, which, when a sufficient amount of water lubrication is provided, slide freely on each other.

These scales are assumed to be not perfectly flat, but slightly bulged in the middle, so that, under pressure, they wedge firmly together and give the clay its power to retain any shape that may be given it.

Individually, each flake or scale forms a small envelope, somewhat similar to an ordinary paper envelope, and hereafter I shall refer to them as "the envelopes," in which a small particle of water is held between two elastic membranes, firmly fastened together at the edges. This particle of water is the water of crystallization, and causes the bulging of the middle of the envelope.

Suppose, for example, we have two pieces of thin sheet rubber, oval or oblong in shape, cemented together at the edges, and containing between them a teaspoonful of water; then we will have an exact reproduction, on an enormous scale, of the clay envelope, as I imagine it to be.

Now let us suppose, for the sake of argument, that this theory is correct, and see how some of the phenomena common to plastic clays are brought about. Take, therefore, a chunk of perfectly air-dried clay. It consists of these envelopes, each containing its particle of water, each in actual contact with all adjacent envelopes, but, on account of its bulging, leaving enough space for water to enter, and each held in its place by friction between itself and the other envelopes with which it is in contact.

I will call the openings left between the envelopes "the spaces," and the pores of the envelope membranes "the pores."

Now, drop the chunk of clay into a bucket of water. The water at once rushes in to fill the spaces, and, acting as a lubricant, enables the envelopes to move on each other. Having filled the spaces, the water forces itself through the pores into the envelopes, causing their sides to bulge, their pores to be distended, and consequently making the entrance of the water more and more free, as the process goes on, until a point is reached when the tension in the membranes of the envelopes equals the cohesive force tending to hold the different envelopes together. Then the pressure of the water forces the envelopes apart, and the formation of slush begins.

In the meantime, while the above process is going on, the gradual bulging of the sides of the envelopes has increased the size of the spaces and the quantity of water available for lubricating purposes, while, at the same time, the tendency of the envelopes to assume a spheroidal shape has reduced the area of contact between them. The latter enables the clay envelopes, assisted by the more perfect lubrication due to increased water in the spaces, to move more and more freely, and the clay becomes softer and softer.

Now, to reverse the operation, suppose we have a couple of handfuls of slush. This consists of a mass of water in which these swollen envelopes are floating, either singly or in masses of a half dozen to a hundred or more. As the water is driven off they float closer together, till they come in contact with one another, and the plastic stage is reached.

If the drying be now continued, the water in the spaces is driven off, the tension in the envelopes squeezes a little water out through the pores of the membranes, thus flattening the envelopes, making smaller the spaces and closing up the pores of the membranes. This process continues until a point is reached when the tension in the membranes of the envelopes is not sufficient to squeeze any more water out through their now almost closed pores. At this point shrinkage ceases, and the water left in the spaces passes off, leaving them vacant, or, rather, filled with air. The clay is then perfectly dry, and con-

tains only its water of crystallization, locked up in small particles in each of the envelopes.

To calcine this clay it must be heated to the temperature at which these particles of water fly into steam. The membranes of the envelopes, not being able to expand quickly enough to meet this sudden pressure, will then be ruptured, and the steam will escape through the spaces, leaving its envelope collapsed and torn, with the rough edges of the fracture turned outward to rub against every other envelope with which it comes in contact.

Of course, no amount of lubrication will enable us to run one file smoothly over another, and just so with these collapsed envelopes; and to try to wedge them together is like shuffling a pack of cards with split and torn edges.

In pugging, the constant contact with the knives of the pug will cause rupture of many of these envelopes and cause them to spill their water of crystallization. This may explain what is sometimes called an overpugged clay.

PITTSBURG, PA. BAYARD GUTHRIE.

Burning Brick with Lignite.

Editor THE CLAY-WORKER:

Seeing in your paper that T. B. Morrison is asking for advise for proper kiln to burn lignite (brown coal), I would like to say that the up-draft kiln should never be used with lignite as fuel. The down-draft and horizontal kiln, like the "Cossler kiln (described in nearly all handbooks for clay manufacturing, but always wrong), is the kiln which gives the best results. The fire boxes, grates and floors differ from the regular down-draft kiln.

The writer has manufactured 14,000,000 to 18,000,000 common front brick and roofing tile per year, all burnt with lignite of poor quality. Yours truly,

WM. LENDEROTH.

Flue and Chimney Proportions.

Editor THE CLAY-WORKER:

In your November issue the writer of the series of papers entitled "What Kiln Shall I Build?" invites remarks upon the subject under consideration. The invitation is made personal by the mention of my name in connection with others, and I am disposed to accept and embrace the opportunity offered to express some of my opinions upon the subject.

I feel somewhat at a disadvantage, as the author of the papers does not sign his name. The nom de plume that he uses, namely, "Flame," if it means anything suggestive of his personalities, might lead us to several conclusions. One might be that he is like burning smoke and gas, that will soon pass up the chimney into the air and be gone. Another suggestion is that he may be so bright, sharp, burning and consuming that light and dry substances would be destroyed by coming in contact with him. Whatever his nature may be, I deem the better plan for me to adopt is not to kindle his power against me, but only to touch him at long range, and then very carefully.

He states as generally admitted facts that the most perfect combustion and the highest economy in fuel are to be secured by the use of a forced draft—that is, an artificial draft caused by a blower, as against a so-called natural draft produced by a chimney.

I do not wish to dispute the statement that these two conclusions are generally admitted by "a recent scientific investigator," nor that they may be found "laid down in recent textbooks," but I would like to invite the attention of your readers to a consideration of the subject.

We all will readily understand and admit that in order to secure perfect combustion and economy of fuel we must have enough air supplied to the fire—that is, we must have enough draft. Neither the fire nor the fuel can know and neither cares how the air is supplied; hence it does not matter, theoretically or scienticfially, how the air is driven into the furnace. It may be blown in under pressure by some air compresser or blower, or it may be pressed in by the difference in weights of the cold air outside and the warm air inside the chimney. The only requirement is that enough air be supplied.

I grant that investigators may have decided that the most practical results may be obtained by the use of forced draft, but I suggest that their conclusions might possibly have been based upon some slight error in the premises. It may be that they were even slightly influenced by practical conditions outside of the mere matter of draft.

Probably we are all familiar with the methods said to have been employed by the engineers of the steamboats on the Mississippi river when rival boats were racing. We have been told that they burned oil, bacon and anything that they had that might urge the fires to greater heat, and that they would hang a big "nigger" on the safety valve to give the steam higher pressure.

I do not mean to intimate that those investigators intentionally or even knowingly did anything that was not fair or strictly scientific, but possibly they erred slightly in some point. Their measure of the chimney draft might have had a slight error. The chimney might not have produced the draft that its size would indicate. It might have been cracked or rough inside, or had some unfavorable surroundings such as hills, buildings or trees. Possibly the wind was unfavorable or the barometer stood low when the chimney draft was tested, and all conditions that might bear upon the subject might not have been given due consideration.

It may be possible that it is not practical to build a chimney that will furnish draft enough to produce the most perfect combustion and the highest economy in fuel. I say it may be possible that this is true, but I would advise your readers to be very sure that they have given chimneys a fair trial and to be sure that they have tried good chimneys before they abandon their use for the forced draft.

My mind sees many vexations and much expense in the use of a blast for supplying air to a furnace. It is possible, and I grant it looks even probable, that the thoroughly trained scientific investigator, in his laboratory and with his accurate instruments, may demonstrate that the most perfect combustion and the highest economy in fuel may be had by the use of a forced draft. This would be due to the fact that the forced draft is directly under the control of the operator, who can adjust it to the required conditions as indicated by the delicate instruments at his service. Granting this, it would yet be unwise for the masses of users of fuel to adopt a blast draft, for the simple reason that the means at their command are not sufficiently accurate to adjust the draft to the varying needs of the fires.

It might be better to have their furnaces and chimneys designed and constructed upon scientific principles, and then control the draft in practice as best they can with the knowledge and means at their command.

—A Query.—

There is a curious idea comes to my mind in connection with the remarks on the union of carbon and oxygen in the process of combustion. We are taught that the atoms of carbon and oxygen unite and that this union is facilitated when the fuel and air are finely divided and thoroughly mixed. Those atoms that have a "chemical affinity" for each other unite, and I wonder whether this chemical affinity acts like gravitation and the atoms draw each other, or whether they must actually come into contact before they will unite.

In speaking of the union of the oxygen and carbon, "Flame" says "it is in condition to unite with the solid carbon, and what liberated carbon is not consumed at this point is quite sure to be consumed before passing out of the heat zone directly above the fuel body." I do not understand what is meant by "liberated carbon," which he mentions as passing out of the heat zone. I have been taught that carbon is not known in the free state, either as a liquid or as a gas.

—"Flame's" Question.—

In reply to the question asked, I surely think the furnaces, size of kiln, flues and chimney should be proportioned in reference to each other. And yet the conditions are so different during the varying stages in burning a down-draft kiln that it is not possible to build the different parts in proportion for each stage.

When a kiln is first started a very small grate surface will suffice, but because of the large quantity of moisture to be carried a very large chimney would be useful. As the burning progresses, with an increase of heat, more furnace capacity is needed, but as the amount of moisture to be discharged through the chimney is smaller the capacity of the flues and chimney might be reduced.

After the upper part of the kiln has become as hot as it can be heated without melting the ware, the heat will not pass from the furnaces into the kiln as readily as it did when the kiln was not so hot, and the fires cannot be urged as much. This is easily adjusted by reducing the effective grate surface by allowing a part of the grate to become covered with clinkers.

In boiler heating, where the conditions are nearly constant, the grate surface, flue areas and chimney capacity can be very nicely adjusted, but in down-draft kiln construction the pro-

portions can only be adapted to one stage in burning. The relative proportions must necessarily be only an approximation or compromise that will give the best total results. It is well to have plenty of flue and chimney capacity, as any excess can be easily curtailed by dampers and cracks.

D. W. STOOKEY.

Does the Berg Press Infringe the Boyd Press Patents?

Editor THE CLAY-WORKER:

This is, indeed, a pertinent question, and one that will be fully determined by the United States Court. Testimony is now being taken in the matter, and we think it well to leave the question to be determined by the court rather than to argue it further in the papers. In the meantime, the letter of the inventor of the Boyd machines, Mr. B. C. White, which we republish in our ad. on page 421 will be sufficient to convince any fair-minded brickmaker that we are selling our own machine and no other.

Regarding the "unsupported assurances of Mr. Moroney" to protect purchasers and users of the Berg press, we beg to call attention to the statement in the February CLAY-WORKER (page 188) of the Anderson Foundry and Machine Works, builders of this press, and against whom the suit is brought, that they will furnish bonds whenever required to protect all customers in the use of the Berg press. This will be generally considered ample support of Mr. Moroney's statement.

The fact that we have sold eight four-mold Berg presses since this suit was started is sufficient evidence that brickmakers are willing to take our assurances in the matter, and that we are able to protect them to their entire satisfaction. All these machines, with one or two exceptions, were sold to old dry-press-brick makers, men who are not novices in the business, but are thoroughly familiar with the conditions of the trade, and have used other makes of dry-press machines.

Now, we have no quarrel with the Chisholm, Boyd & White Company, nor with any one else in the trade; neither have we any desire to continue a newspaper controversy. We are going our own way and attending strictly to our business of selling clayworking machinery. This keeps us so busy that we have no time or inclination to pick quarrels with our neighbors. The fight that has been forced upon us in the dry-press trade we take as a special compliment to the merits of the Berg press. CHICAGO BRICK MACHINERY CO.

Pittsburg Notes.

Ground has been broken for the erection of a brick manufacturing plant on the site of the old Keystone pottery plant at Rochester, Pa., twenty-five miles below Pittsburg. The new concern has applied for a charter under the name of the Miller Brick Company, and it will be backed by the Miller brothers, of the firm of William Miller & Sons, of Pittsburg, where the main offices of the new concern will be located. The chief product will be building brick.

Work is progressing on the erection of a $50,000 plant of the Canonsburg, Pa., China Company, and the plant will be ready for operation in a few months.

The Delaney Brick Company, of Fairchance, Pa., has been chartered under the laws of Pennsylvania and a new plant will be erected at once.

J. J. Hoblitzell, of Myersdale, Pa., president of the Savage Fire Brick Company, was a recent visitor to this city. The Savage Fire Brick Company also operates a plant at Ridgeway, Pa.

The Clearfield Fire Brick Company, located at Clearfield, Pa., is busy on a number of large contracts for their specialty, the "Clearfield" fire brick.

Booth & Flinn, the well-known contractors of this city, have recently been awarded a number of large contracts for brickwork on new buildings to be erected in this city, and are doing considerable work along the same line for the city. This firm is one of the oldest and best known of its kind in Pittsburg.

The Union Brick Company and the Boyd Hill Brick Company, both of which plants are controlled by the Hersperger Bros., of this city, are among the very busy brick plants in this district.

Harbison & Walker, of this city, are at present engaged on a number of important contracts involving a large amount of silica brick.

The present activities in the coke region of Western Pennsylvania is particularly beneficial to the brick interests. It is estimated that during the present year there will be erected some 2,000 new coke ovens. There is scarcely a coke firm in the region which is not now making material additions to their plants and all of these improvements involve large brick contracts. Among the plants now projected is one of 300 ovens to be erected in Ligonier Valley by the Federal Coke Company. This firm is now erecting several new plants in Fayette county. The H. C. Frick and the W. J. Rainey Company are also erecting many new ovens, as are the Cambria Steel Company and the Hostetter Coke and Coal Company.

The improvements to be made by the Carnegie Steel Company at its different plants will involve large brick contracts.

A fine new brick building is to be erected to take the place of the building of Armstrong & McKelvey, which recently collapsed, on Wood street, in this city.

The brickwork on the new plant of Spang, Chalfant & Co., of Etna, Pa., will be begun at once, the steel structural work having been about completed.

The new $5,000,000 plant of the Sharon, Pa., Steel Company will carry with it one of the heaviest brick contracts of the year in this district.

A $3,600,000 addition is to be erected to the Pittsburg Carnegie Institute, the above sum having recently been donated by Andrew Carnegie for that purpose. The present building represents an outlay of $1,000,000, and, with the endowment fund in reserve, the latest gift brings the amount donated by Mr. Carnegie to this institution up to $6,600,000. The proposed work will be done under the direction of the board of trustees, of which C. M. Schwab is treasurer. The architects are Alden & Harlow, of this city.

Brick building work was somewhat crippled for a week or so in this city through a strike of the bricklayers. The difficulty has been removed by some concessions on the part of the contractors and the men are all back at work again.

GILBERT.

Nothing the Matter with Kansas.

Publisher CLAY-WORKER:

Inclosed please find money order for $2 for The Clay-Worker for 1900. The year 1899 has been a very prosperous one for us. We made over eight million brick, and are still behind our orders. Started up on the 10th, after a three weeks' shutdown for repairs, and expect to make brick every day from now on.

Capital City Vitrified and Paving Brick Co.

TRADE NOTES

The Darlington (Pa.) Brick and Mining Co. has been incorporated by D. J. Kennedy, J. C. Adams, John A. Kling, C. W. Seawright and others, to manufacture brick and mine coal.

Somer's Brick Co. has been incorporated with a capital stock of $100,000, by Samuel Warren and Herbert Somers. The principal office of the company will be at Atlantic City, N. J.

C. N. Adams has purchased the brickyard of Huffman & Wilson, at Alexandria, La. He will make a number of improvements in the plant and run same full handed the year through.

The pottery of Bell Bros., at Findlay, O., was totally destroyed by fire the latter part of last month. The loss is estimated at $35,000, covered by insurance. The plant will be rebuilt at once.

The Anderson Foundry & Machine Works, Anderson, Ind., write that owing to the great increase in the volume of business they are erecting a new brick and stone addition to their factory, 100x30 feet, two stories high, and are also installing more large tools, among them an 84-inch planer, and a 72-inch boring mill. When the new building is completed and fully equipped, they will be able to turn out work much faster than they can do now. The demand for the Berg dry press, which they now manufacture, is so great that they are obliged to make extensive enlargements in their plant, despite the fact that they recently purchased another factory at Elwood, Ind., formerly occupied by the Elwood Iron Works. The latter plant will be run almost exclusively on machinery for the American Tin Plate Co.'s plants and minor job work. One of the specialties of the Elwood plant is heavy forging. They are equipped with immense steam hammers of great capacity. They also have a special equipment at this plant for welding stems and other forging for gas and oil tools. There are no idle moments for those connected with the Anderson Foundry and Machine Works these times.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION;

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIII MAY, 1900. No. 5.

CURRENT COMMENT.

The record of business failures in the United States for the first quarter of the year 1900 shows that they were fewer in number and less in aggregate liabilities than in any corresponding period in the past eighteen years.

* * *

W. D. Richardson's many friends will rejoice with him over the advent of a little daughter who arrived at his home May 2, and has been christened Sara Isabel. Shawnee is a much brighter and happier place of residence since that interesting event.

* * *

It is charged that machinery salesmen at times claim capacities their machines do not possess. That, of course, is poor business policy; but are not clayworkers themselves expected to exercise some discretion and judgment? They do not necessarily have to "swallow" everything whole.

* * *

We once upon a time heard a well-known brickmaker confess that, in delivering brick to a job, the bats or broken brick somehow always found their way to the middle or bottom of the load. Another said he had known a competitor to slip a coin in the hand of a job foreman to facilitate the laying of soft brick before the appearance of the architect.

* * *

We advise those of our readers who are nervous or subject to heart failure to skip the communication from Mr. Richardson under the head of "Brickmakers to Lose Their Jobs." Shades of Pharaoh! but it is a tough proposition to face. But it is just as well to face it bravely and be prepared for the worst. It would not be a bad plan to make the best of the present opportunities, make all the brick possible and raise the price a dollar or two per thousand. If it is to be your last season, let it be a profitable one anyway! We will be prepared to change our title to Glass-Worker, and start even with the procession when the proper time comes. Until then the subscription price remains the same.

* * *

The building interests in nearly all the large cities are lagging because of labor troubles. The agitator has made business for himself by inducing strikes that mean idleness for those who lend him an attentive ear. In a large majority of cases the troubles are really causeless. There is no demand for increase of wages, but, instead, a demand on the part of union organizers for recognition or the right to dictate in matters of little consequence, but which, once granted, give them arbitrary powers that are unreasonable and hurtful. What promised to be an exceptionally active season now bids fair to be wasted in bickerings and strife which benefit none and injure many. So far as labor is concerned it is a clear case of "killing the goose that lays the golden egg." Why rational men will submit to such leaders is something no fellow can find out.

* * *

Considering the extent to which brick men figure in politics, it is little less than marvelous that seldom or never are they connected with any of the scandals or corruptions that occur in public life. Whether it is because of their superior honesty or sagacity, it is to their credit. The case that is now vexing the public mind seems to be the exception that proves the rule. Mr. Neely, who, it seems, is the chief culprit in the Cuban scandal, is reported to be a brickmaker. This, we think, is unjust to the craft. He has not been identified with brickmaking long enough to imbibe the sturdy qualities of honesty that the work carries with it. In this connection we wish to say that neither is he a representative Hoosier politician, as some of the press reports indicate. On the contrary, he is scarcely known beyond the confines of the town of Muncie, his former home.

One who has been there tells us that Cuba is not a very good place to make brick anyway. There is very little demand far brick there. Our acquaintance, who traveled on the island for six weeks, saw only four or five new buildings under way, excepting those in charge of the government. With the granting of independence to Cuba, manufacturing and the investment of capital there is risky. So long as the strong arm of our government is there investments will be safe, but, so long as there is an uncertainty, but little building will be done.

BRICK FOUNDATIONS.

In this city, a few years ago, there were a number of prominent and wealthy stone masons, men who had made their money building stone foundations for the buildings of this city and vicinity. These men are now practically out of the business. During the last few years the universal material for prominent buildings in this city, not alone for their upper structure, but for the foundation, has been brick. There are some exceptions to this statement. In one instance a prominent sky-scraper, which is faced with stone, has a brick foundation. Brick and Portland cement have in all important work taken the place of stone for foundation material. In the larger structures steel and concrete are used for the larger footings; in some of the smaller ones, concrete only. The heavy, ponderous, clumsy stone footing of a few years ago is not to be known in the future. The use of brick, as we all know, comes from the improvement in brickmaking and a proper knowledge in the use of cement.

GUARANTEES.

To many machinery manufacturers the subject of guarantees is a vexation to the spirit. Many purchasers of machinery require guarantees that are unreasonable. For new machinery, untried devices, machinery operating under new conditions, a guarantee in almost blanket form may be justifiable. However, for machines which have operated under varying

conditions, which have been almost universally successful, the question of guarantee is really of little consequence, but, if a guarantee is given that a certain machine will do a particular kind of work in a particular way, according to a specified form, isn't it equally incumbent on the purchaser of that machine to guarantee to operate it intelligently and successfully, so that it will not fail, to the discredit of its manufacturers? To have a piece of machinery thrown out of a plant for any cause is an injustice to the manufacturers, and ofttimes does them great harm. Explanations are always difficult.

Oftentimes failure happens through no fault of the machine or its manufacturers, but because of ignorance and carelessness of those who have charge of its operation. It is due to the manufacturer of every machine that it should have careful and skillful attention, and where this is not the case the manufacturer is the injured party. A case is brought to mind of an instance in France, where a purchaser, through ignorance or carelessness, condemned a machine and threw it out, and made the matter public in a way to discredit the maker of the machine. The result was a suit at law. The manufacturers established the merit of the machine they had sold, and not only recovered the machine, but also a considerable sum as damages to their good name. What's sauce for the goose is sauce for the gander.

THE ELEMENT OF EXPERIENCE.

In going through recent files of The Clay-Worker, which has had so much to do and say in connection with conventions, one cannot but have been struck with the element which experience has had to do with the working out of these problems and the element which experience must play in the perpetuation and proper application of the knowledge imparted through the printed proceedings of these conventions. As clearly as the ideas may have been expressed, and as intelligent as they were to the masses of our readers, it is only the broad hand of experience which can bring out definite, practical and satisfactory results. It is one of the elements of weakness in our school system that it does not unite experience with practical things in the work of the school system. Nothing is more difficult than to acquire useful knowledge without making it distinctly practical at all times. A boy will learn much more of practical geometry and actual handicraft and arithmetic in the building of a boat than he will learn in school or a theoretical school shop in months, and he acquires this knowledge in a way that will do some good.

It is this principle which makes the work of the kindergarten so beneficial. Knowledge and experience are most valuable when they go hand in hand.

SCIENCE AND EVERYDAY WORK.

Scientific methods are every day coming to be more used in the ordinary work of the world. We can prove this when we think of the history of brickmaking and brickmaking literature. Science has had a great deal to do with reducing the fire risk; has had a great deal to do with insurance matters.

Edward Adkinson, who, as president of the Boston Manufacturers' Mutual Fire Insurance Company, recently issued a pamphlet giving a history of the methods of the Boston Mutual Company. And in it one cannot but be impressed with the benefits which have come to the people at large through the union of science with that of the underwriter. The Mutual Company names insurance on manufactories in New England. This company carried $122,000,000 in risks last year, and lost only $65,000. This company, under the direction of Mr. Atkinson, has gone into the details of manufacturing from a scientific standpoint. The use of fuel, its liability to spontaneous combustion; the use of oil, its lubricating qualities and its liability to spontaneous combustion when united with other substances; the use of electricity and its manifold dangers and benefits. So with, in truth, the whole line of manufacturing and everything relating thereto. The building and all things connected with it have been carefully analyzed in a scientific way by a scientist for business men, digested for them, and thus put in practical form and so save thousands of dollars every year to owners of destructible property in this country.

TRADE LITERATURE.

WE ARE INDEBTED to the Eastern Paving Brick Co., Catskill, N. Y., for a neat little book on "Vitrified Brick for Street Pavements," by F. A. Cummer. It contains a brief treatise on the manufacture of paving brick as it is carried on at Catskill, and the composition and wearing qualities of Catskill brick as demonstrated by laboratory tests, and a detailed description of the best methods of laying brick pavements. The book is substantially bound in cloth, and is in every way a credit to the publishers. We presume it is intended for gratuitous distribution among the patrons of the Eastern Paving Brick Co.

THE LEADER MANUFACTURING CO., Decatur, Ill., have favored us with a copy of their sectional catalogue, No. 103, which contains a full description of the extensive line of brick and tilemaking machinery, which they make in various sizes and capacities to suit the demands of the trade. There are excellent illustrations of the Leader brick repress and a number of Leader brick and tile machines, with varying capacities, ranging from 20,000 to 80,000 brick per day; both side and end-cut automatic cutting tables, tile cutting machines, clay crushers, disintegrators and pug mills galore. They will be pleased to send a copy to any of our readers who will favor them with their address.

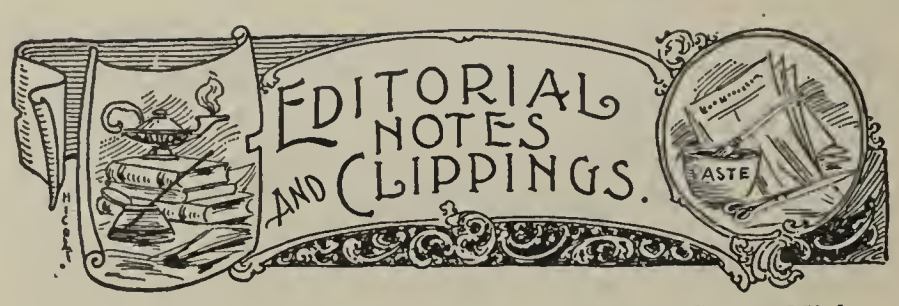
BOILERS AND ENGINES is the title of a substantial catalogue received from the Murray Iron Works Co., Burlington, Ia. The title page is both novel and striking in appearance—a group of factory chimneys, with their clouds of smoke being silhouetted in black against a background of gilt. Within the covers there are ninety-eight pages of illustrations and descriptions of their standard boilers and engines, which they make of almost any desired style or capacity. Excellent views of their plant are also shown, and give an idea of the immense capacity of their establishment. As is stated in their ad. on page 477, their facilities are such that they can supply high-grade engines and boilers at moderate prices. They will be pleased to send a copy of their catalogue to interested parties.

THE NEW YORK SCHOOL FOR CLAYWORKERS ELECTS A DIRECTOR.

Charles F. Binns, who has for a number of years been principal of the Trenton (N. J.) Art School, has accepted the position of director of the New York State School of Clayworking at Alfred University, Alfred, N. Y. Mr. Binns will go to Alfred the first of July to superintend the erection of the buildings and select the equipment for the school. The school term will not begin until Sept. 11. Mr. Binns is well known among the ceramists of the country, being vice president of the American Ceramic Society.

UNERRING SIGNS OF PROSPERITY.

Railway earnings for the first three months of the present year show a gain over those of the same period last year. According to Bradstreet's, the total earnings of 110 systems aggregated $153,843,998, a gain of 16.2 per cent. In every group but one the gain shows in excess of 10 per cent. This increase of earnings is well distributed in all sections, and is pretty good evidence of the general run of business the country over. Railway earnings are the thermometer of trade conditions. It is an infallible register, and when it goes up, there is something more than gush or idle talk in prosperity poems. It may have dry spots here and there, but even the deep sea has its sandbars.—Age of Steel.



A new brick and tile plant has been started at Capac, Mich.

Ramsey & Sunfield will establish a brickyard at Mulliken, Mich.

Charles Capron has opened up a new brickyard at Clinton, Iowa.

James Pertle has started a new brickmaking plant at Elmo, Kans.

The Harper Brick & Pottery Company has filed articles of incorporation at Seattle, Wash.

W. A. Orr, of Champaign, Ill., has purchased the brick plant of W. B. Holton, at Anderson, Ind.

The Emmer Brick plant, at New Iberia, La., was damaged to the extent of $200 by fire recently.

Nelson Bros. are moving their brick and tile plant from Greenville, O., to West Manchester, O.

J. W. McCoy & Co. is the name of a new firm organized to manufacture brick at Waitsburg, Wash.

Smith & Wilson have started a new brick plant at Bristol, Tenn., with a daily capacity of 40,000 brick.

Charles Fisher, of Milwaukee, Ore., writes us that he is in the market for a good Flower pot machine.

M. M. Galloway and D. A. Henderson will establish a brick plant of 30,000 daily capacity at Cornelia, Ga.

A company, of which Mr. H. Grant is the head, has been organized to manufacture brick at Kane, Pa.

S. S. Stadsvold and Louis Lohn, of Fosston, Minn., have established a brickyard at Lengby, that State.

Wm. U. Shaw and A. Carey have leased the brickyard at Tunkhannock, Pa., and will operate it during the summer.

The Danbury Brick and Clay Co. has been incorporated at Danbury, Conn., by F. R. Clark, D. N. Clark and F. P. Rice.

Long & Dickens contemplate putting in machinery and making other improvements in their plant at Great Falls, Mont.

A. T. Faber and Jacob Eminger have rented the Riedel brickyard at Chaska, Minn., and will operate the same this season.

The plant of the Joseph Soisson Fire Brick Co., located near Connellsville, Pa., sustained a heavy loss by fire recently.

James D. Collins, 412 Norcross Building, Atlanta, Ga., writes that he is in the market for a lot of iron dryer cars for brick.

O. Hodder and Lewis Heur have formed a partnership and will manufacture brick at Lincoln Place, a small town near Dravosburg, Pa.

The Standard Fire Brick Co., of Ottawa, Ill., has purchased the entire plant and business of the Ottawa Fire Clay & Brick Co., of that city.

Hankinson & Son, of Augusta, Ga., will establish a brick plant at Gainesville, Ga., with a daily capacity of from 75,000 to 100,000 per day.

Oscar F. Bledsoe advises us that he, with a number of other gentlemen, will start a new brickmaking plant at Grenada, Miss., in a short time.

Johnson Bros. have established a brickyard on the farm of Wm. Preble, at Madison, Me., and are making preparations to manufacture brick this summer.

F. H. Bingenheimer has started a new brick plant at Mandan, N. Dak. W. A. Sims, an experienced brick manufacturer, will have charge of the plant.

John Taylor, Jr., will operate the brickyard of C. D. Peters, at Brookfield, Mich., this summer. He will put in a new engine and boiler and otherwise improve the plant.

The Flint Brick Co., Des Moines, Ia., has just booked an order for 1,500,000 paving brick for the city of Minneapolis, Minn. They will commence shipping brick at once.

Work has been commenced on the new plant of the Jonesboro Brick Manufacturing Co., at North Jonesboro, Ark., and will be pushed to completion as rapidly as possible.

Nicholas Dietrich, a pioneer brickmaker of Sandwich, Ill., died at his home in that city recently. A local correspondent

(CONTINUED ON PAGE 470)

TABLE OF CONTENTS.

Terra Cotta in Brick Construction 427
Fire Brick: Their Manufacture and Use 428
Brick Pavements in Greater New York 430
A New Paving Brick Testing Machine 432
Button-Hole Talks 434
With the Philadelphia Brickmakers 435
A Brick Machine Manufacturer for Governor 435
Exact Instruments for Clay-Workers 436
Some Costly Bits of Experience 439
Jeffrey Columbian Separator-Screen-Bolter 439
Building Material in Cuba 440
Brick Mantels 441
A New Field for Brickmakers. 441
British Clay News 442
A Very Busy Factory 443
High Priced Help at the Brick Works 443
A Modern Manufacturing Plant 444
Horne Fire the Second 445
Clay Crushers and Pulverizers That Grind Exceeding Fine .. 446
Building Interests in Greater New York 446
A Hand Power Brick Press 448
A Remarkable Brickyard Accident 448
Defects of Glazes 449
Boston Baked Brick 451
Smoke Consumption and Economy of Fuel 452
Clay in Modern Building Work 453

CORRESPONDENCE.

A Proposition to Try Brick Pavements in Havana, Cuba. 434
An American Brick Machine Doing Good Work in China .. 438
Capital News 447
The New York Brick Market .. 450
Why Asphalt is Used Extensively 462
Brickmakers to Lose Their Jobs 462
An Effective Dryer—A Convention Echo 462
That Rumbling Sound 463
The Plasticity of Clays—A New Theory 463
Burning Brick with Lignite 464
Flue and Chimney Proportions 464
Does the Berg Press Infringe the Boyd Press Patents? 465
Pittsburg Notes 465
Nothing the Matter with Kansas 465
Trade Notes 465
Pacific Coast News 474
The Chicago Situation 476

EDITORIAL:

Current Comment 466
Brick Foundations 466
Guarantees 466
The Element of Experience ... 467
Science and Everyday Work ... 467
Trade Literature 467
The New York School for Clay-workers Elects a Director 467
Unerring Signs of Prosperity .. 467
Editorial Notes and Clippings. 468

MISCELLANY:

The Mis-sent Letters 448
A Change of Base 449
Sayings Wise and Otherwise ... 451
Running Day and Night 453
Keeping Everlastingly at it 453
Testimony of a Babylonian Brick 453
A Brick Plant at the Bottom of the Sea 474
How it Happened 476
Wants, For Sale, etc.

Index to Advertisements on Front Inside Cover Page.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

SAVE THE DROPS

WANTED MORE.

The Atlas Cement Co., Northampton, Pa., have in use six

CROSS OIL FILTERS

and we have just received their order for two more.

They don't order them for fun but because they fulfill our guarantee to save 50 per cent. of oil bills. The largest and best equipped Clay-working establishments in the world use them.

Send for Catalogue 43.

The Burt Mfg. Co., AKRON, O. U. S. A.

Largest manufacturers of Oil Filters in the World.

RAYMOND

BRICK MACHINERY

Where it is Used.

In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

RAYMOND BRICK MACHINERY is now used and in daily operation the world over. Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine.

Our great success has not been obtained without merit. Buy Raymond's and you get the best.

The C. W. RAYMOND CO.

DAYTON, OHIO, U. S. A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

in writing of his death says: "Mr. Dietrich had been identified with the brick industry of Sandwich all his life."

The Youngstown (O.) Brick Co. has been incorporated by F. McQuaillan, H. P. and H. W. Heedy, and J. Gallaher. The capital stock is $16,000.

Noel Duncan, of Santa Rosa, Cal., has secured the contract to burn 350,000 bricks at Occidental for use on the new brick block to be erected there.

Bierbauer & Shingle, of Mankato, Minn., have purchased a tract of land at Fairmont, Minn., on which they will open a brickyard at once. They have a splendid quality of clay, in unlimited quantities.

Among recent shipments of the McAvoy Vitrified Brick Co., Philadelphia, Pa., is a consignment of 250,000 brick to Havana, Cuba. This is the first lot of the 1,000,000 order booked by that company not long since.

The Brewer-Schrade Brick Mfg. Co., at Denver, Colo., has installed an electric light plant at their brickyards and will run their plant night and day in order to meet the large demand for their product.

L. Fickla has purchased the brick and tile yard of W. A. Glodfelter, at Minier, Ill. Mr. Fickla has been running the plant under a lease for some time, and the management will be continued as heretofore.

Anyone contemplating going into the enameled brick business will find it to their interest to correspond with the gentleman advertising over the signature, A. B. C., in the Wanted columns of this issue.

F. H. Goss and H. S. Griggs have incorporated the Union Pressed Brick and Railway Co., at Tacoma, Wash. The principal object of this company will be the development and extension of the Goss brickyard.

The vitrified brick plant at Vancouver, Wash., will soon start up for the season's run. The company has sold over 400,000 brick, which are now being shipped to Portland, Ore. This cleans up all the brick on hand.

The firm of Callendar & Alsip, at Winnipeg, Manitoba, has been dissolved by mutual consent. The business will hereafter be carried on by William Alsip, who has purchased the assets of the firm and will pay all the firm's liabilities.

The plant of the Crawfordsville (Ind.) Pressed Brick Co. has been sold to F. L. Warner, of Chicago. A number of changes will be made in the plant, the most notable being the installation of machinery for the manufacture of paving brick.

Joseph Sweetser, one of the pioneer brick manufacturers of Scranton, Pa., died quite suddenly while cutting sod in a field nearby his house. Mr. Sweetser formerly owned a number of yards in the vicinity of Scranton, but retired from active work some time ago.

Capt. W. H. Graves is at the head of a company that will at once establish a large pressed brick works at Graves' Mines, near North Birmingham, Ala. It is estimated the plant will cost about $40,000, and it is expected the works will be in operation in a short time.

The Standard Brick Co. is the name of a new concern organized at San Francisco, Cal., to control the output of the brickyards in that vicinity. P. H. Remillard is at the head of the company, which will not raise the price of brick, but maintain the present rate, $10 a thousand.

Several Eastern men, in association with residents of Santa Fe, N. M., are seriously considering the advisability of establishing a large plant in Santa Fe for the manufacture of brick and tiling out of the boundless quantities of fire clay in the hills at the head of Palace avenue.

Edward Keasby, president of the Raritan Hollow Brick Co., died at his home in Perth Amboy, N. J., April 27. Mr. Keasby was 73 years old and had been identified with the clayworking interests of New Jersey for nearly a quarter of a century. He leaves a widow and four children.

The office of J. D. Fate & Co., manufacturers of brick and tile machinery, at Plymouth, O., was visited by burglars recently. The safe was blown to pieces, but fortunately all the money had been removed in the afternoon, and the books were not damaged to any considerable extent.

A fire, caused by sparks from a switching engine, caused damage to the amount of $2,000 to the plant of the Ohio Mining & Mfg. Co., at Shawnee, O. Unfortunately, the company carried no insurance. This is the plant of which W. D. Richardson, worthy ex-president of the N. B. M. A., is general manager.

The new power plant of the Electric Street Railway Company, in the City of Mexico, is the finest in that country. American machinery is used entirely. The oiling system was ordered of the Burt Manufacturing Company, of Akron, O., manufacturers of the Cross oil filter.

The old Riesterer brick works at Tonawanda, N. Y., will be remodeled. The plant has been purchased by a new firm, known as the Tonawanda Brick Co. Mr. E. G. Reisterer is at the head of the concern.

The Lawrence Brick & Tile Co. is a concern recently incorporated at Lawrence, Mich., of which J. B. Marshall is president and E. S. Rockafellow secretary. They will put in machinery from the shops of the Wallace Manufacturing Co., and will begin operations as soon as possible.

I. C. Wheeler, the well-known brick manufacturer of Carthage, Mo., is making a number of improvements in his plant, putting in a new disintegrator, and one of the Horton Manufacturing Co.'s Hercules brick machines. Mr. Wheeler is also thinking of putting in a dry press machine.

A large deposit of fire clay has been discovered at Handley, Tex. H. Jennings, of Ft. Worth, Tex., who is interested in the matter, is having tests made of the clay. If the clay proves to be what Mr. Jennings expects, a plant will be established and the manufacture of brick be begun on a large scale.

The death of Frederick M. Gardner, of Savage, Md., occurred at Baltimore, Md., April 21. Although a young man, Mr. Gardner had entire management of the Savage Fire Brick Works, one of the most extensive concerns in Western Maryland, owned by Gardner Bros., and he will be mourned by a host of friends.

Wm. Carnegie & Sons, with office in the Carnegie Building, Pittsburg, Pa., have completed the organization of a new company to manufacture brick. The plant will be located at Rochester, Pa., on a site which contains about 20 acres. Machinery has been ordered, and the output will be about 25,000 brick daily. Only high grade building brick will be made.

The brick manufacturers of northern Minnesota and North Dakota have effected an organization to be known as the Northwestern Brickmakers' Association, of which Henry Ames, of Litchfield, Minn., is president; O. Ductor, of Little Falls, Minn., vice president, and L. Moline, of Willmar, secretary and treasurer. The next meeting will be held next February at Little Falls, Minn.

A new firm incorporated at Seattle, Wash., is that of the Harper Brick & Pottery Co. The principal place of business will be Seattle, while the plant proper will be located at a small town, known as Harmon's Landing, near Colby, Wash. F. C. Harper is president of the company. It is expected that the plant, which will have a capacity of 75,000 brick a day, will be in operation by the middle of June.

The Peach Bottom Cement Tile and Brick Co., of Baltimore, Md., has been incorporated to manufacture cement, fire brick, furnace and stove linings, paving, building and sewer brick, drain tile and other clay products, except roofing tile. The capital stock is $250,000. The incorporators are J. E. Brady, B. Wallis, Charles L. Hehl, Charles Glaser, Francis P. Curtis, Alvin Coriell and William E. Warehime.

Aaron Phillips, at Bowling Green, Ky., has had to make a number of improvements in his brick plant in order to meet the growing demand for brick in his vicinity. Among other improvements he has put in a new "Monarch" brick machine from the shops of the Wellington (O.) Machine Co.'s shops. Mr. Phillips has heretofore made brick by hand and the installation of this machine will enable him to more than double his output.

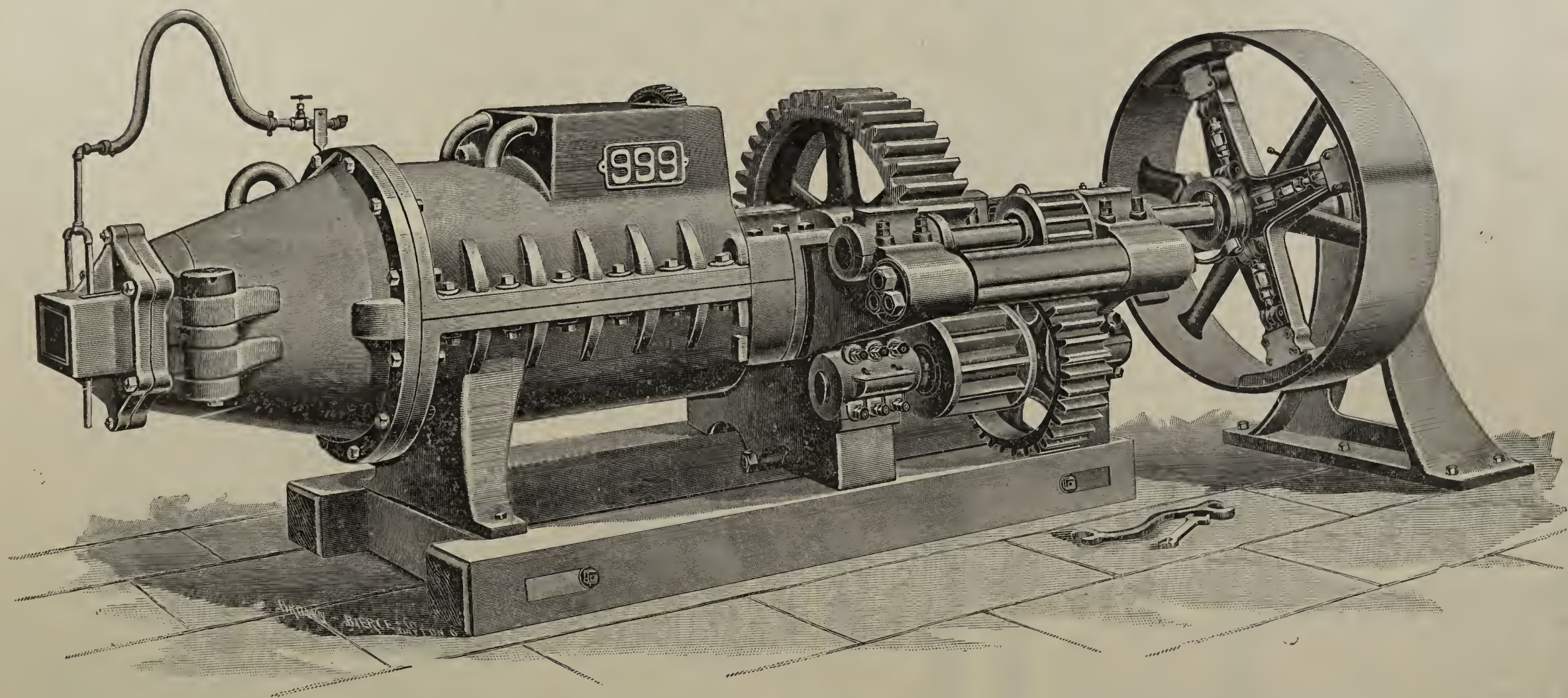
The Des Moines Building & Construction Co. has been incorporated at Des Moines, Ia., with a paid up capital stock of $10,000. Wm. Singer is president of the company, and says: "While the plant will not be numbered among the largest in the State, it will be a good sized one. We will build it primarily to supply our own contracting business, but, of course, once we get into the business we will be in it for all there is in it."

A new company, known as the New Washington Brick Co., has purchased the business interests of the Washington Brick Co., of Washington, D. C., for $50,000. The clay on the property of the old company has become nearly exhausted and the old company has decided to discontinue making brick. The company is composed largely of the officers and directors of the old company. They will continue the manufacture of brick for a time at the old plant, and then it will be moved to Virginia, where they have purchased over 200 acres of land.

Bellaire, O., is to have a new industry under the name of the Independent Brick Co. A large tract of ground has been purchased and a plant equipped with modern machinery will be established at once. The projectors of the enterprise are S.

[CONTINUED ON PAGE 4.2.]

Raymonds Large Capacity Brick Machine.



"Looks are nothing, behavior is all," is just as true of brick machines as of mortal clay. The above cut shows that our 999 machine is a good looker, and in operation it is even better than it looks. The very embodiment of strength, it is the machine for those who want to increase the capacity of their plant, while for the making of paving brick from tough shales it is par excellence. Its great power makes it possible to make good pavers from shales that can not be worked successfully in ordinary auger machines. This machine has many good points which we will gladly enumerate in detail to every brick maker who is interested. Address,

We also make a variety of superior Represses, Cutting Tables, Clay Grushers, Pug-Mills, Tempering Wheels and all kinds of Brick Yard Supplies.
Write for new Catalogue.

The C. W. Raymond Co.,

Dayton, Ohio, U. S. A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

H. Criswell, H. H. Criswell, J. F. Dubois and J. M. Criswell. The last named gentleman will be manager.

The men on the yard of J. P. Norton, at York, Me., went out on a strike recently for eleven hours, instead of twelve hours, to constitute a day's work. The strike was of short duration, as Mr. Norton, on investigation, found that the eleven-hour system had been adopted at most of the yards in his vicinity, and so granted their demands.

The large brick plant of James V. Rose, located at Sharon, Pa., was completely destroyed by fire April 19, entailing a loss of $45,000, which is but partially covered by insurance. Aside from this loss on the buildings, machinery, etc., the works were crowded with orders and had been running night and day for some time. The plant will be rebuilt at once, but in the meantime Mr. Rose will try to fill all orders by running extra time at his plant at State Line, Pa.

John H. C. Nonnemacher died at his home in Allentown, Pa. Mr. Nonnemacher was born in Allentown, Pa., fifty-six years ago, in the same house where his father and grandfather were born, and had passed his entire life in the brick business at Allentown, as had his father and grandfather before him. The Nonnemachers had been in the brick business in that city for ninety years. He was a progressive man, and by his death Allentown loses one of its best citizens.

A company, known as the South Fork Fire Brick Co., has been chartered at South Fork, Pa. The company is composed of Edward A. Barry, manager, treasurer and secretary, Johnstown; W. I. Stineman, South Fork, president; N. A. Loper, Johnstown, superintendent of works; H. C. Stineman, of South Fork, and John M. Rose, of Johnstown. A fire brick plant will be erected at South Fork at once, with a capacity to start of 25,000 bricks per day. The works will be in operation before August 1.

The Illinois Supply & Construction Co. have scored another success with their improved kiln. The Fulton Fire Brick & Mining Co. writes them under date of May 10, inclosing a check for an amount due on the deal, and adding: "We are very well pleased, indeed, with our kiln. It is certainly a good investment for us. We congratulate you on the effectiveness of your gas and coking furnace attachments." They will be pleased to give further details of this and other instances where their kilns have proven unqualified successes. See ad. on page 493.

The Chicago Brick Machinery Co., 225 Dearborn St., Chicago, Ill., have taken out articles of incorporation. There will be no change in firm name, and the officers elected are: J. J. Moroney, president and general manager; H. S. Hopkins, vice president, and A. M. Hopkins, secretary and treasurer. Their business has been very good so far this season, and among their sales have been a number of Berg dry presses. They have also equipped a number of yards with Wonder stiff clay machinery, and others with soft clay outfits, which are described and illustrated on page 422 of this magazine.

AN OUTING AT THE OCEAN.

SEASHORE EXCURSION, VIA PENNSYLVANIA LINES, WILL BE RUN AUG. 9.

The annual low-rate excursion to the seashore will be run via Pennsylvania lines Thursday, Aug. 9. On that date reduced fare tickets will be sold to Atlantic City, Cape May, Anglesea, Avalon, Holly Beach, Ocean City, Sea Isle City, Wildwood, N. J., Rehoboth, Del., and Ocean City, Md. The round trip from Indianapolis will be $15 to either of the ten resorts mentioned, which constitute the most popular summer havens along the Atlantic coast. No more enjoyable vacation outing can be planned than a visit to the seashore in midsummer. Arrangements may be made for participating in the pleasures offered by this excursion by communication with W. W. Richardson, D. P. A., Indianapolis.

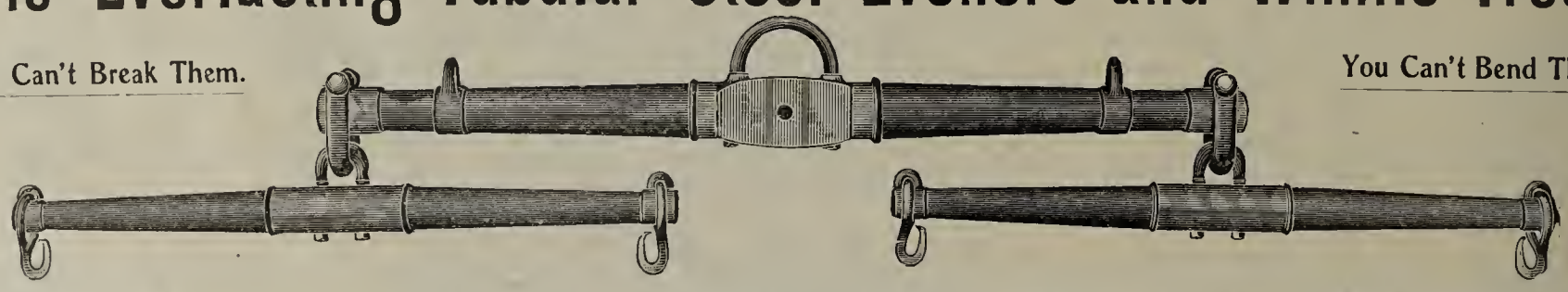
SUMMER OUTINGS—WHERE TO GO AND HOW TO GET THERE.

The seashore, mountains and lake resorts constitute the most attractive pleasure grounds for the summer idler. They are within easy reach via Pennsylvania lines, and agents of that railway system will furnish full information about rates, train service and through car comforts to any of the summer havens. They will assist in arranging details for vacation trips, and give valuable information free of charge. Apply to the nearest Pennsylvania lines passenger and ticket agent, and be relieved of all bother in shaping preliminaries for your summer outing and vacation trip.

W. W. Richardson, D. P. A., Indianapolis, Ind.

The Everlasting Tubular Steel Eveners and Whiffle Trees.

You Can't Break Them.



You Can't Bend Them.

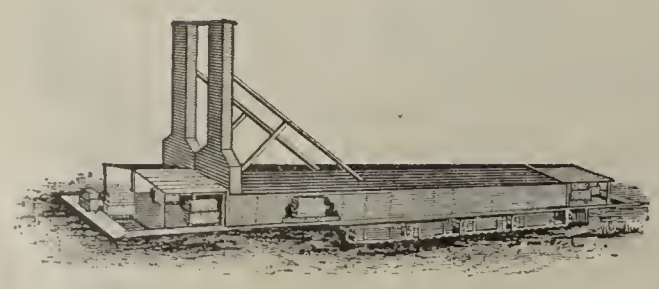
THEY are no heavier than wood wiffletrees and cost no more. You can't afford to be without them.

PITTSBURG TUBULAR STEEL WHIFFLETREE CO., Sole Manufacturers, P. O. Box 480 PITTSBURG, PA.

A. F. BARRON,

Patentee and Builder of the

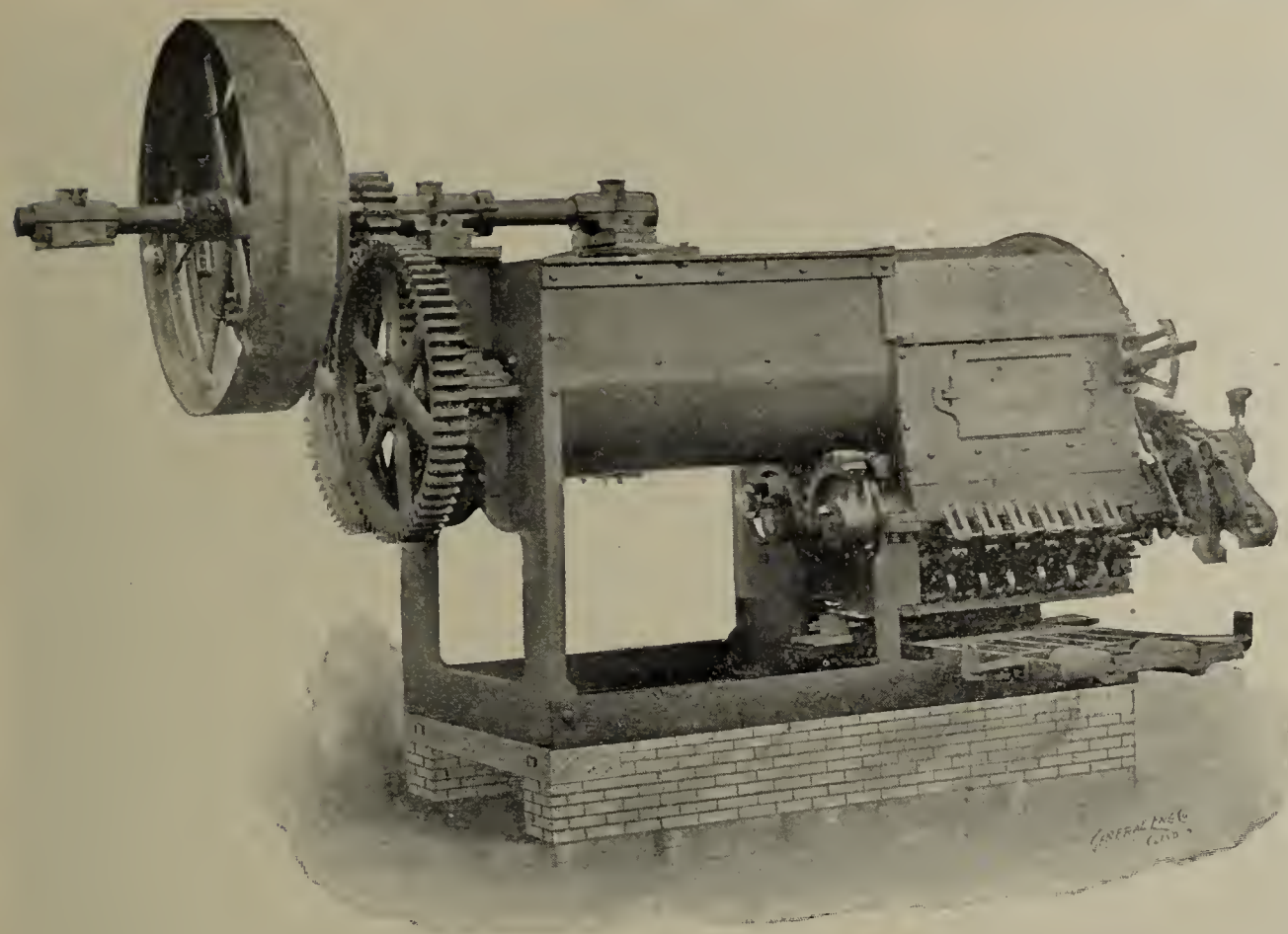
CHICAGO IRON CLAD and BARRON'S TENDER CLAY DRYERS.



These are the gradual outgrowth of a correct principle patented 28 years ago. Every year since that date has witnessed improvements that has kept this system beyond the reach of competition and we now can build Dryers to dry clay products of every grade, even if the clay is of a tender nature. The original principle is still retained. Crude methods of application displaced by money saving devices in steam fitting and construction—enabling patrons to turn out clay products of highest grade in strength and color and at a great saving in expenditure of fuel. In seeking information mention the peculiar nature of the clay, process of manufacture, etc. Address,

A. F. BARRON,

Temple Court Building. CHICAGO, ILL.



Over 75 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

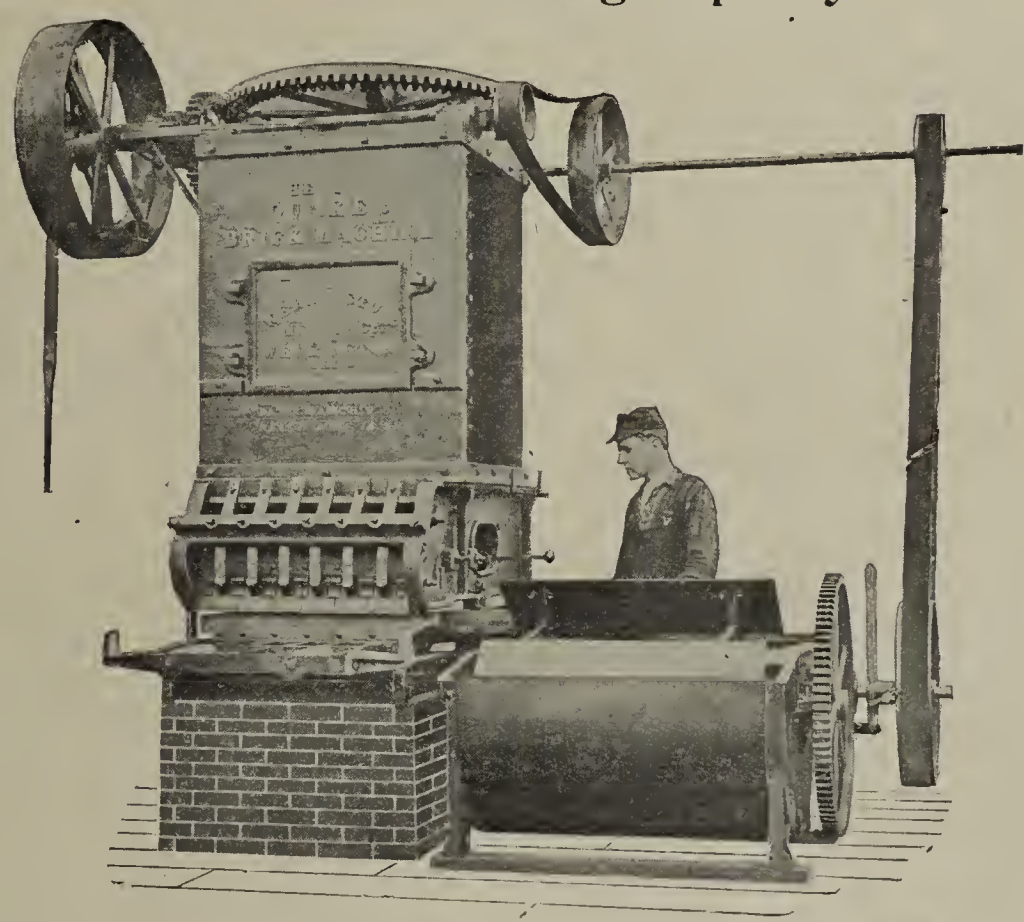
Long acknowledged the best for small and average sized yards.

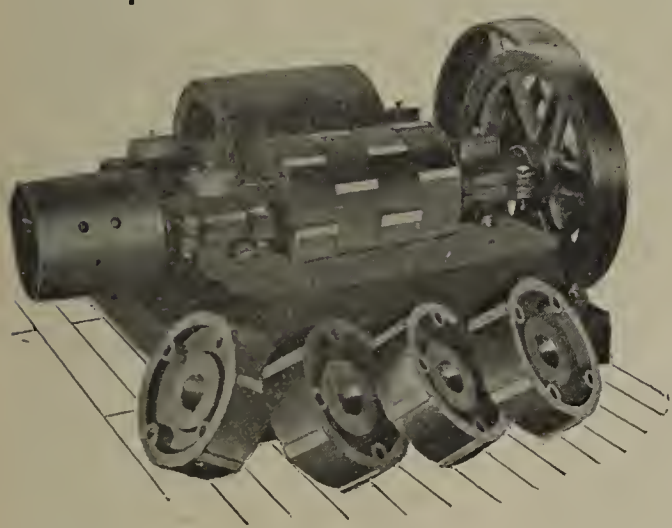
FOR 1900

We have added several new machines to our line.

Send for our 1900 Circulars.

Our mould-sander is the best, simplest and cheapest.

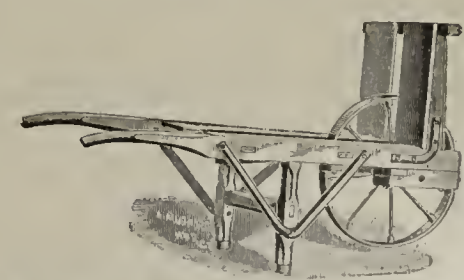


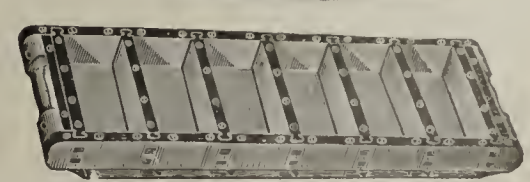


TWO Styles of Disintegrators, Solid rolls with inserted cutting bars and cutting roll made of hard sections.

MOULDS, TRUCKS, BARROWS,

and all other Supplies.





Nothing runs easier than our BALL-BEARING BARROWS AND TRUCKS.

The WELLINGTON MACHINE CO.,

WELLINGTON, OHIO.

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

THE CLAYWORKING FRATERNITY of this part of the world is moving along on rather quiet waters as far as specially large contracts are concerned, but the future holds out very bright promises of important work as some fine structures in San Francisco alone are being talked of and some are already beginning to grow. A prominent member of the terra cotta and brick trade, in conversation with your correspondent, said that the principal work at the present time is confined to minor contracts which are numerous enough to cause a healthy state of affairs to prevail. The situation is bright enough to make the dealers feel that a good season is in store on the Pacific coast.

Sam Houston is preparing to burn a kiln of brick at the old yards north of Chinook, Mont. The first kiln will contain about 100,000 brick, and the work will be continued all summer, or as long as there is any demand for brick.

J. H. Lee has sold his brickyard at Eugene, Ore., to J. M. Martin, of that city.

The Chmaber of Commerce Santa Ana, Cal., has taken steps towards securing a drainage tile factory for that city. The fact that so much land in the western part of Orange county, in the lower district, is being rapidly improved, makes a drainage tile factory particularly desirable, and the chamber has instructed its secretary to investigate the matter and correspond with Eastern manufacturers in regard to the feasibility of establishing one there. There is a large scope of country, extending from Newport north to Norwalk and Downey, where the system of tile drainage would greatly benefit the land, making it more productive and of much greater value than it is now.

At Kern's brickyard on the Powell's Valley road, near Portland, Ore., a kiln of brick for the new carshops building of the Southern Pacific Company is being burned, and soon will be delivered on the ground. All the yards have started, and before long there will be plenty of brick to meet demands.

T. Dunn, a prominent brickyard owner of Portland, Ore., has been in Sumpter, Ore., recently looking over the ground with the purpose of locating there.

J. W. McCoy is preparing to start a brickyard at Waitsburg, Wash.

The Little Falls Fire Clay Co.'s Works at Little Falls, Wash., are being operated full time on vitrified brick and sewer pipe, fire proofing and general clay products.

P. H. Remillard, of Oakland, Cal., president of the Standard Brick Company, which controls the output of all the yards in Central California, has practically closed the two yards in Stockton, Cal., for the purpose of securing a monopoly of the market and thus obtain better prices from contractors for a number of large orders soon to be placed. For months it has been generally understood that a combination has been effected whereby none of the yards in Central California would sell bricks for less than $10 per 1,000. The Standard Brick Company was formed for this purpose, and as soon as a new company is formed it is either subs dized, bought out or forced out of business by this corporation, though those interested in the big company say that to maintain a uniform price is the main object of the corporation. It has six large yards and aims to supply all of the bricks used in the northern part of the State. The principal kilns are at Pleasanton, San Jose, Greenbrae and Sacramento. The two concerns which are said to have been brought into line by Mr. Remillard are the San Joaquin Brick Company and the Roberts Island Brick Company. One of the main objects of keeping small brickyards from being operated at present is the fact that there are several immense contracts to be let soon. One of the biggest in San Francisco is the construction of the Baldwin Hotel. A large quantity of brick is being used in the Postoffice Building, and there are several other contracts that will require many thousands of brick, for which the combine expects to secure a uniform price.

Garrett Bros. are adding an automatic brick press at their yard in North Yakima, Wash., for making brick for fancy fronts.

C. E. Grouard is preparing to burn oil in the manufacture of brick at his yard on West Hickey street, Santa Ana, Cal. He will make at least 1,000,000 brick the coming season.

The Auburn Pottery Company, of Auburn, Wash., has become involved in litigation through the falling out of the partners in the concern, I. F. Young and George Porter. The former claims that he is entitled to a half interest in the business, and accuses Porter of shutting him out, appropriating funds and maintaining control in defiance of law. Porter contends that Young has forfeited all interest in the plant. Young has filed two suits against Porter. In the first he claims that at Auburn, January 18, 1898, Porter and himself formed a partnership by oral agreement to manufacture and sell pottery under the title of the Auburn Pottery Company. Porter, according to complaint, has unlawfully applied some of the funds and receipts to his own use, and threatens to continue so doing. Young complains that he is not allowed to see the books or have any say in the business. In the second suit Young asks for an accounting, the eventual sale of the plant and a division of the proceeds on a basis of one-half for Porter and one-half for himself.

McDonald Roberts has found a large deposit of genuine fire clay about two miles south of Kalama, Wash.

Peter Asmussen, George Kreger and N. Clark, of Nisqually, Wash., have found an almost unlimited quantity of china clay or kaolin, such as is used in the manufacture of porcelain dishes of all sorts. They have secured mineral rights to sixty acres along the line of the deposit, which is located on the north bank of the Nisqually, about nine miles from Eatonville. A shaft has been sunk thirty feet on the deposit during the past two weeks and there is a well developed vein of from eight to fourteen feet in width. The clay is as white and clean as chalk, and when moistened and worked it is as soft and smooth as putty and seems to fulfill all the requirements of true kaolin. The men who discovered these deposits are now in Tacoma, Wash., endeavoring to secure financial backing, which will make the discovery of some commercial value.

A BRICK PLANT AT THE BOTTOM OF THE SEA.

SOMEWHERE BETWEEN NEW YORK AND FRANCE, at the bottom of the ocean, lays a complete outfit of clayworking machinery. This machinery constitutes an exhibit shipped to the Paris exposition by the American Clayworking Machinery Co., of Bucyrus, O.

The exhibit included all that was necessary to equip a modern factory and was worth a large sum of money. The company had shipped the outfit on the French steamer Pauilac, and had sent on ahead several men to superintend the erection and starting of the machinery. After a lapse of a month's time the steamer was reported as lost. It was then within thirty days of the opening of the exposition and the American company's shops were overrun with orders, but it was decided to duplicate the entire exhibit, and orders were issued to that effect. Every department was put on its metal and the second exhibit was finished and shipped within ten days from the receipt of the order to duplicate the lost machinery, and the outfit is by this time in Paris.

Speaking of the matter the Bucyrus Telegraph said:

Adversity doesn't seem to dampen the ardor of the American Clayworking Machinery Co. of this city. Though their Paris exhibit is at the bottom of the ocean, they haven't set down to blubber about their loss. Not much. They haven't even scanned the dictionary in search of the most appropriate adjectives to poultice their wounds with. The bubbles have scarcely ceased to come up from the sunken hull of the steamer "Pauilac," as she settled in her last resting place, at the bottom of the ocean, before the American company has "spit on its hands" and commenced to tear the lining out of time in their endeavor to put a new exhibit in Paris for the exposition. The company has a motto which reads, "Doing Beats Promising," and they are "doing" with a vengeance. Every department is hustling. Every foreman has been asked, "How soon can you duplicate your part of the exhibit?" Most people would have said, "How long will it take you?" but the American company say, "How soon can you do it?" Why not try a little of this spirit in your own affairs. Hustle and push has brought prosperity to the American Company, it might do the the same for you. At least it wouldn't hurt you to take off your coat and make a bluff at it.

It has become a recognized fact among clay men that the American company maintains its reputation as hustlers and are noted for an amount of vim and push which ably backs up the well-known merits of their excellent line of clayworking machinery.

The steamer Pauilac has never been heard from. Not a man who was on the ill-fated vessel has ever been found. No vessel has ever sighted the steamer and no wreckage from it has ever been reported. It is now three months since she sailed from New York, and all hope for the steamer and her crew has been abandoned.

OUR MACHINERY IS USED
EVERYWHERE
LOST AT SEA.
Brick Making Machine Goes Down With Steamer Pauliac —Bucyrus Firm Losers.
[Special to The Press-Post.]
BUCYRUS, O., March 29.—Old Neptune and the mermaids will be able to manufacture brick, as the complete plant of brick making machinery shipped to the Paris exposition by the American Clay Working Machinery company of Bucyrus has gone to the bottom by the loss of the steamer Pauliac.
The company proposes to duplicate the exhibit, which cost about $25,000. Work on it has already begun.
PAULIAC
BUILT RIGHT RUN RIGHT
The Machinery that never Disappoints
HARPER

Written for the Clay-Worker.

THE CHICAGO SITUATION.

THE INDUSTRIAL CONDITION prevailing in Chicago stumps the "oldest inhabitant" for citing a precedent. The past month has been one of turmoil, bruises, etc., for union and nonunion men, challenges and "bluffs" on the part of the leaders of both factions, and masterly activity on the part of material men. The April grand jury took a hand in the situation by indicting several of the union leaders, together with a number of the rank and file, and for such unwarranted (?) meddling were severely criticised by the several labor bodies at their regular meetings, held on the 6th inst. The union leaders promise to have their inning when the next grand jury convenes, which will be on the 21st inst., at which time they claim sufficient evidence will be presented to warrant the indictment of contractors and material men galore. As yet there has been no exodus, and no appreciable anxiety shown on the part of the supposed guilty ones. Nowadays one does not look for mortar stains on the boots of a boss mason or slivers attached to a boss carpenter, to identify them in their respective lines. A glance at the right hip is sufficient; if the "hump" is there, the man is a boss contractor. A monster mass meeting is called for Sunday next by the unions, to devise a plan for defeating the contractors' association. In the meantime the contractors are confident they will win out. Trade in both brick and stone for the past month has, of necessity, been light. The country shipments made by the common brick interests were fairly satisfactory and went a long way towards paying expenses. It is a fact that Chicago's credit has suffered through insufficient police protection in creating a condition whereby neither life nor property was safe, under certain conditions. One favorable symptom during the past ten days has been a decrease in assaults committed by union men, partly because some of the most aggressive ones are either indicted, out on bail, in hospitals or buried. In spite of dissension, which threatens their very existence, the Builders' Club manages to spread chunks of gladness and good cheer in the pathway of its members. Saturday, April 14, the regular quarterly meeting was held at the club rooms, Chamber of Commerce building, about fifty members present. A substantial lunch was served at 1 p. m., after which the report of the Board of Managers was read, showing the affairs of the club in the usual prosperous condition. The labor troubles, of course, had first place on the list for discussion, and the members had the pleasure of listening to Mr. George C. Prussing, a veteran builder of Chicago (now practically retired), who in the past has had unlimited experience with labor troubles. Mr. M. B. Madden, chairman of the Dewey Committee, caused considerable merriment by saying he was collecting money from everybody but members of the Builders' Club, to make "Dewey Day" a success. Considerable excitement was caused by the appearance of President Gates, together with two prominent club members, who were arrayed in bright green neckties (they had, of course, their full compliment of other necessary clothing). Bets were offered two to one that it was in honor of the Chicago hospital contingent, who had arrived at the seat of trouble in South Africa, just in time to commence running. As the club bars politics, the offending members may be disciplined at the next meeting.

The Purington Brick Paving Company now have an office at 323 Chamber of Commerce building. Mr. D. V. Purington, president of the company, ably assisted by Mr. R. I. Corneau, is in shape to attend to anything in the paving line.

Mr. and Mrs. T. A. Randall were the guests of Mr. and Mrs. D. V. Purington April 28 and 29, at 4800 Kenwood avenue. Metropolitan life for a couple of days does one a deal of good.

Mr. W. D. Gates has just returned from a ten days' trip south, bringing with him his family, who have been at their winter home since February. The first two or three days on his return his friends fought shy of him until they could learn whether or not he had brought with him several barrels of his celebrated oysters. Upon learning that he failed to secure the usual offering for his friends at home, he is now met with the old time cordiality. Prosperity and the Gates brand of oysters are all right, but knowing the peculiar qualities of this particular oyster, and also alive to the serious industrial condition, expense is a factor, and the line is drawn at the oyster.

The annual convention of the Architectural League of America will be held under the auspices of the Chicago Architectural Club at the Art Institute, June 7, 8 and 9. Visiting delegates from the associated architectural clubs of the principal cities of the Union will be in attendance. Business sessions will be held during the day, and the evenings will be devoted to the Chicago brand of jollity. Mr. Richard E. Schmidt is chairman of the entertainment committee, and as the committee itself is made up of hustlers in the entertaining line, the visiting delegates have a rosy future. One of the features of the entertainment will be a tally-ho ride, taking in the special points of the city which would be of interest to the craft. The session will close with a banquet. If I can secure an invite, I will give The Clay-Worker a report of it in my next.

VERITAS.

Chicago, May 10, 1900.

REDUCED FARES TO DETROIT VIA PENNSYLVANIA LINES.

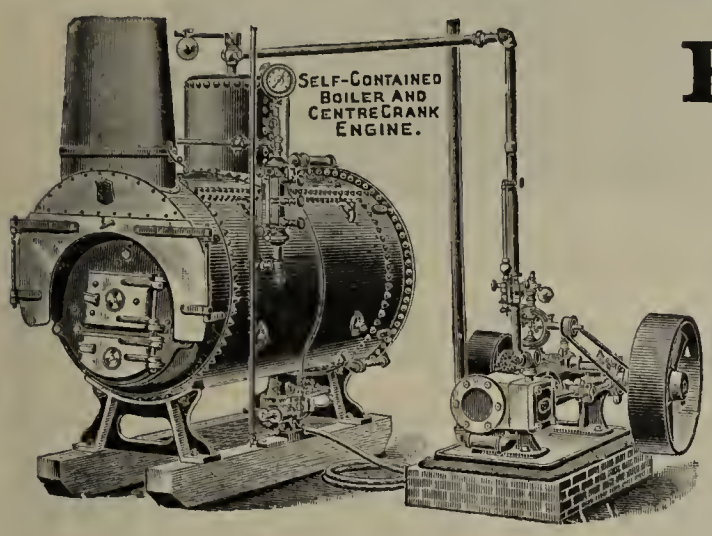
May 22d and 23d for National Baptist Anniversaries, tickets will be sold to Detroit, Michigan, from Pennsylvania Lines stations at reduced rates, valid for return trip, leaving Detroit not later than Wednesday, May 30th. For further particulars please speak to local ticket agent of Pennsylvania Lines, or address W. W. Richardson, D. P. Agt., Indianapolis, Ind.

HOW IT HAPPENED.

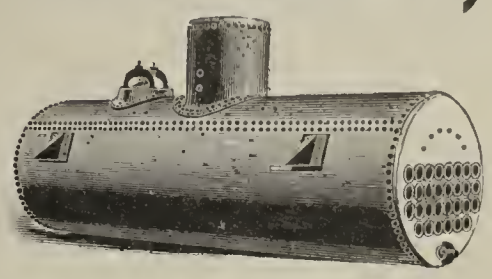
Mrs. Jones (*one a. m.*)—"How came you in this condition, sir?"

Mr. Jones—"Politicsh, M'ria (hic), politicsh! I (hic) drank one 'golden-fizz,' you know, and zhen I (hic) had to drink sixteen 'silver-fizzes' to preserve zhe (hic) ratio and my politicshal shtanding, you know."

THE MURRAY IRON WORKS COMPANY,



Burlington, Iowa,



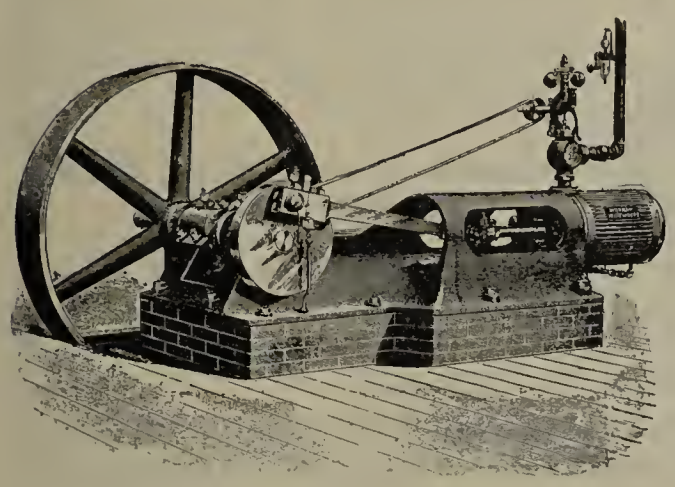
BUILDERS OF

Corliss and Slide Valve **ENGINES**

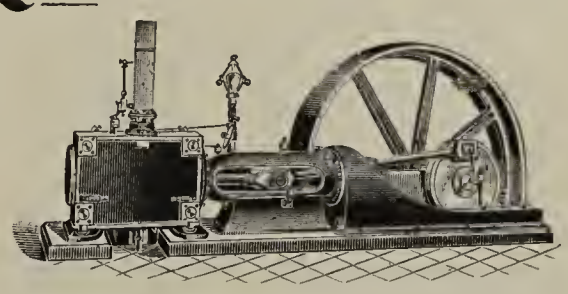
and **BOILERS**

For all Pressures.

Send for Catalogue No. 40.



OUR SHOPS are Fully Equipped With all the modern tools and appliances; we employ 400 men, carry thousands of tons of materials and can execute your orders promptly and at the lowest prices.



Outing BICYCLES.

HAVE a reputation that is not excelled by any line of Bicycles on the market. We are not resting on our reputation, however, but are keeping ahead of the times. Our Cushion Frame Bicycle is the ideal wheel for women. The difference between a Cushion Frame and a rigid frame is the difference between a spring vehicle and a springless.

Get our Catalogue and net prices.

Chainless $75.00.
Racer $60.00. Cushion Frame $60.00.
Road Wheels $50.00, $40.00, $30.00.

OUTING M'F'G. CO.,

Indianapolis, Ind.

Ask the editor of the CLAY-WORKER what he thinks of the "OUTING." He and his family have ridden them for years.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — Position as superintendent of enameling plant. For particulars address
4 1 c m OPAQUE, care Clay-Worker.

WANTED — A second hand, 9-foot dry pan; must be in good order and cheap. Address BUSINESS,
5 1 c care Clay-Worker.

WANTED — Enameler wants position. Can give proofs of ability to any one who means business. Address
5 1 d MINTON, care Clay-Worker.

WANTED — A good press brick setter. Also, one good brick shader for same. State qualifications and wages. Address
5 1 d C. W. J., care Clay-Worker.

FOR SALE — One E. M. Freese, Steam Mammoth Brick Machine, with cutting table complete. Capacity, 60,000.
CHARLES F. SHUSTER,
5 4 c Norwood, Pa.

WANTED — At once, first-class sewer pipe burners. Steady employment and good wages to industrious and experienced men. Address
5 1 f JONES, care Clay-Worker.

FOR SALE — One Jeffrey conveyor, 30 feet by 14 inches; one Adrian, No. 4, cut-off and tables—side cut; 32,000 pallets and racks for same; four two-wheeled double-deck trucks. Address
GEORGE WITHOF,
5 1 c m Liberty, Mo.

WANTED — A responsible position, enameled brick or terra cotta works preferred, by a thoroughly practical and experienced man. Open to consider proposition in any ceramic line. Can give highest of references. Address
5 1 k "A. B. C., etc., care Clay-Worker.

WANTED — Position as superintendent of brick works by a practical man; understands dry press or stiff mud, up or down draft kilns; can construct plant from ground up. Will accept permanent position with No. 1 company. Best of references. Location in the South preferred. Address
5 1 c SOUTH, care Clay-Worker.

WANTED — A situation as manager or superintendent of a clay manufactory. Have had experience in making and marketing building brick, paving brick and sewer pipe. Understand the management and control of men, and can give best of reference as to ability, etc. No bad habits. Address SENOR,
5 1 d care Clay-Worker.

WANTED — Situation as salesman or superintendent of a pressed brick plant; understand thoroughly the operative and commercial side of the business; have been very successful in selling front brick; familiar with common brickmaking, but would prefer connection with press brick plant. For references, etc., address
ANDREW CLEVELAND.
5 1 d care Clay-Worker.

FOR SALE — Prosperous brickyard, on account of death of both owners. More good orders for brick than can be supplied. Address BECKMANN,
5 1 d m care Clay-Worker.

WANTED TO PURCHASE.

Narrow gage saddle tank locomotive, Porter or Baldwin make preferred, also one steam shovel. Please furnish full description. Address LOCOMOTIVE,
5 3 6 1603 Monadnock Block, Chicago.

PERSONAL.

We seek the address of M. J. Carlton, formerly employed as brick works superintendent by The Weber Brick Co., of New Jersey, and by Mr. John Miller, of Washington, D. C.
CHAMBERS BROS. CO.,
52d St., below Lancaster ave.,
5 1 f Philadelphia, Pa.

KENDALL & FLICK,
MANGANESE
FOR ALL USES.
BOOKLETS AND PRICES ON REQUEST.
618 PENNA. AVE. N. W. WASHINGTON, D. C.

LEVIATHAN "It's a Brick,"

....EITHER FOR....
Transmission or Conveying.

And why it is in such general use among CLAYWORKERS, is that it may be run with less tension than other belts, does not slip; may be subjected to the most excessive weather conditions without injury, and as a result,

Outlasts From Two to Five Rubber Belts.

MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.
55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.
Write for Samples and Price List.

Anglo=American Pottery.

Old English China with American Views.

A MANUAL FOR COLLECTORS, BY
DR. EDWIN ATLEE BARBER, A. M., Ph. D.
Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

The price is $1.60 per copy, postage prepaid.

T. A. RANDALL & CO.,
The Clay-Worker.
INDIANAPOLIS, IND.

Mention the CLAY-WORKER,
When writing to Advertisers
Mention the CLAY-WORKER.

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels, Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., Western Ave, 17th-18th St. CHICAGO, ILL.

Our new Catalogue No. 25 (380 pages), will be sent upon application.

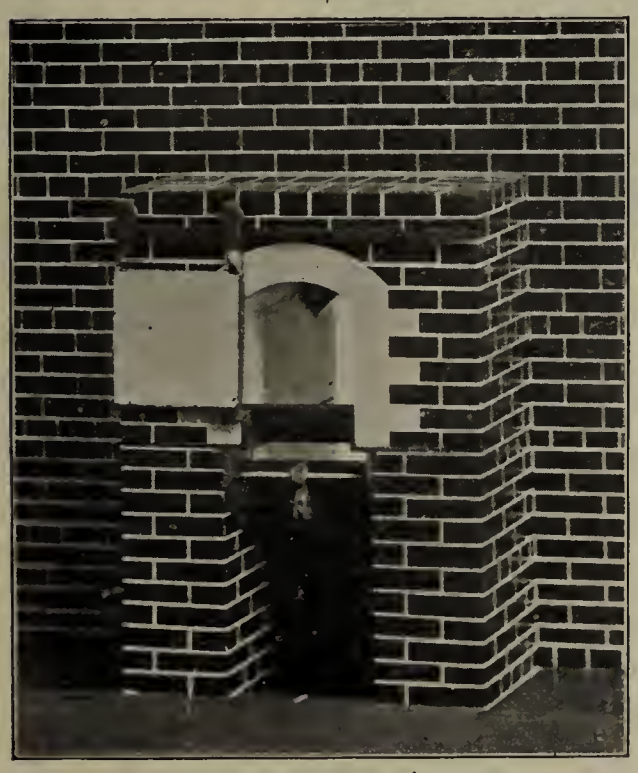
The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS, Agent and Patentee, **161 Grand Street, Rahway, N. J.**

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.



For **uniformity** in **burning, hardness of ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump,** and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

WANTED — A 60 or 72-chamber clay press.
MONMOUTH POTTERY CO.,
4 tf d Monmouth, Ill.

FOR SALE — One 42-inch Steadman mill, used only a few days; good as new; will be sold cheap. C. and A. POTTS & Co.,
4 2 1 Indianapolis, Ind.

FOR SALE — One No. 7 Penfield plunger mill. One Penfield elevator. One Morenci, Mich., cutting table. Address
4 3 c BARRED, care Clay-Worker.

WANTED — A brick works machinist accustomed to dry press machinery, plain and ornamental. State experience and wages wanted. Address
5 1 d C. W. J., care Clay-Worker.

FOR SALE — Brickyard fully equipped, central Iowa. Will sell whole or an interest to practical man. Cost $25,000. Less than half will buy it. Good reasons. Address "PAVING BRICK,"
4 3 c m care City Bank, Boone, Ia.

WANTED — Situation as superintendent or head burner of building brick plant. Have had many years' experience; understand both making and burning thoroughly. Familiar with the plastic and dry press processes, and can burn with either wood or coal. Desire a permanent situation. Can give the best of reference. Address
5 1 c "THOROUGH, care Clay-Worker.

FOR SALE — Fourth to half interest in brick plant, with daily capacity of 25,000 to 40,000. Fire clay, shale and common clay right at works. Also one hundred acres of coal (four feet vein); contracts now on hands for 3,000,000 brick. Will sell cheap to a practical man who can manage works. Reason for selling, too much other business. Address
WILLARD VANNATA,
Richmond, Ind.,
5 1 c m care Maxwell Hotel.

WANTED A POSITION

By a man that is thoroughly practical in the manufacture of fire brick, paving brick, building brick, sewer pipe and drain tile. One who can show first-class recommendations extending over a period of fifteen years. Is also experienced in construction; has been a success on the road as a salesman. South or the far West preferred; would not object to going to Cuba or Porto Rico. Climate more consideration than salary. Address
1 5 d WILSON, care Clay-Worker.

FOR SALE.

One Iron Standard steam power machine, with pug mill attached.
One Fletcher & Thomas pug mill.
One Anderson Brick Machine, with 12-foot pug mill.
Two reliable hand brick machines.
One new Brewer Crusher.
One second-hand Brewer Crusher.
One Carnell repress.
One Penfield No. 7 brick and tile machine.
One Penfield soft mud machine.
One Penfield double plunger brick machine.
One Freese board delivery cut-off table.
One Fate-Gunsaulus rotary table.
One forty-horse power boiler and engine.
One Monarch Machine, used two summer seasons; in excellent repair.
THE HORTON MFG. CO.,
4 tf d Painesville, O.

COMPLETE FINE BRICK PLANT FOR SALE OR TO LEASE.

For sale, or to lease, at a sacrifice, the complete equipped plant at Kreischerville, Staten Island, N. Y., formerly operated by the Anderson Pressed Brick Company. This plant is probably the finest in the country. It is fully equipped for the manufacture of all grades of pressed brick, fire brick, hollow brick, paving brick, etc. The buildings are of brick and stone, and in the best condition, and were erected in 1898. The kilns, boilers, engines, clay conveyors, steam pressing machines, etc., were constructed in the most approved manner without regard to cost.

Unexceptional water from facilities of more than 1,000 feet; private canal, and ample docks for the reception and shipment of goods.

One of the finest clay banks in the country is a part of this plant, and readily accessible to the works. Sufficient clay, mined and dried, is on hand to permit the starting of the works at once.

This splendid property is offered for sale at a sacrifice, or will be leased at a moderate rental. Apply to JOHN WEBER,
5 1 c m 10 East 23d St., New York City.

WANTED — A first-class man as superintendent of a sewer pipe factory. State experience, salary expected and for whom you have worked. Address
4 3 d J. T. S., care Clay-Worker.

FOR SALE — One four-mold Eureka dry pressed brick machine, but little used, at a great bargain; one No. 2 Worrell dryer; one 48-inch Ross disintegrator.
C. SIEDLER,
11 tf d 156 Fifth Ave., New York, N. Y.

FOR SALE CHEAP — 5,000 to 6,000 Mershon C Pallets with risers on ends; Two 6-Mould Brick Machine (Soft Mud); One Winding Drum; Two 1½ yard Bottom Dump Clay Cars. Machinery practically new.
Address,
H. MULBERGER, Executor.
3-3 cm. Watertown, Wis.

FOR SALE — One Simpson dry press brick machine, four molds. One Johnson dry pan. Two represses. Makers, Carnell and Kueny. Two hundred cars and track for Sharer's dryer. All in good order. Apply to THE CHARLEMAGNE & LAC OUAREAU LUMBER CO., Ltd.,
3 3 c m Charlemagne, Quebec.

WANTED — Clay manufacturing plants to locate in cheap coal belt of southern Illinois and Indiana. Special inducements, with excellent quality of shale, pottery clay, fire clay and surface clay. Address
L. H. SKINNER,
Room 811, Lincoln Trust Building,
3 3 d St. Louis, Mo.

FOR SALE — Brick machinery.
We buy and have for sale all kinds of machinery; good second-hand engines, boilers, brick machines, crushers, pugs, presses, dryers, cars, rail, etc.
We have several yards in operation for sale. We equip entire new yards.
Write us what you want. Address
3 tf d C. W., care Clay-Worker.

FOR SALE — Two brickyards in first-class shape, pallet system. One three-machine yard, capacity five to six millions, sidings from two railroads direct to shed. One two-machine yard, capacity two and a half to three millions, siding from railroad direct to shed. Both yards load direct from kiln to cars. These yards located so they cover the markets of Massachusetts, Rhode Island and Eastern Connecticut, and are equipped ready to operate. MARCY & GARDNER,
4 3 d Palmer, Mass.

WANTED — A situation as superintendent or foreman of paving brick department in a clay manufactory. Have had years of experience, and can successfully manufacture blue vitrified paving brick, such as have proven so satisfactory in England. They are generally considered the most durable of all paving brick, and can be made from shale or clay used in this country in the manufacture of sewer pipe, etc. These brick can be made at small cost—little, if any, more than common builders. I will guarantee this and to produce paving brick the equal of any made in this country. I know whereof I speak, and do not propose to indulge in any experimental work. Can give the best of references. Address "BLUE PAVER," care Clay-Worker. 3-1-r

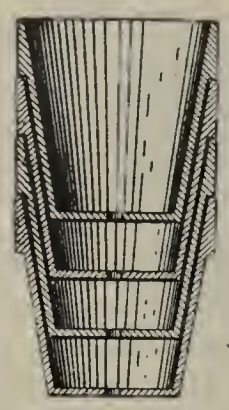
A COMPLETE BRICK PLANT FOR SALE AT A BARGAIN.

EVERYTHING NEW.

Only brick plant located in Warren, O., a town of ten thousand inhabitants. Having bought same at assignee's sale, must be disposed of at once.
THE HORTON MFG. COMPANY,
2 tf l Painesville, O.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.
PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.
SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH.
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 4 tf d



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

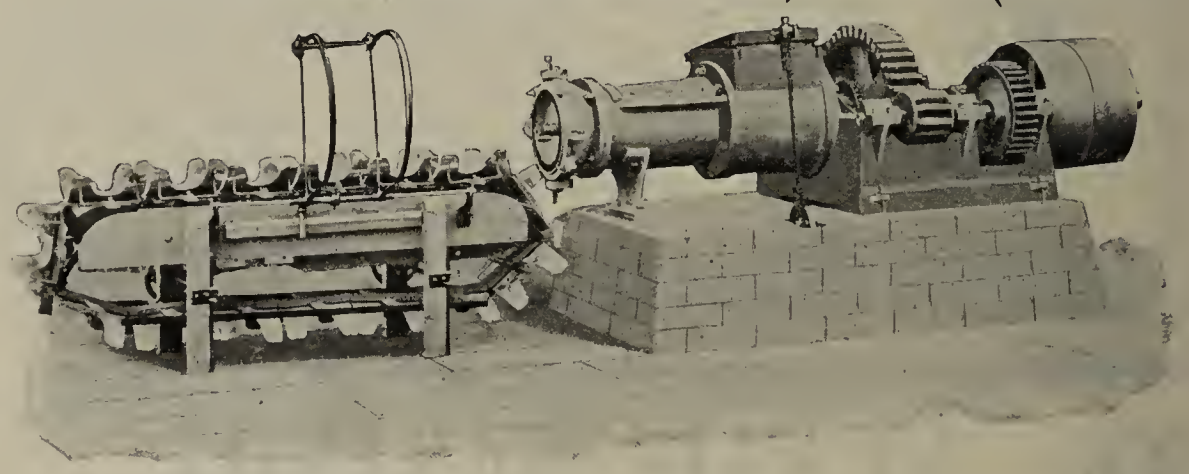
No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
78 South Pennsylvania St., INDIANAPOLIS, IND.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.
Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.
Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.
MADDEN & CO., Rushville, Ind.

Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,
Detroit, Mich., U. S. A.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

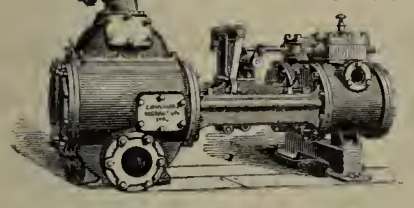
Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Dean Bros.' Steam Pump Works

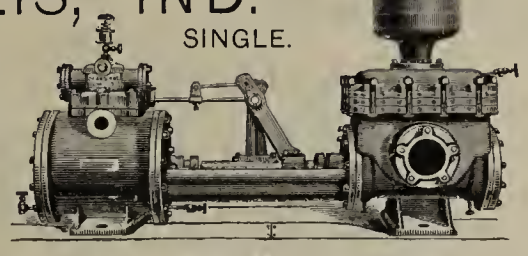
INDIANAPOLIS, IND.

DUPLEX PUMP. SINGLE.



PUMPING MACHINERY FOR ALL PURPOSES.

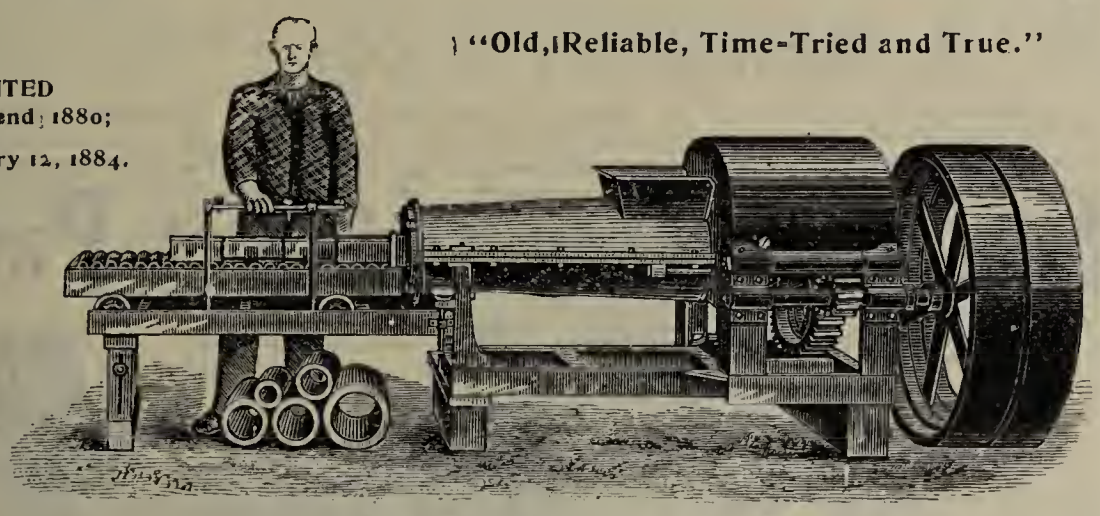
SEND FOR CATALOGUE AND PRICES.



KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED June 22nd, 1880; and February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
6 tf d Wellsburg, W. Va.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — Splendid plant for manufacturing brick and porous terra cotta. Situated 15 miles east of Cleveland, O., between Lake Shore and Nickle Plate Railroads, having switches from both roads. Has 25 acres excellent clay bed, boilers, 150 horsepower engine, machines, presses, steam dryers, kilns and full equipment. Reason for selling, owner nonresident and in ill health. For further information call at 701 Cuyahoga Building, Cleveland, or write to
2 4 dm W. B. OWEN, Hobart, Ind.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address
OLD BRICKMAKER,
1 tf d Care Clay-Worker.

WANTED — For a large clayworking establishment, located near New York city, an experienced superintendent or manager, who thoroughly understands the manufacture of fireproofing as well as common brick; applicants please state past experience, amount of salary expected, references, etc. Address
H. F. JAMES,
11 tf d 156 Fifth Ave, New York.

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

FOR SALE.

Michigan brick and tile machine, with upright pug mill, pulleys, tile dies 2½ to 12 inch, hollow brick die, hollow block die, side and end-cut brick dies and all cutting tables.

No. 2 Adrian brick and tile machine, tile dies 2½ to 8 inch, side and end-cut brick dies and combination cutting table.

Board delivery cutting table, new.

Little Giant repress, same as new.

Kiln grates.

30 horse power tubular boiler, with front, stack and grates.

Canton duplex boiler feed pump, new.

40 horse power center crank engine.

40 horse power tubular boiler, all fixtures complete.

Penfield double plunge machine, tile dies 3 to 12 inch, brick die and all cutting tables, same as new.

Rotary brick and tile table, nearly new.

65 foot, 8 ply, 14 inch Leviathan belting.
3 tf d J. F. CLARK, Morenci, Mich.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.

NEW YORK.

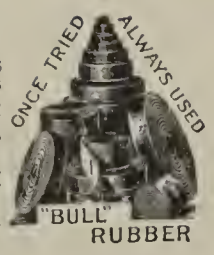
Sole Importers in the United States of the

Precipitated K.B. W.F.&C. Carbonate of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

ODD LENGTHS OF RUBBER AND GIANT RED STITCHED, from 2 ft. to 80 ft. long, and from 1 in. to 16 in. wide; 3, 4, 5, 6 and 8 ply. **First-Class Belting** less than mfrs. cost prices. **Get Our Prices** on Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gages, Brass Fittings, Hard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weiler Jacks, Circular Saws, Sawing Machines, One-Man Log Saws, Asphalt Felt Roofing, Endless Thresher Belts. **One Trial** will make you a regular customer of the **MILLER OIL AND SUPPLY COMPANY**, 36 McNabb St., Indianapolis, Ind.



VanDuzen's STEAM JET Pumps.

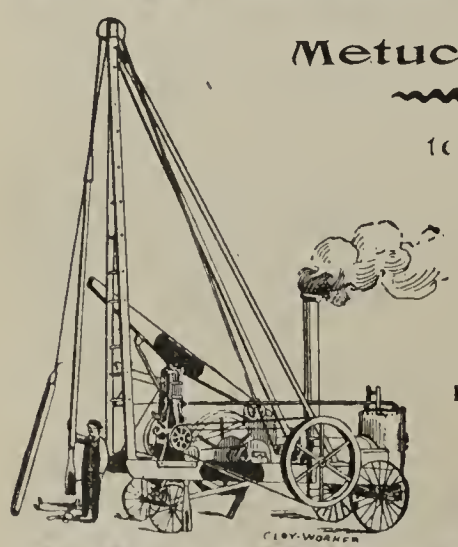
Lowest prieed reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** etc., for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

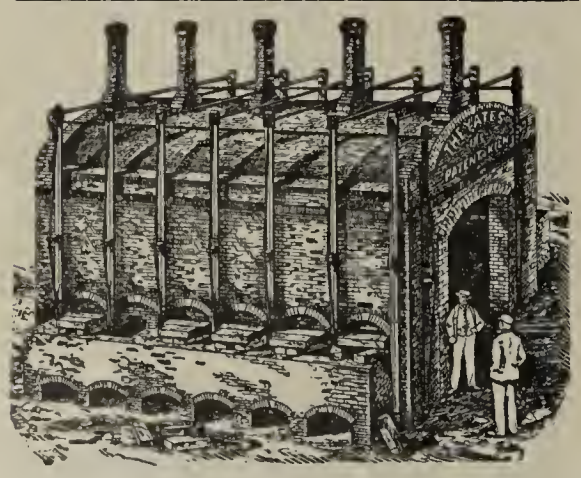
W. R. Osborne,

Metuchen, N. J.

Ice Wells, Tanks, Pumps, Etc.



LOW PRICES



Economy of Fuel and Large Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Construeted to burn without smoke and give an even distribution of heat, producing uniform burns. Hot air dryer. Continuous and Muffle Kiln.

ALFRED YATES,
JOHNSONBURG, PENN

Have you thought About your Cuts for your NEXT CATALOGUE? We Make 'em Right

INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.
INDIANAPOLIS, IND.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } Chenoa, Ill.

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

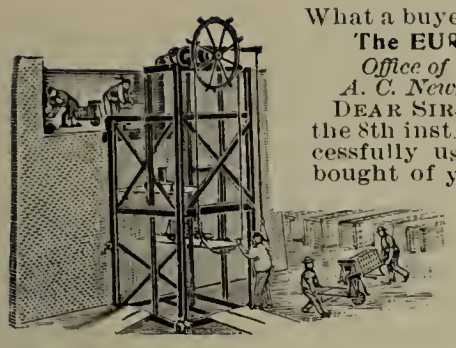
W. B. MERSHON & CO.,
Saginaw. East Side Mich.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.



What a buyer in 1890 says to-day of
The EUREKA BRICK ELEVATOR

Office of the Buffalo Brick Association,
A. C. Newton, Patentee, Crescent, N. Y.

DEAR SIR—Replying to your inquiry of the 8th inst., this Association is still successfully using the two brick elevators bought of you in 1890. They are useful and practical machines, and the long and hard use of them by us shows that they are constructed in a very serviceable manner.

Very truly yours,
The Buffalo Brick Asso.
O. W. WAGER, Mgr

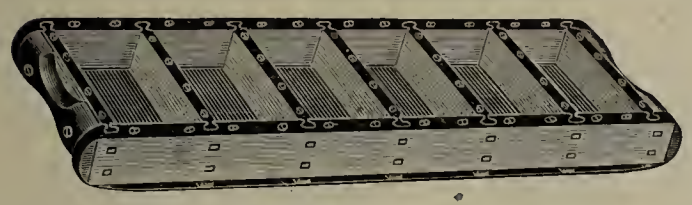
Write for particulars.

A. C. NEWTON, Manufacturer, Crescent, N. Y.

HARDIN & GRAY,

MANUFACTURERS OF

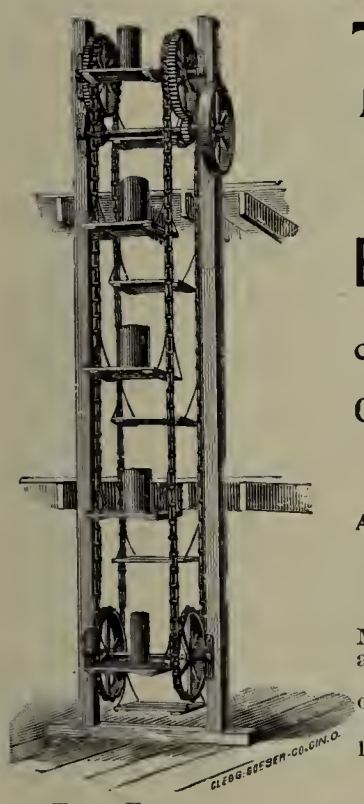
BRICK MOULDS



Of every kind and description. We make a specialty of Brick Moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.

Don't fail to get our prices. (Telephone 1084.) **1510 W. Washington St., Indianapolis.**



TILE ELEVATOR.

The Jeffrey Manufacturing Co.,

Columbus, Ohio, U. S. A.

ELEVATING--CONVEYING MACHINERY.

CONVEYORS FOR HANDLING
Green Tile,
Brick,
Sewer Pipe,
And Packages of all Description.

Chains, Standard and Special,
Sprocket Wheels,
Elevator Buckets. Elevator Boots,
Shafting, Cable Conveyors,
Hangers, Apron Conveyors,
Pulleys, Spiral Conveyors.

We make Elevators, Conveyors, Carriers, Power Transmission Machinery and all sorts of Labor Saving, Profit-producing appliances for use in and around Tile Mills, Brickyards, etc., etc.

We also submit designs and build machinery to meet special requirements in the lines named above.

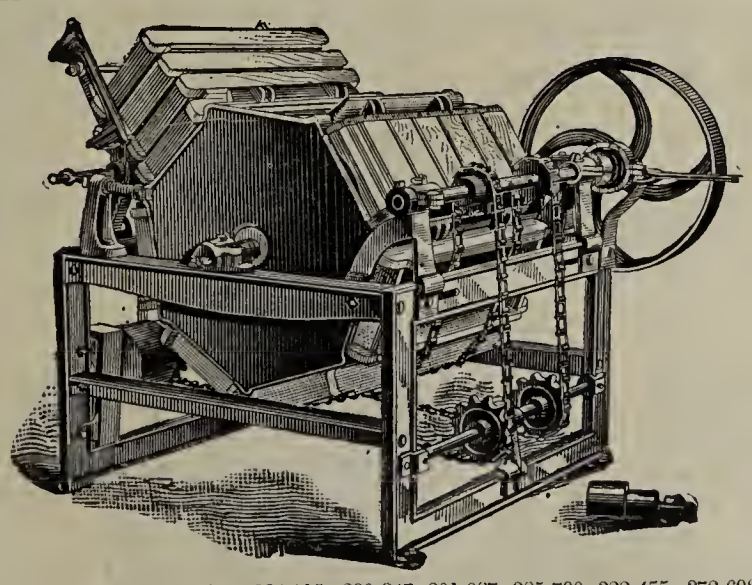
Write to us for estimates, before placing your order. We can probably save you some money.

SEND FOR CATALOGUE.

NEW YORK OFFICE, 41 Dey Street.

CHAMPION Brick Mould

SANDING MACHINES.



No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.

We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been successful. A suit is now pending against the Brookway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent. CINCINNATI, OHIO
H. W. FULLER, Gen'l Pass. Agent, WASHINGTON, D. C.

The VANDALIA LINE

The Short Line for St Louis and the West.

Leave Indianapolis.	Arrive at Terre Haute	Arrive St. Louis
No. 15 7:25 am,	9:55 am	5:00 pm
No. 5 7:15 am	9:10 am	1:45 pm
No. 21 12:35 pm	2:37 pm	7:12 pm
No. 11 7:05 pm	9:05 pm	1:44 am
No. 7 11:20 pm	1:25 am	7:00 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No. 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.

All trains carry first-class coaches
12:40 Noon train has Dining Cars for St. Louis
11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent,
E. A FORD, G. P. A. Indianapolis, Ind.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 2:30 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 11:55 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY

Lv Indianapolis, 3:40 am, 8:05 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address
W. W RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY,
Industrial Agt., St. Louis, Mo.

or

E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between CINCINNATI and INDIANAPOLIS, DECATUR, SPRINGFIELD, JACKSONVILLE, HANNIBAL and QUINCY.

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	4.05 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

Solid Train Between

Sandusky and Peoria

—AND—

INDIANAPOLIS and MICHIGAN CITY,

FT. WAYNE and CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger	7:00 a. m.
*No. 22 Passenger	1:20 p. m.
No. 24 Passenger	7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger	10:20 a. m.
No. 23 Passenger	2:50 p. m.
No. 25 Passenger	6:20 p. m.

*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent, Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.,
INDIANAPOLIS, IND.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

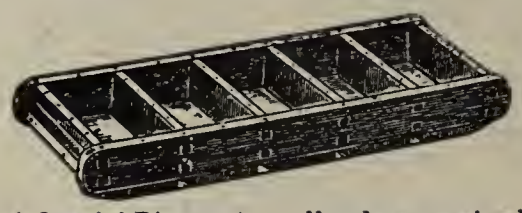
For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**



We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.

Increases grinding capacity.

Gives a finer grade of clay

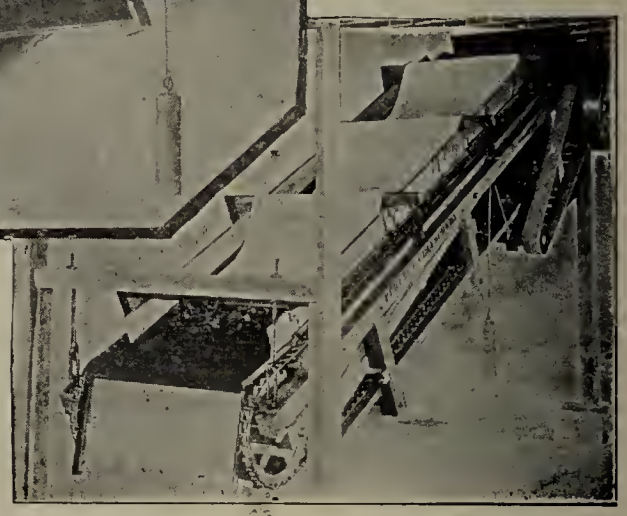
Does the work as well in cold weather as in warm.

Screens cold moist clay as well as dry.

It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush

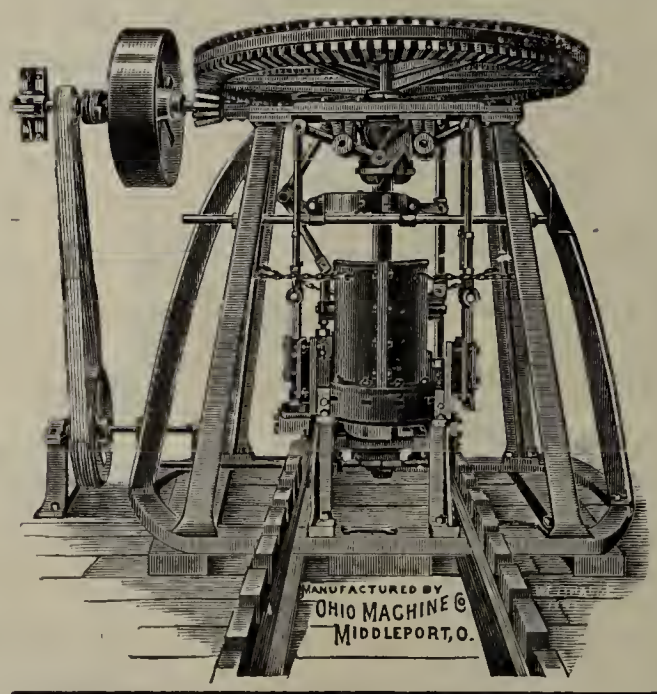
HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

The AJAX BRICK MACHINE,



MANUFACTURED BY THE

Ohio Machine Co.,

MIDDLEPORT, OHIO.

The well known and high class street pavers and building brick coming from the Ohio Valley are made on this machine, the above Company have several machines ready for shipment, and are prepared to place a machine with responsible parties on very easy terms, parties interested can send a few barrels of clay to the makers (freight prepaid), they will be pleased to make samples and ship green and burned brick for inspection, the machine is POSITIVELY guaranteed, and intending purchasers will do well to write the Ohio Machine Company for particulars.

COLUMBIA, MO.--A New Location for Fire Clay Manufacturing.

Population 6,000; two railroad systems (M., K. & T. and Wabash); midway between St. Louis and Kansas City; abundance of hardwood, also of elm and cottonwood; inexhaustible coal fields; choice building stone; **great fields of fire clay**; seat of University of Missouri, tuition free; also two large female colleges and other schools; sixty miles of gravel roads; healthful and prosperous; excellent location for manufacturing products sold to the people of the growing southwest. Address **SECRETARY, Box 234, Columbia Improvement Club, Columbia, Mo.**

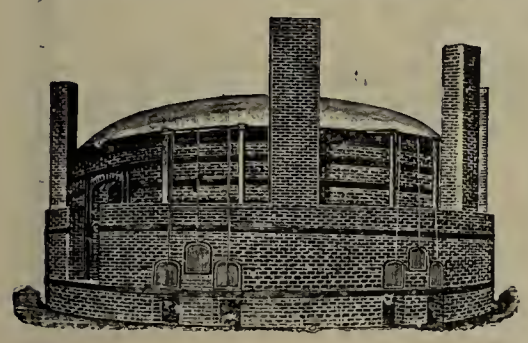
MORRISON'S LATEST IMPROVED KILN

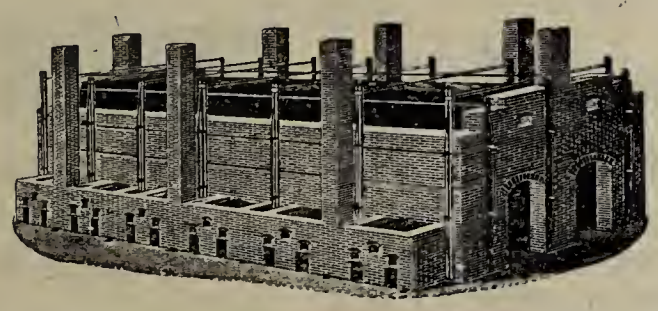
FOR BURNING BUILDING BRICK.

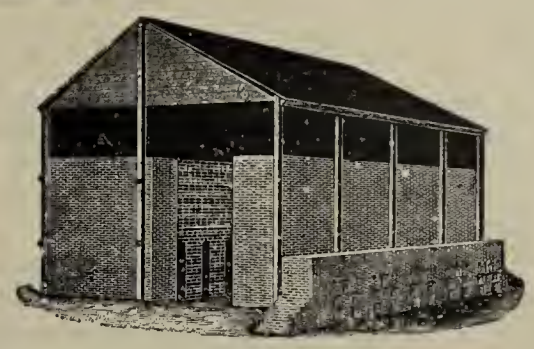
It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object. Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO., P. O. Box 335, Rome, Ga., U. S. A.

The THREE KINGS.

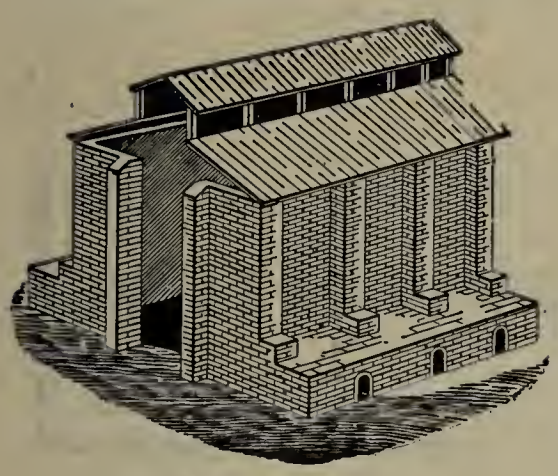






SWIFT SLACK COKING TABLE FURNACE KILNS. Over 700 old kilns changed and many new ones built in the past year. Send for Catalogue and Price List of Plans and Specifications.

F. E. SWIFT, Washington, Iowa. U. S. A.

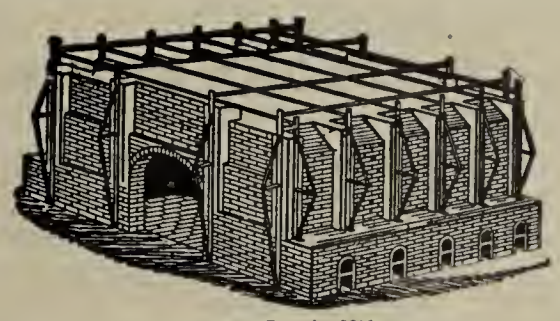


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, 2,422 Chestnut St., ***Kansas City, Mo.***

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades. Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE: 204 S., A. & K. BUILDING. SYRACUSE, N. Y.

W. C. SIBLEY, Pres. J. W. SIBLEY, Treas.

THE COALDALE BRICK AND TILE CO.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

COALDALE VITRIFIED PAVERS,

Represent the Highest Standa d of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

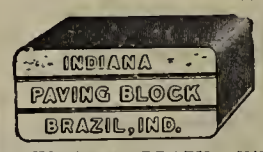
Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT, COALDALE, ALA.
TELEGRAPH OFFICE, WARRIOR, ALA.

BRANCH OFFICES BIRMINGHAM, ALA., MONTGOMERY, ALA., NEW ORLEANS, LA.

INDIANA PAVING BRICK AND BLOCK CO.

W. W. WINSLOW, Proprietor.



Street Paving Brick and Block.

TELEPHONE 1190.

OFFICE: 1 HUBBARD BLOCK, INDIANAPOLIS, IND.

Works at BRAZIL, INDIANA.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

R. D. CULVER, Pres. and Gen'l Man. I. G. POSTON, Sec'y and Treas.

The Wabash Clay Co.,

MANUFACTURERS OF ALL SHALE

PAVING BRICKS AND BLOCKS.

Our leading brands are POSTON BLOCK, WABASH STANDARDS, "SPECIALS," for crossings on macadam streets, GUTTER BLOCKS and COLUMBIAN SIDEWALK BRICK.

Our material has for years successfully stood the heaviest traffic of Indianapolis, Terre Haute, East St. Louis and dozens of other large cities of Indiana and Illinois. We ask investigation and comparison by those seeking the best paving material. Samples furnished on application.

Office and Works at VEEDERSBURG, IND.

Preston Brick Co.,

MANUFACTURERS OF

Vitrified Shale Paving Brick,

SEWER AND HARD BUILDING BRICK.

Hornellsville, N. Y.

T. B. McAVOY, PRESIDENT. FRANK B. McAVOY, SEC. AND TREAS.

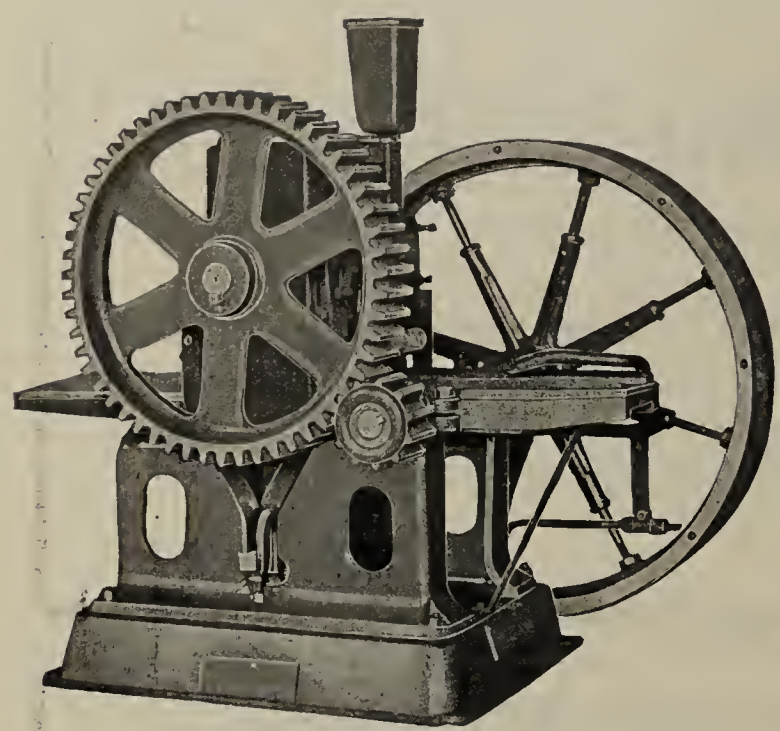
McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA. WORKS:—PERKIOMEN JUNCTION, PENN.



The Steele Repress,

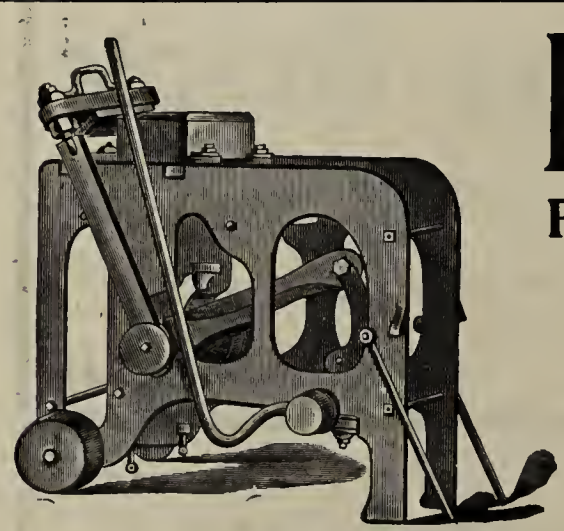
Price $185.00.

This is a very compact, strong and easily operated Press designed for the large number of yards which have more or less local demand for repressed brick which they are now filling with Hand Presses.

The compactness of this machine makes it almost impossible to break it, at the same time reducing the cost to very little more than hand press. A number of them have been in operation the past season giving perfect satisfaction.

Williamsport, Md., Dec. 23, 1899.
Messrs J. C. STEELE & SONS, Statesville, N. C.
Dear Sirs: We want you to ship us another of your Power Repress Machines, same size die as the one we got from you last spring, which works very well and satisfactorily. Your Repress Machines are a decided success, as the work of ours proves. Yours very truly,
VICTOR CUSHWA & SONS.

J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**

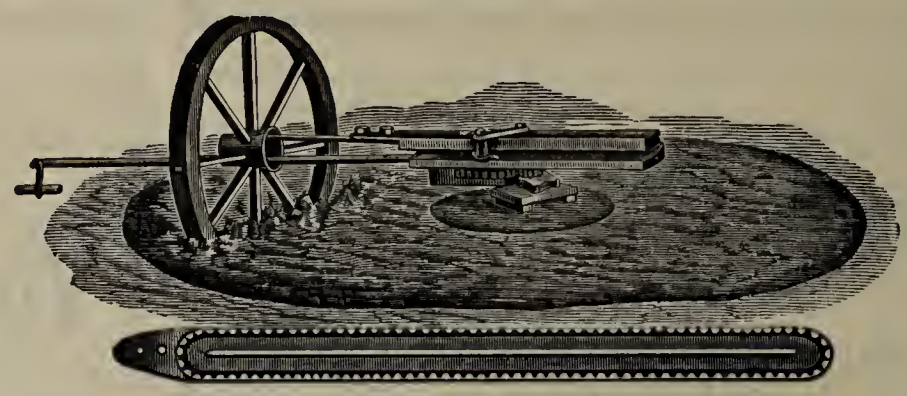


RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. che per.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

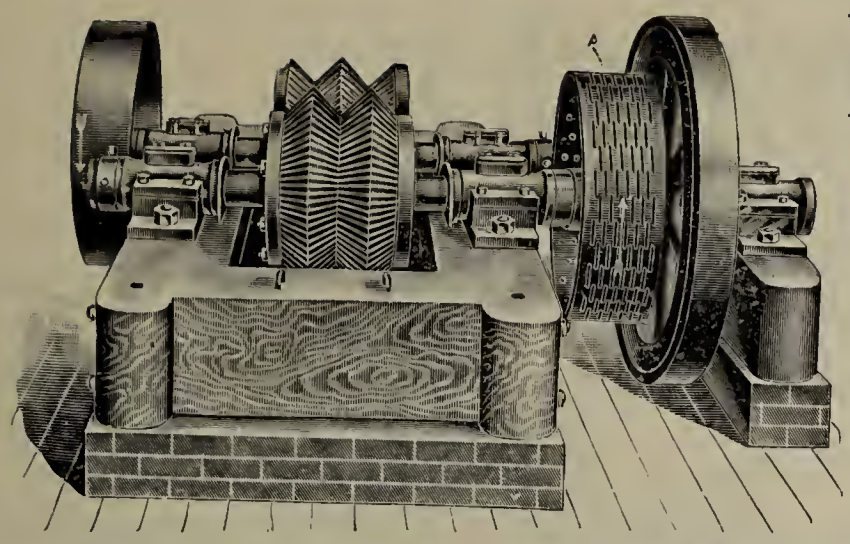
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



NEWELL CRUSHER.

Successfully crushes any and all kinds of Clays, preparing same for Brick, Tile or Terra Cotta. Fully guaranteed. Fast shaft fitted with Para Pneumatic Pulleys, increasing power of the belt, and efficiency of the crusher.

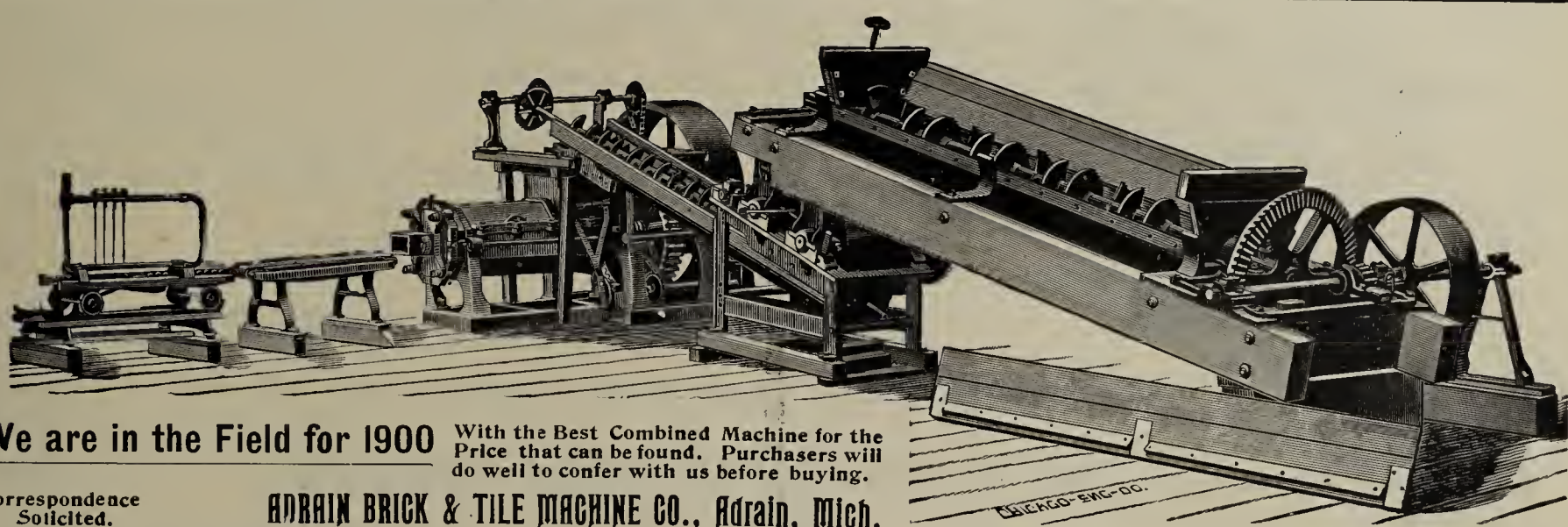
Also we equip these machines with Improved Elastic Roller Bearings when desired. These bearings greatly reduce friction thereby saving power in operating, and insuring an always cool journal.

Our Crushers will do the work where others fail. Prices reduced Quality maintained.

Extract from a recent letter from the Frontier Brick Works, Niagara Falls, N. Y., "THE CRUSHER RUNS FINELY, AND IS ENTIRELY SATISFACTORY."

Write us for price and particulars, stating capacity wanted.

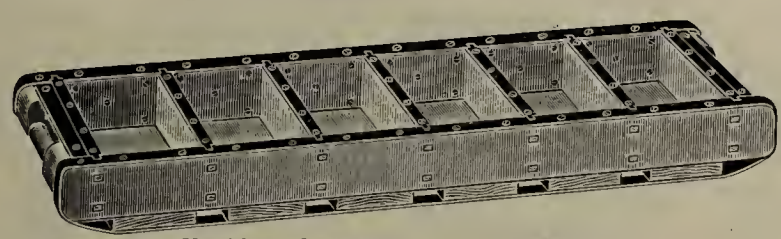
DUPLEX HEATING & MACHINE CO. L'td. Successsors to Newell Universal Mill Co. 534 West 22d. St., NEW YORK.



We are in the Field for 1900 With the Best Combined Machine for the Price that can be found. Purchasers will do well to confer with us before buying.

Correspondence Solicited.

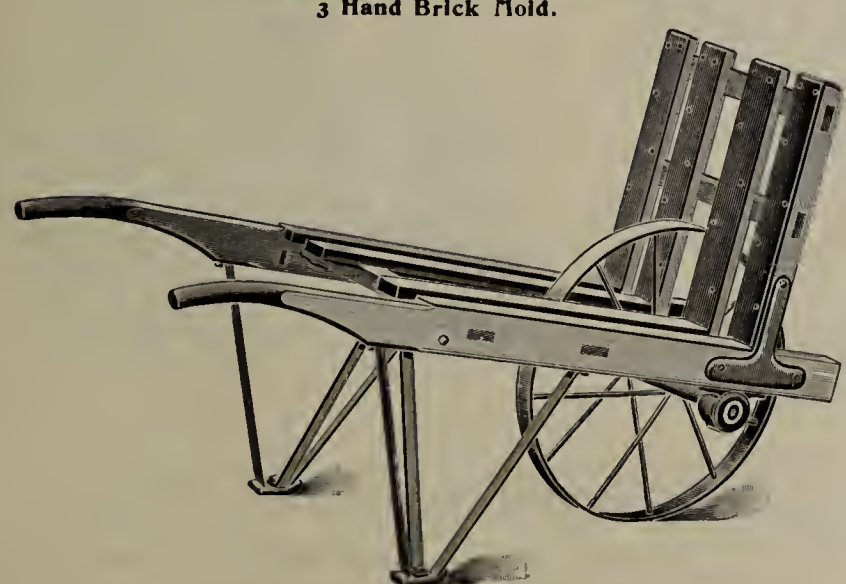
ADRAIN BRICK & TILE MACHINE CO., Adrain, Mich.



Machine, Five and Six Brick Mold.

6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

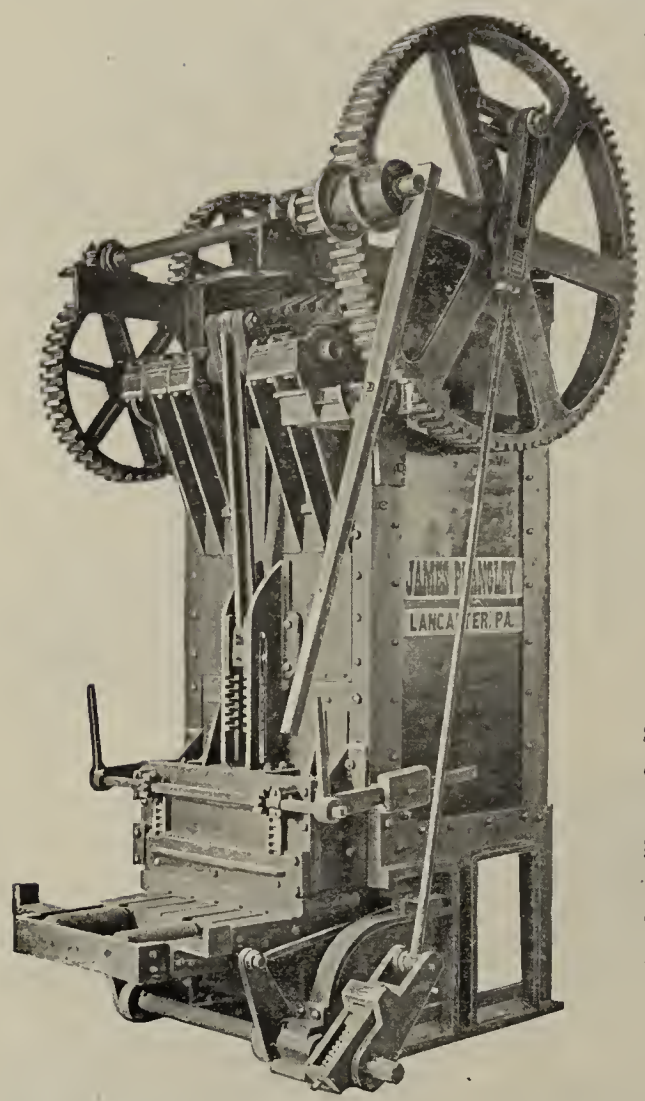
BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

D. J. C. ARNOLD,

New London, O.



The Prangley Brick Machine.

BUILT TO LAST A LIFE TIME.

Large Capacity. Molds Brick Very Stiff. Pug-Mill Not a Necessity, Will Work Clay Direct From Bank.

This Machine is constructed on practical lines by Mr. James Prangley, a successful brickmaker of thirty years experience. The tempering knives are of solid steel, and the press box is lined with steel, making it the most durable machine on the market. Brickmakers who buy the Prangley Machine will get their money's worth.

We now have ready the **PRANGLEY SANDER.** Positively no wear on molds. No waste sand. No time lost in getting molds to machine. It never misses a turn, and it has no apron to wear out.

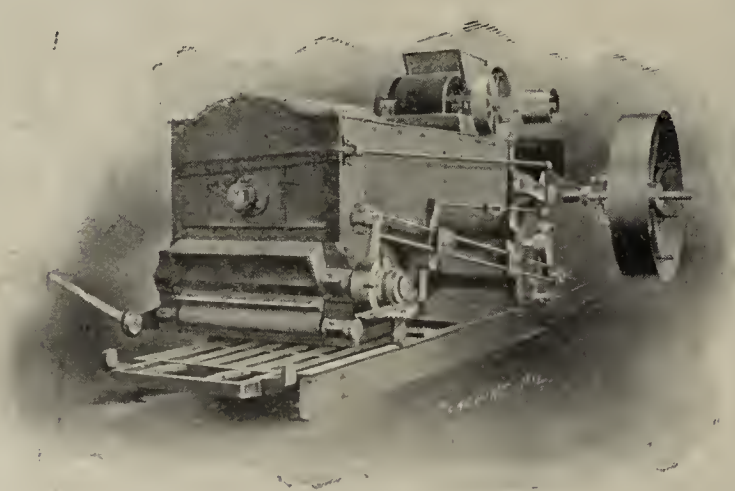
Manufactured by

JAMES PRANGLEY,

Office 666 West Chestnut St.,

LANCASTER, PA.

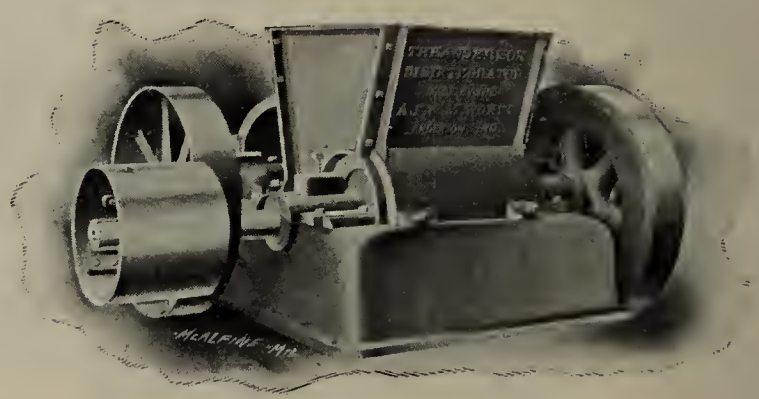
Write for Prices, etc., to
EDWARD C. HUHN,
Sole Selling Agent, 1215 Filbert St., Philadelphia.



Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



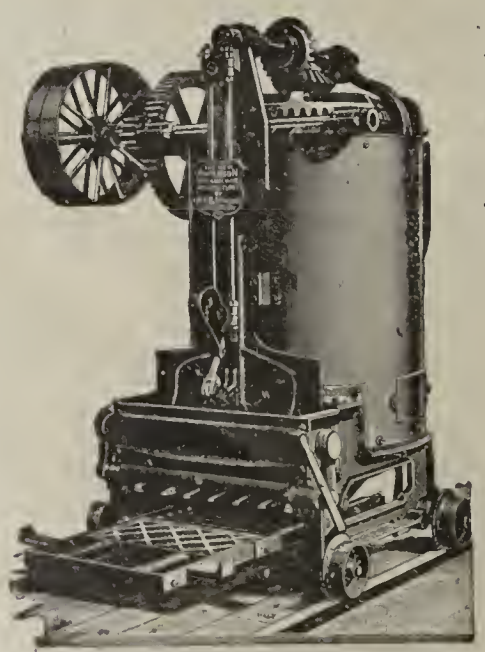
Best Disintegrator on the Market.

MANUFACTURERS OF . . . .

New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.



Steel and Iron Upright Stock Brick Machine.

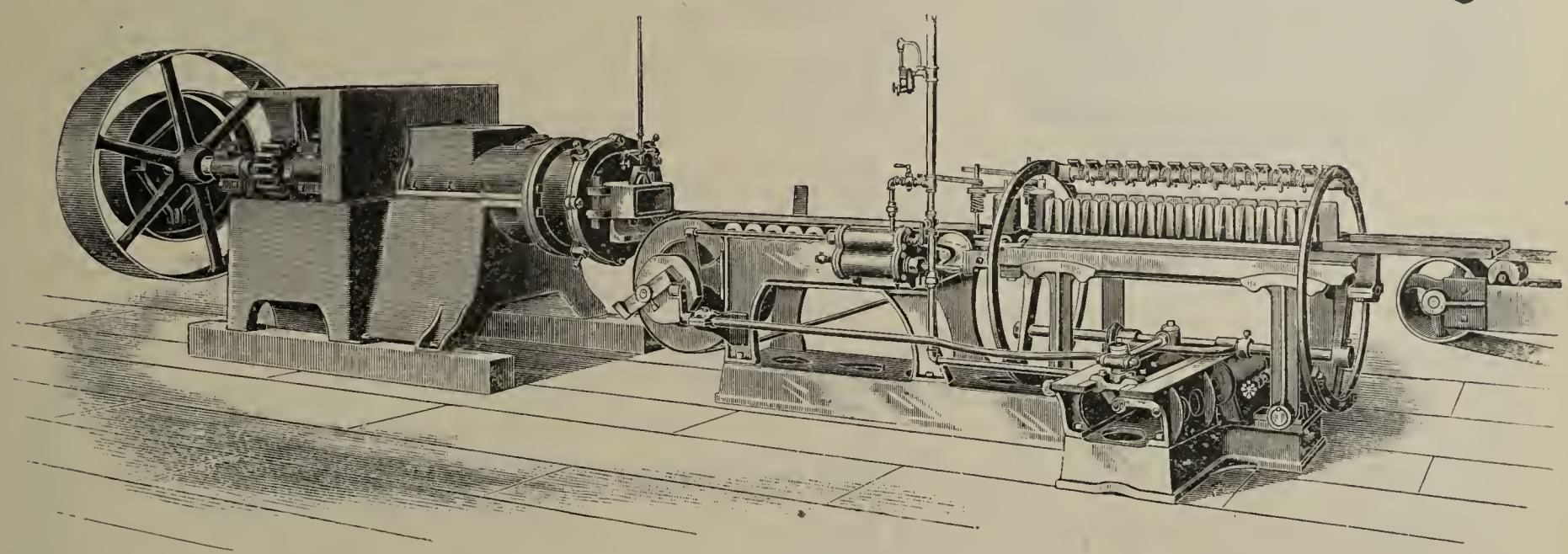
1899 Horse Power Machine.

The Anderson Foundry and Machine Works,
Anderson, Ind.

You Obtain More for Your Money

(When Purchasing)
(While Using)

Leader Machinery

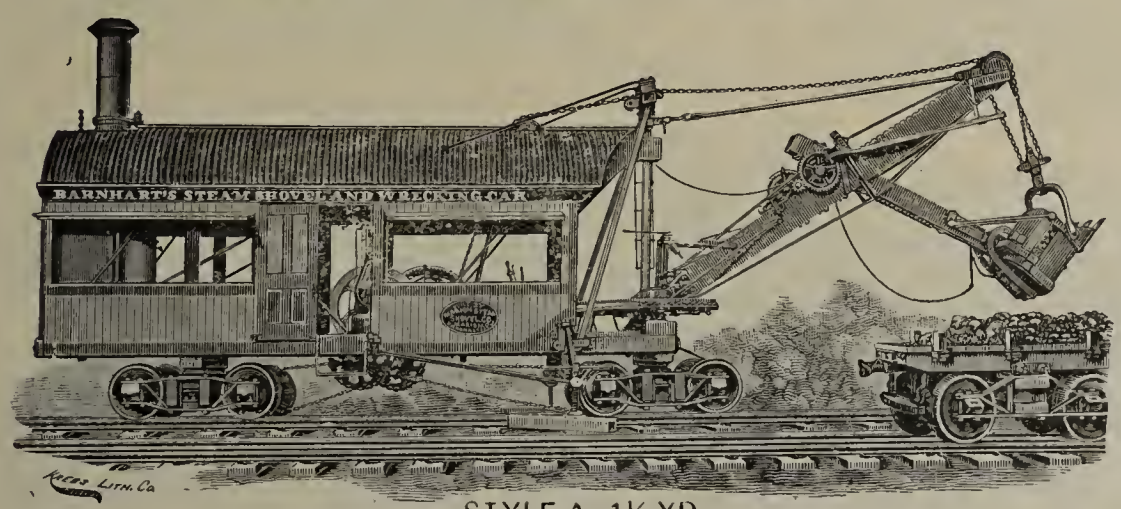


Leader No. 25 with Side Cut Die and Automatic Cutter.

LEADER MACHINES are most economical because they are properly designed and well built. They do good work with least waste. Printed matter illustrating and describing **Leader Brick Machines, Pug Mills, Crushers, Presses,** etc., free.

LEADER MANUFACTURING CO., Decatur, Ill.

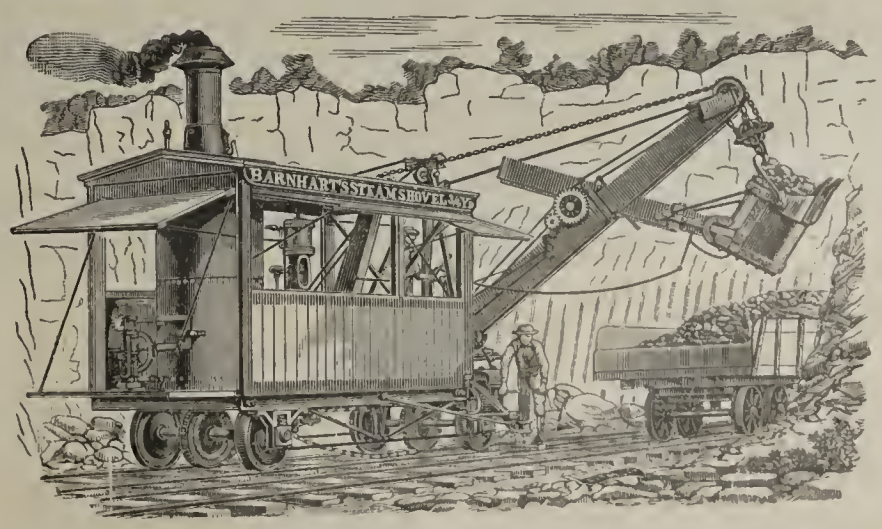
Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.



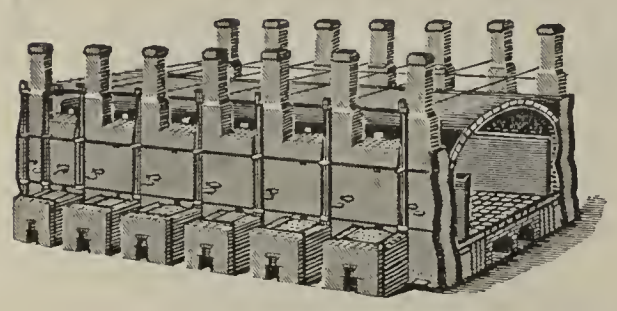
STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Oaks, Pa., January 26, 1900.

M. M. BUSHONG, Phoenixville, Pa.

Dear Sir:—Your letter of inquiry of the 25th inst, in regard to kiln received; in reply will say it gives us great pleasure to say that your kiln is doing splendid work, we have made eleven (11) burns and they were all a great success, in fact it surpassed our expectations in every particular, both to quality of paving brick produced and the amount of coal consumed and we contribute its success to the perfect system of drafts and absolute control of same. In other words if your kiln does not burn evenly from top to bottom or wall to wall it is the fault of the man in charge and not the kiln.

We have had a wide experience in the kiln line and do not hesitate to say that your kiln is the best for burning Shale Paving Brick to be found.

We can assure you that in the future should we build more kilns they will be the **Bushong Down Draft.** Wishing you success we remain,

Yours respectfully,
PERKIOMEN BRICK CO.,
Per HAGGINBOTHAM, Supt.

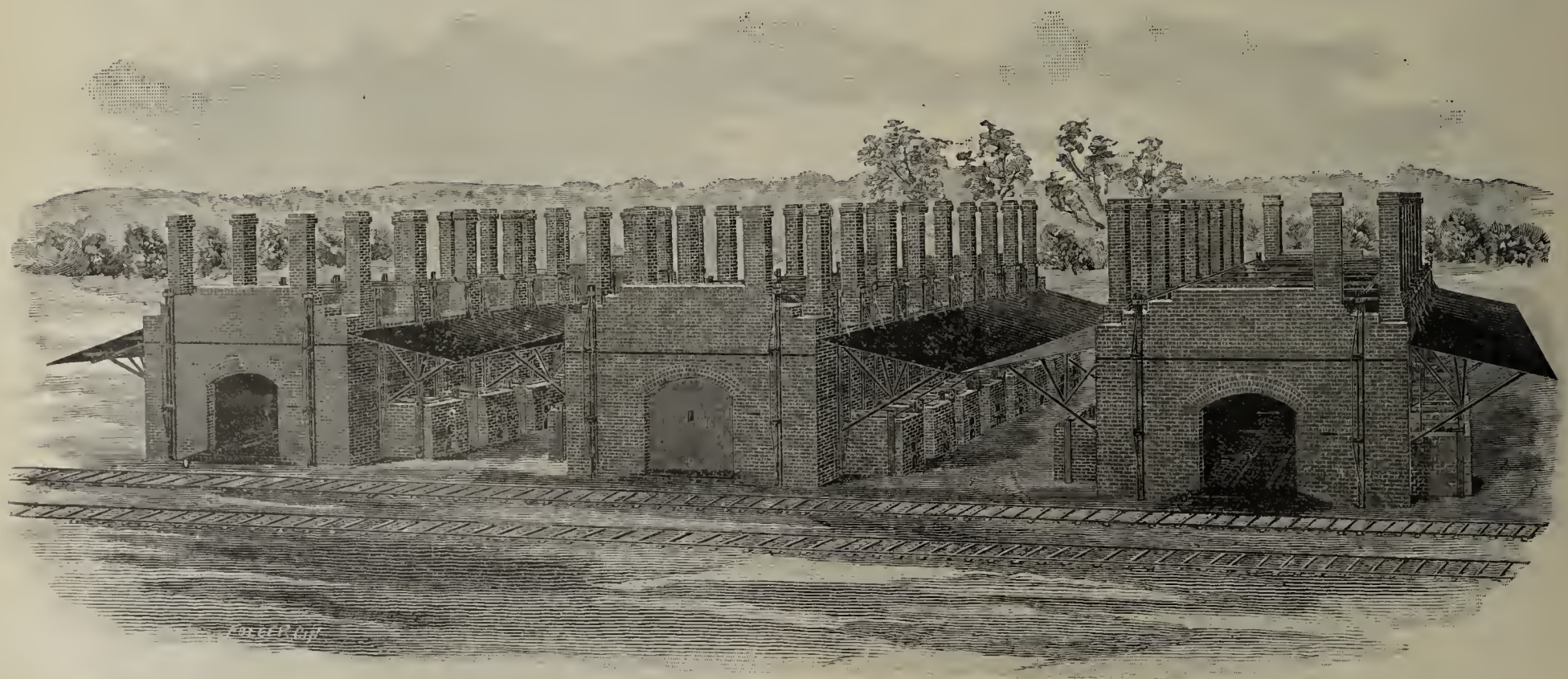
BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.



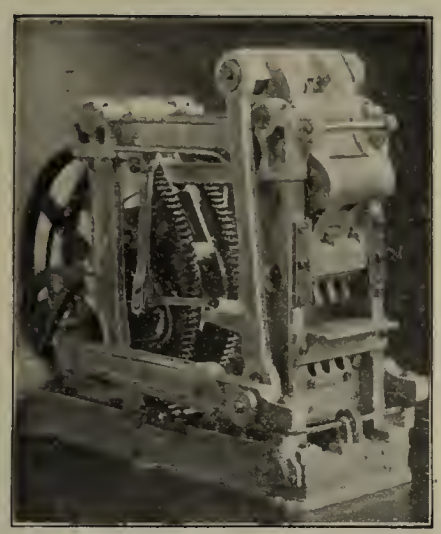
These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

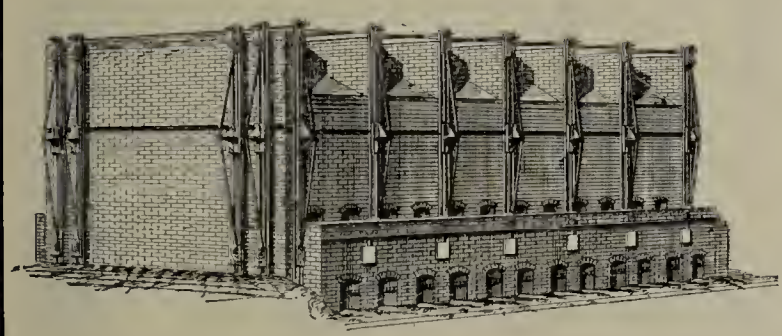


The GRATH DRY CLAY BRICK PRESS.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

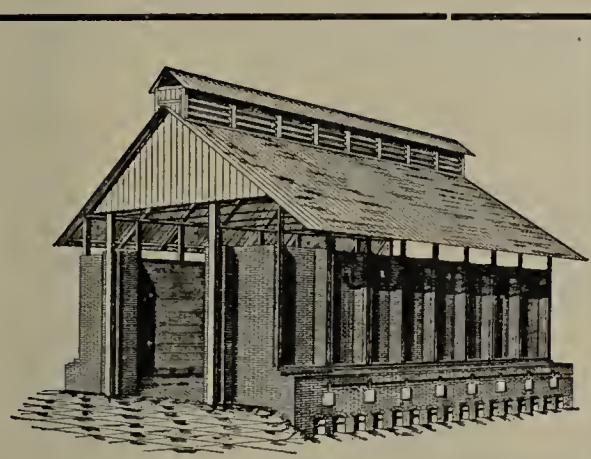
Features:

1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Requires less power to Operate.
5th. Brick free from Granulation.
6th. All Bearings Bushed.
7th. All parts Accessible.
8th. Thickness of Brick Changed without Stopping.
9th Master Wheels Close to Bearings.
10th. No Working parts under Lower Cross Head.



The GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning fine Face Brick, Fire Brick, Sewer Pipe, Tile, Pottery, etc. PERFECT RESULTS with nothing but Slack Coal or Screenings.

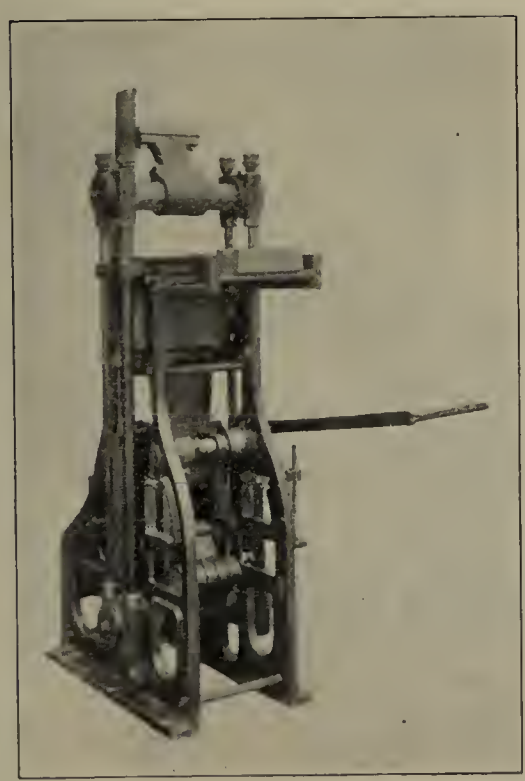


The Grath Up-Draft Kiln.

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with slack coal, with better results than lump coal in ordinary Furnaces and without any black Smoke.

The Grath Gas and Coking Furnaces

Can be attached to ALL kinds of Kilns, either old or new, and produce better results with SLACK than lump coal in ordinary furnaces. PROTECTION GUARANTEED TO ALL USERS. WILL PROSECUTE ALL INFRINGEMENTS.



The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK. The only successful Press of its kind in the market.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

The Coffeyville Vitrified Brick and Tile Co.

MANUFACTURERS OF

Repressed Vitrified Paving, Building and Face Brick and Drain Tile

Plants at Coffeyville, Cherryville and Independence, Kan. Daily Capacity 325,000

W. P. GRATH, Pres., Coffeyville, Kansas, April 30, 1900.

The ILLINOIS SUPPLY & CON. CO., ST. LOUIS, MO.

DEAR SIR—Replying to your favor of the 24th inst., we are very much pleased to state that the Hand Power Press which we purchased from you is giving perfect satisfaction, and is making a very fine grade of ornamental brick, with less than half of the expense and more than double the capacity of the screw press.

Wishing you success in the sale of this machine, we are

Yours very truly, THE COFFEYVILLE VITRIFIED BRICK & TILE CO.

Per W. H. MAHAN, Gen'l Mngr.

For Further Information and Catalogue on Above, address

The Illinois Supply & Construction Co., ST. LOUIS, MO., U. S. A.

Mention The CLAY-WORKER.

BEHOLD!

Is it not Written?

If Ye Have Aught to Do

DO IT.

You Know

Hot Air Is necessary for the drying of brick

Why Not Heat the **Air** instead of heating water to make Steam, and then attempting to radiate the heat from several miles of steam pipe?

Others are saving **$15.00 per day** by the use of our **Buckeye Dryer,**

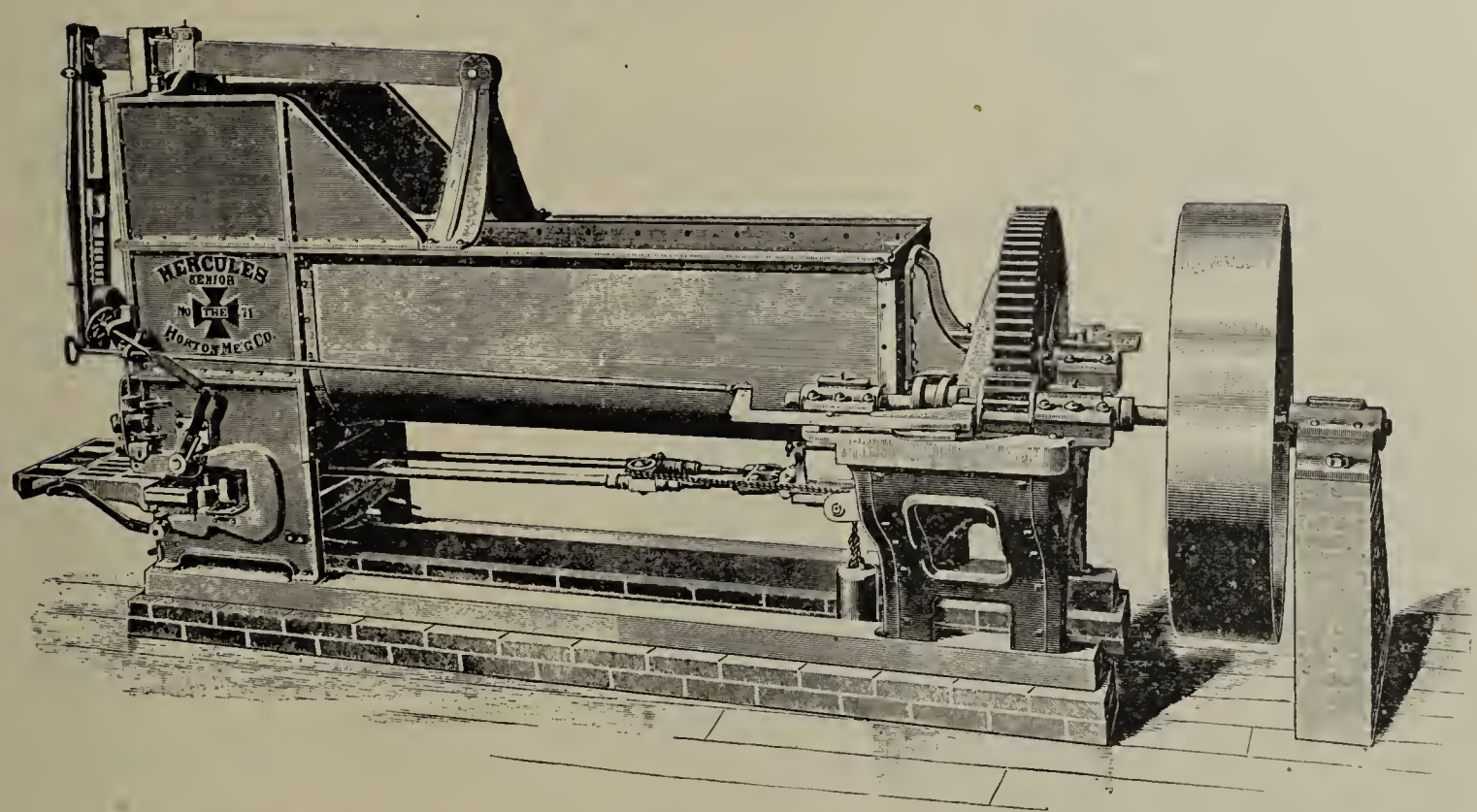
Why Not You.

Write Us and we will do the **Rest.**

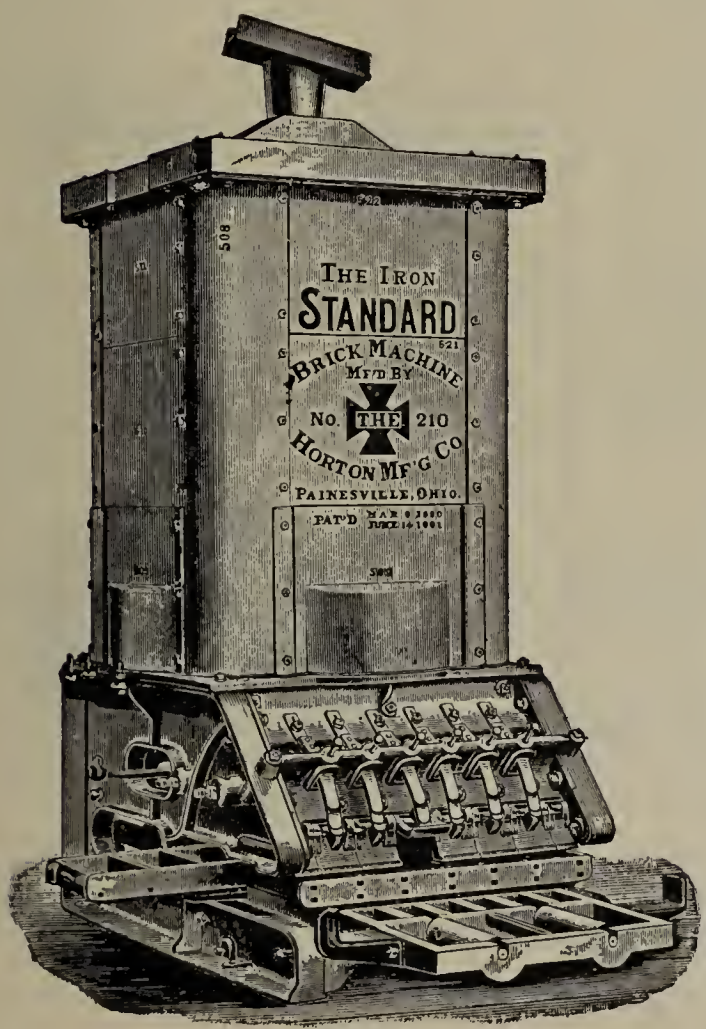
The CLEVELAND CAR CO.,
CLEVELAND, OHIO.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES



IRON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brick-yard Supplies.

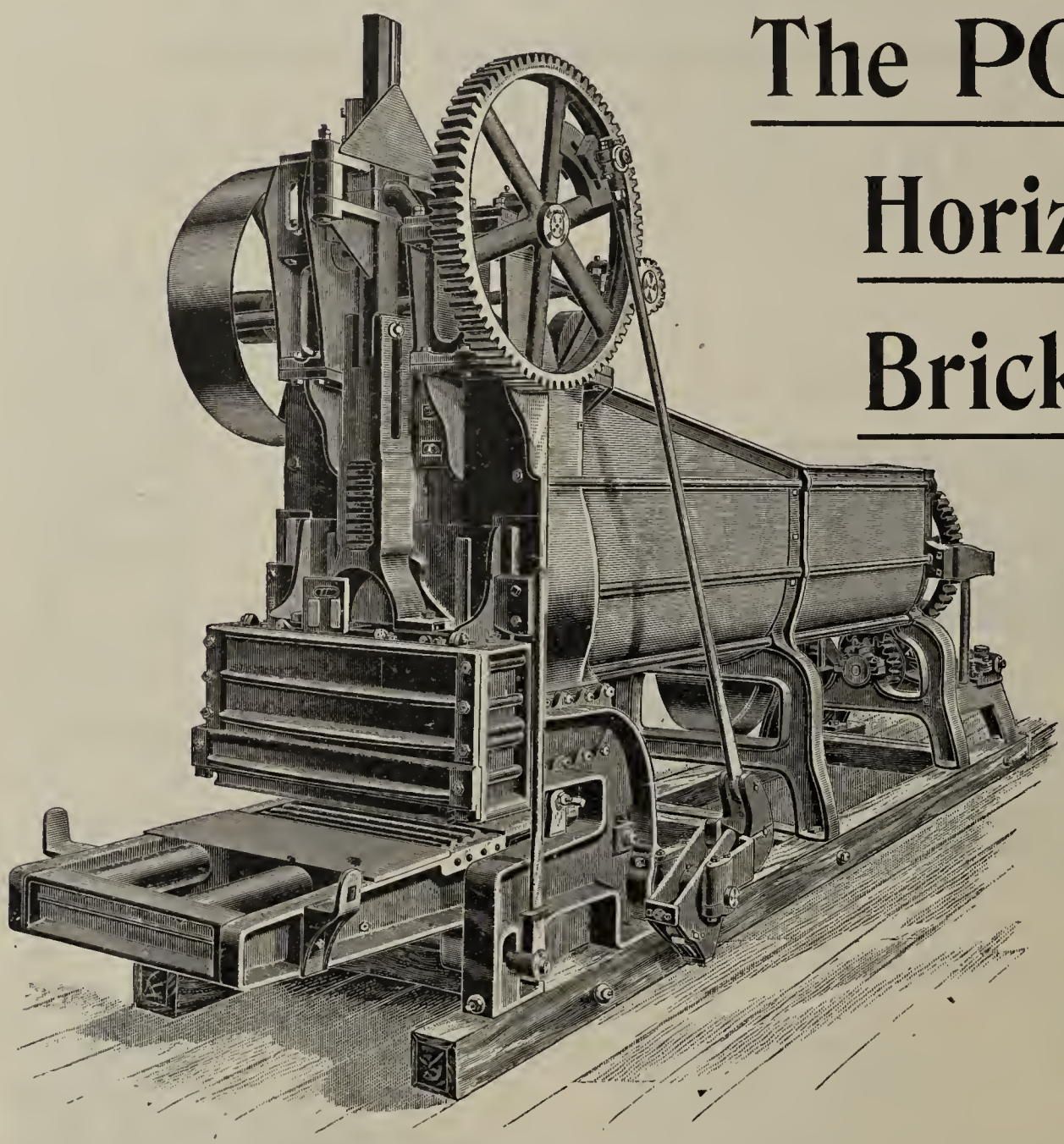
The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

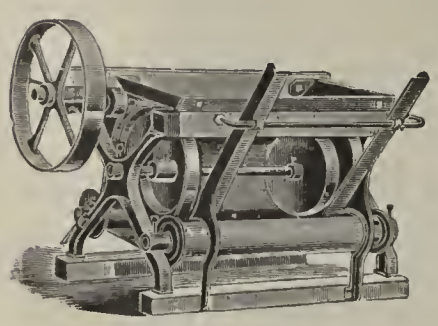
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

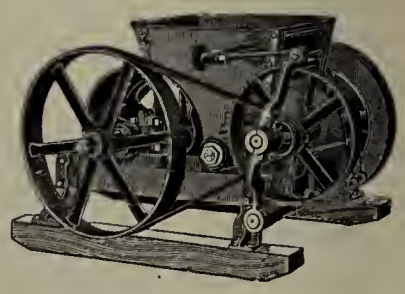
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



DISINTEGRATORS.

When in need of Machinery or supplies, we can save you money.

C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

Some Interesting Reading

As well as Fair Warning to All.

The Patents Owned by

C. & A. Potts & Co.,

Are declared Valid by The Highest Courts in Our Land.

Don't take chances of Purchasing other so-called Disintegrators, you are Liable to get into Trouble. You take no risk when Purchasing a POTTS. Neither of Infringements Suits or quality. They are The best on EARTH.

UNITED STATES CIRCUIT COURT,
Southern District of Ohio, Western Division.

C. AND A. POTTS AND CO.,
vs.
FRANK F. CREAGER,
HARRY M CREAGER and
JONATHAN CREAGER.
No. 4,244.
In Equity.

PERPETUAL INJUNCTION.

THE PRESIDENT OF THE UNITED STATES OF AMERICA
TO
Frank F. Creager, Harry M. Creager and Jonathan Creager, their clerks, attorneys, servants, agents and workmen, and any and all persons acting by, through or under the authority of said defendants or either of them.

WHEREAS, it has been represented to us in the Circuit Court of the United States for the Southern District of Ohio, Western Division, on the part of C. and A. Potts and Co., complainant, that it has lately exhibited its Bill of Complaint against you, the said Frank F. Creager, Harry M. Creager and Jonathan Creager, defendants, to be relieved touching the matter therein complained of, in which Bill it is stated, among other things, that Letters Patent of the United States No. 322,393, for Improvements in Clay Disintegrators, were issued on July 14, 1885, in due form of law, to Clayton Potts and Albert Potts, and that said Letters Patent have been properly assigned to and are now owned by the said C. and A. Potts and Co., the complainant herein, and that you, the said Frank F. Creager, Harry M. Creager and Jonathan Creager, have infringed the rights secured by the aforesaid Letters Patent, by making and selling to others Clay Disintegrators embodying the invention set forth and claimed in the said Letters Patent, contrary to the form of the statutes in such cases made and provided, and that your said acts and doings in the premises are contrary to equity and good conscience.

Now, therefore, in consideration thereof, and of the particular matters in the said Bill set forth, you, the said Frank F. Creager, Harry M. Creager and Jonathan Creager, your clerks, agents, attorneys, servants and workmen, are strictly commanded and enjoined under the pains and penalties which may fall upon you, and each of you, in case of disobedience, that you forthwith, and **perpetually** hereafter until the expiration of said patent, absolutely desist and refrain from any further manufacture, sale or use in any manner of the patented improvements, or any part thereof, in violation of the rights of the said C. and A. Potts and Co. under the said Letters Patent of the United States No. 322,393.

Witness, the Honorable MELVILLE W. FULLER, Chief Justice of the Supreme Court of the United States, and the seal of the Circuit Court of the United States for the Southern District of Ohio, Western Division, this 27th day of March, A. D. 1900, and the one hundred and twenty-fourth year of the Independence of the United States of America.

B. R. COWEN,
Clerk.

[SEAL]

Received the writ at Cincinnati, Ohio, on the 28th day of March, 1900, and on the same day served the same on the within named Harry M. Creager and Frank F. Creager, by handing to each of them personally a true copy of this writ with all the endorsements thereon. And on the 30th day of March, 1900, I served the same on the within named Jonathan Creager by leaving a true copy of this writ with all the endorsements thereon at his usual place of residence, placing same in the hands of his wife.

V. J. FAGIN, U. S. Marshal S. D. O.
By W. J. Sanderson, Deputy.

Southern District of Ohio, } ss.
Western Division. }

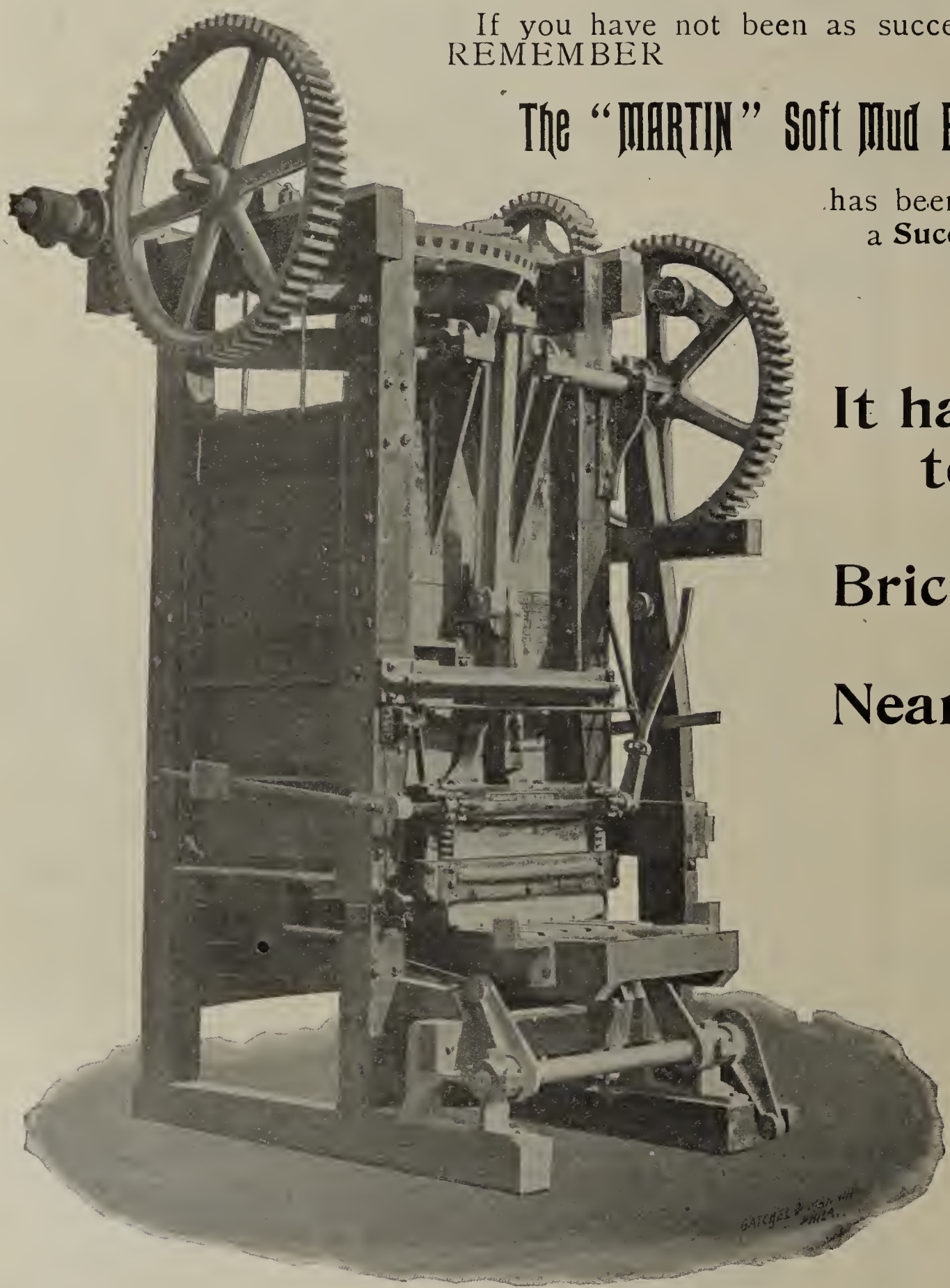
A true and correct copy of the original Perpetual Injunction on file in the Clerk's office of the United States Circuit Court at Cincinnati, Ohio.

Attest: B. R. COWEN, Clerk,
By Robt C. Georgi, Deputy.

MANUFACTURED ONLY BY

C. & A. POTTS & CO., = Indianapolis, Ind.

Start the New Year Right.



If you have not been as successful as many others REMEMBER

The "MARTIN" Soft Mud Brick Machinery

has been the making of many a **Successful Brickmaker.**

It has stood the test of Brickyard life for Nearly half a Century.

Up-to-Date Equipments are OUR Specialty.

We Furnish Everything a Brickmaker Needs.

Our new Catalogue contains much useful information.

THE HENRY MARTIN BRICK MACHINE MFG. CO., INCORPORATED.

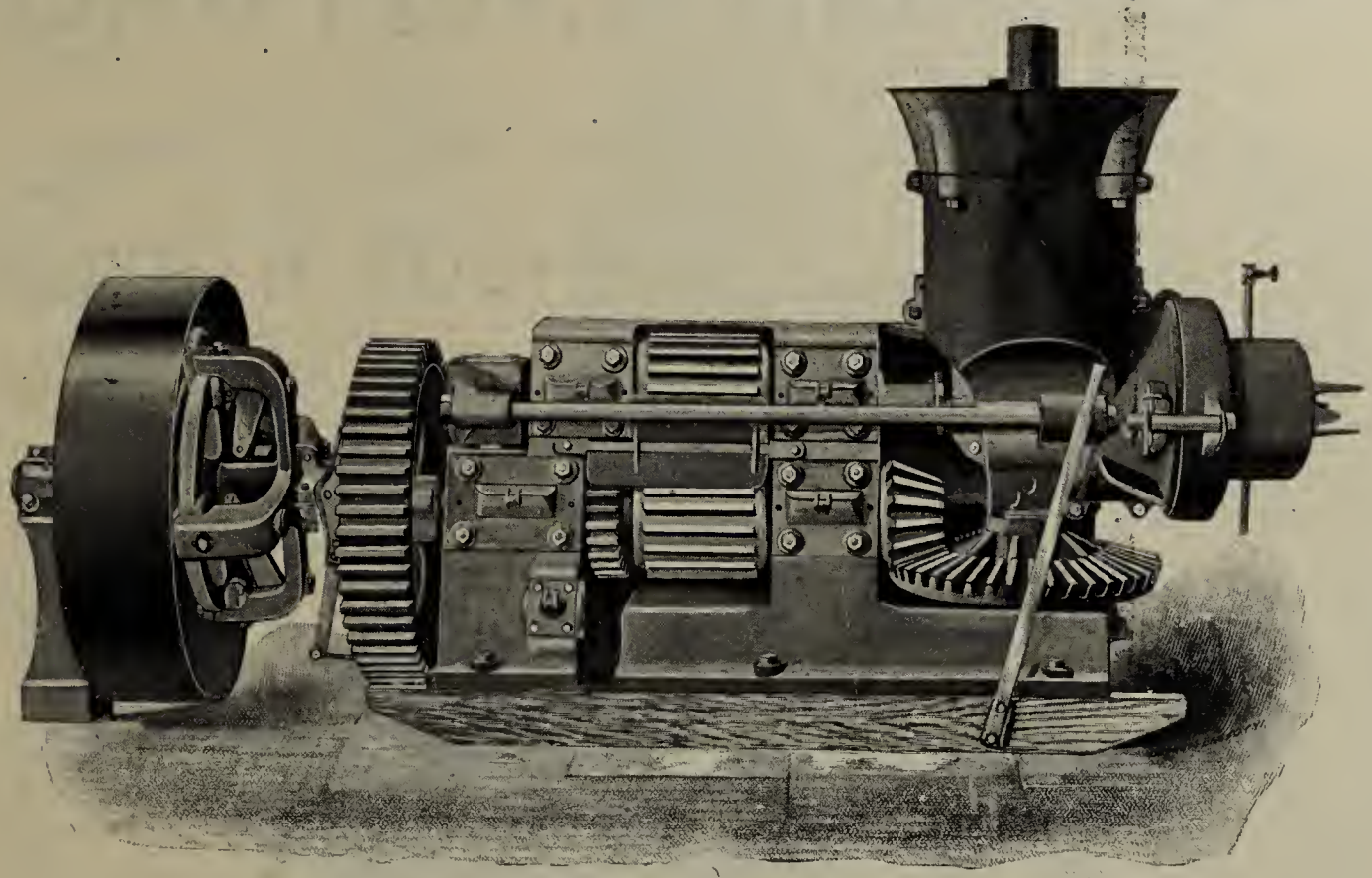
Sole Manufacturers of the "Martin" Patents,

LANCASTER, PENN., U. S. A.

Wonder Brick Machinery.

SOLD ON ITS MERITS.

SEND FOR CATALOGUE. **WRITE FOR PRICES.**



BIG WONDER BRICK MACHINE: Capacity 60,000 Brick Per Day.

BE PROGRESSIVE—There is nothing gained by staying in the back ground. Life is what we make it, and the enviornments have a great deal to do with the disposition.

Make life pleasant by having your surroundings up-to-date.

You can do this by buying a Wonder Machine.

The **WONDER** is no experiment, having been on the market some fiifteen years, and each year it is improved and brought up to the latest mechanical ideas.

The Wallace Mfg. Co.,

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

Frankfort,
Indiana.

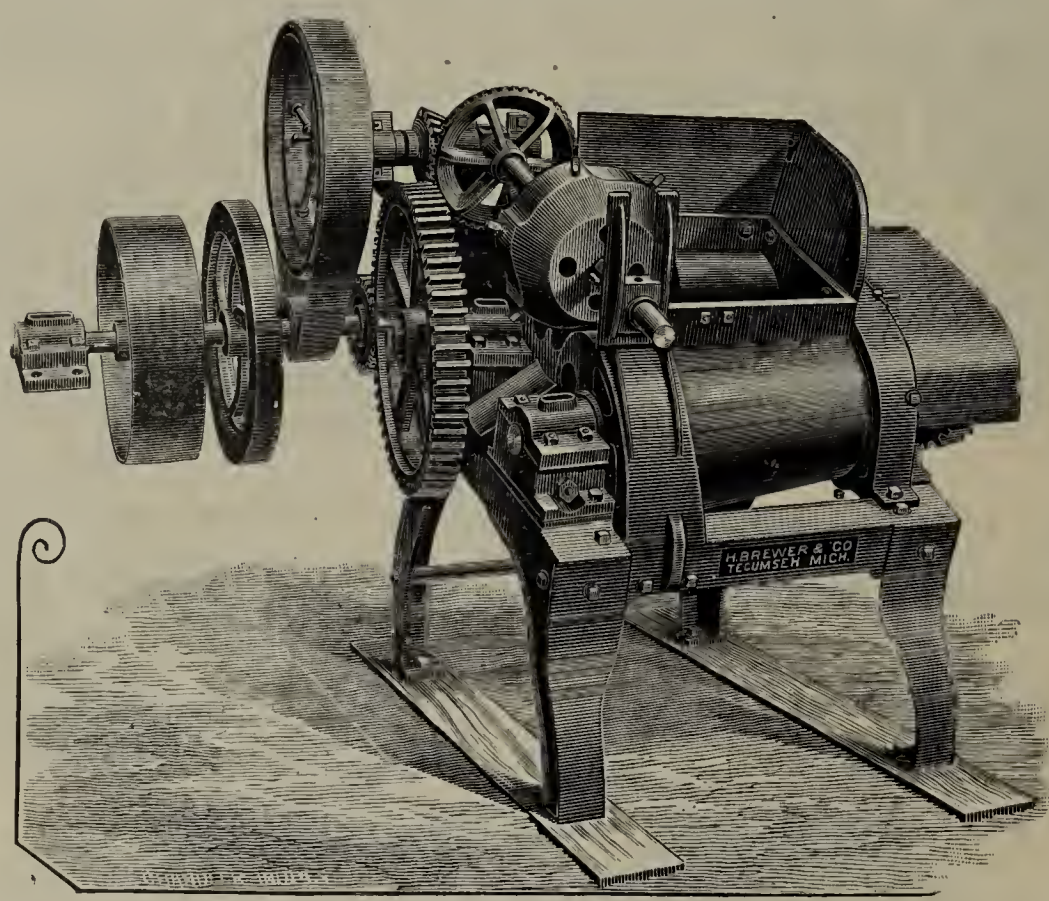
SOUTHERN AGENT: Frank H. Reid, Charlotte, N. C.

A Crusher that is Crushing Everywhere

ONE THAT HAS STOOD THE TEST OF TIME, AND IS TO-DAY

WITHOUT A RIVAL.

IT breaks up the Dry Lumps, Throws out the Stone and leaves the Clay in Proper Condition, not rolled into Hard Sheets.



No 1 STONE SEPARATING CLAY CRUSHER.

THE rolls are constructed of Chilled Iron and are as nearly proof against wear as it is possible for them to be Made. . .

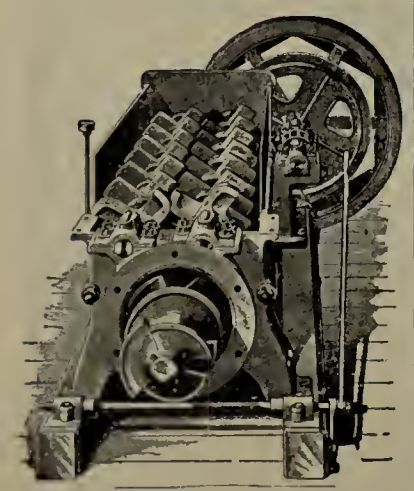
MANY ARE IN USE...

In all parts of the country and we can tell you where and by whom if you care to know.

H. BREWER & CO.,

TECUMSEH, MICH., U. S. A.

INTERIOR VIEW OF ABOVE MACHINE.



Ready for the Battle! Prepared for the Conflict! Eager for the Fray!

Strong, Steady, Hardy, Well Equipped. Disciplined to Perfect Behavior. Fearless. That's our **Premier.** Note the Interior arrangement. Pugging more than doubled. Capacity 75,000 brick per ten hours. Write to us for more points.

Manufacturers of

J. D. FATE & CO., "PLYMOUTH" BRICK and TILE MACHINES

BENSING'S AUTOMATIC TABLES and other Yard Supplies and Equipments.

PLYMOUTH, OHIO,

Richland Co. U. S. A.

Western Representative, B. E. LaDOW, 405 Chamber of Commerce, Chicago, Ill.

A CLEAN CUT.

Constantly changing conditions demand new ways. Here is the newest thing out, and it's away in advance of anything that has been or will be for some time to come.

Impossible to clog the bar of Clay.
Impossible to cut a Crooked Brick.
Impossible for Bricks to vary in size.
Impossible for cut to be Wrongly timed.
Impossible to find a Cutter equal to it.
Impossible to find a shorter wire.

IT IS the only automatic table with the shearing down cut. You may press your hand upon a sharp blade without danger but if you give the blade a drawing movement a deep clean cut is the result. This same principle insures clean cut brick with less strain upon the cutting wires.

The cutting machine being driven from both ends insures absolute rigidity and accuracy.

The wires are the shortest on any table. Moreover their shearing movement reduces the strain upon them fully a half. Should a wire break it can be replaced without an instants delay or without stopping the machine.

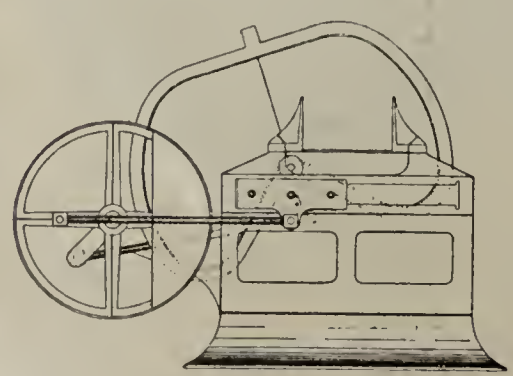
There is not a bolt, bar or screw put into the construction of this table that is not needed for its perfect work, nor is a single bolt or screw omitted that will assist in making it a perfect success. Simplicity is a feature but it is not allowed to interfere with successful operation.

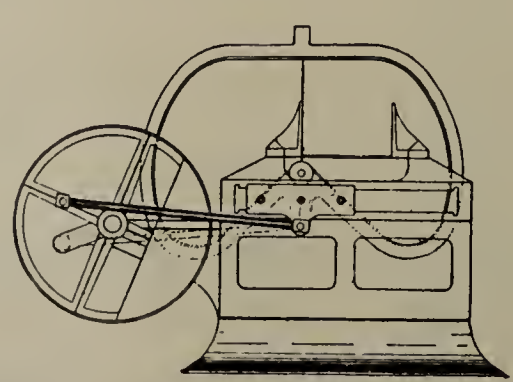
This table is just as much a machine to be proud of as though it were a "Eagle" Repress or Corliss engine. Every part is just as carefully made, every movement as positive and accurate, and as a whole it is just as sure of successful operation. In a word it is "Built Right and Runs Right."

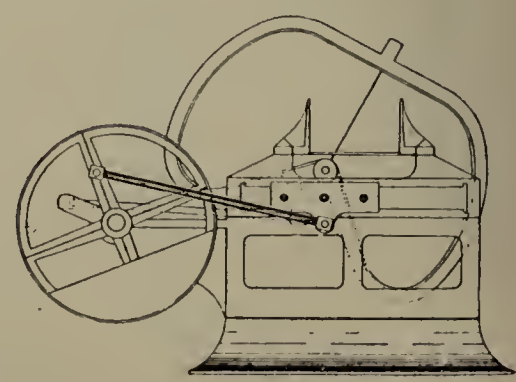
No "Merry=go=Round" or wire "bird cage" arrangement on this Cutter. It has the accuracy of an engine, with the same smoothness of operation.

The movement of the bar of clay, while not driving the table, acts as a complete governor over it and insures the accurate timing of the cut.

The Reel type of side cut table gives an abundant opportunity for lost motion which becomes greater and greater until no two brick are of the same thickness. Bricks made on this cutter to-day will be the same size as those made next year and there won't be a big repair bill either.


No. 1.


No. 2.

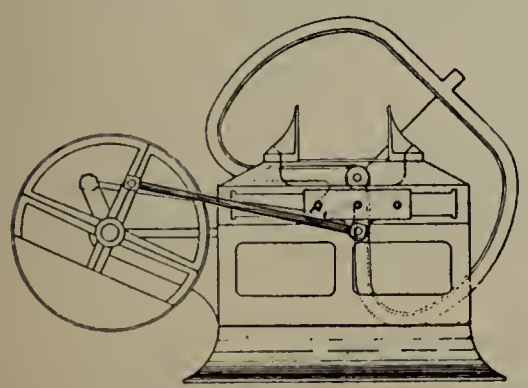

No. 3.

Automatic Oscillating Down Cut Table.

THE CUTTING TABLE has a reciprocating forward and backward movement, the wires always moving in a shearing downward direction. Just before entering the bar of clay the wires are tilted to a downward position, the slant or angle becoming greater and greater as the cut progresses until the wires are at an angle of 45 degrees and have passed through the bar of clay, when, by an oscillating movement, the cutter frame is straightened and the wires are slanted in the opposite direction, ready for the return cut, which is also in a downward direction. The perfect movement is secured by the position of the respective cranks, as seen in the cut. The advantages of this movement are many. The cutting wires passing through the bar of clay in an angular, downward and shearing direction insures a perfect, smooth cut. On account of the combined movement of the cutting mechanism the wires are not strained to their utmost limit, and consequently last much longer. The oscillating movement gives the machine an even balance, as the reversal of direction is easy and gradual, which insures a smoothness of operation.

The combined movement of the wire cutting bars gives a shorter wire, insuring their better support and longer life. The cutting bars being driven by cranks at **BOTH ENDS** of the machine, insure a perfect alignment and an absolutely rigid, square and even cut.

The machine is built on new designs throughout. Capacity 5,000 to 10,000 perfect brick per hour.



No. 4.

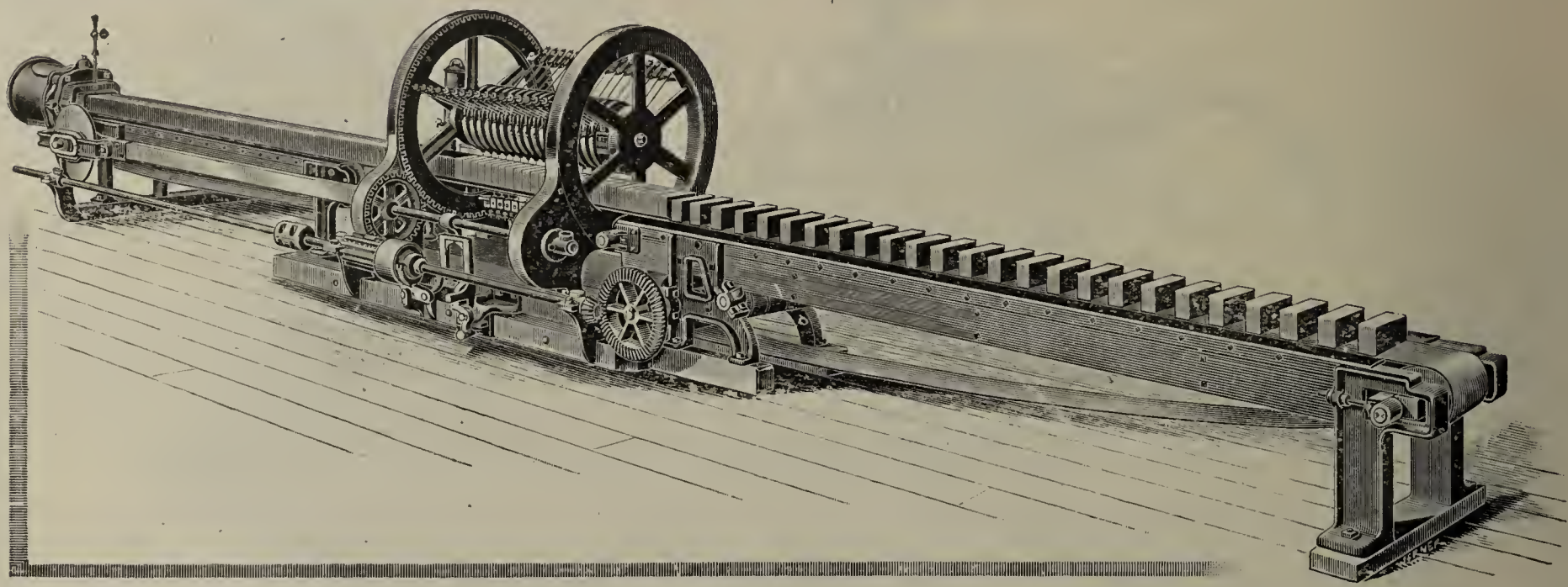
The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

NEW YORK OFFICE:
39 and 41 Cortlandt Street.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



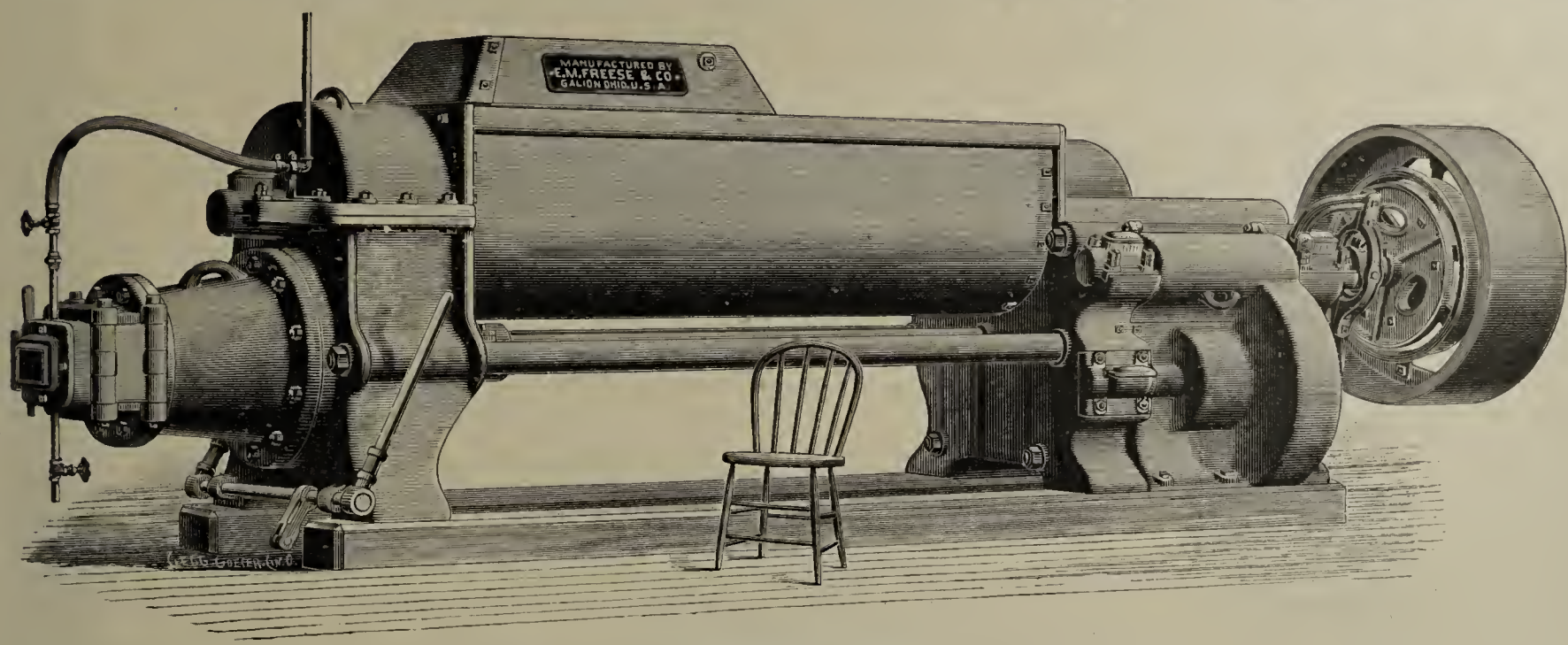
A New Rotating Cutter for Side Cut Brick.

POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

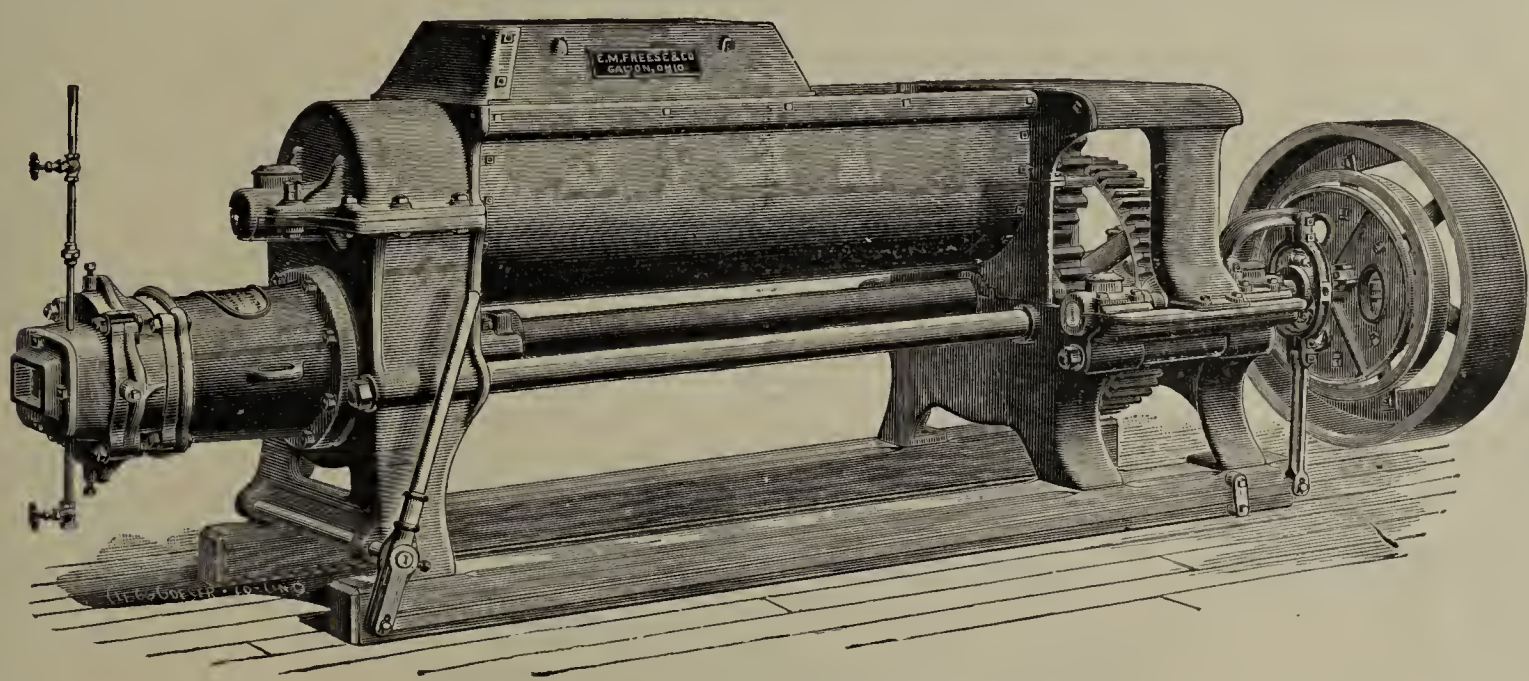
E. M. FREESE & CO.,
Galion, Ohio.

The Original Union Brick Machines



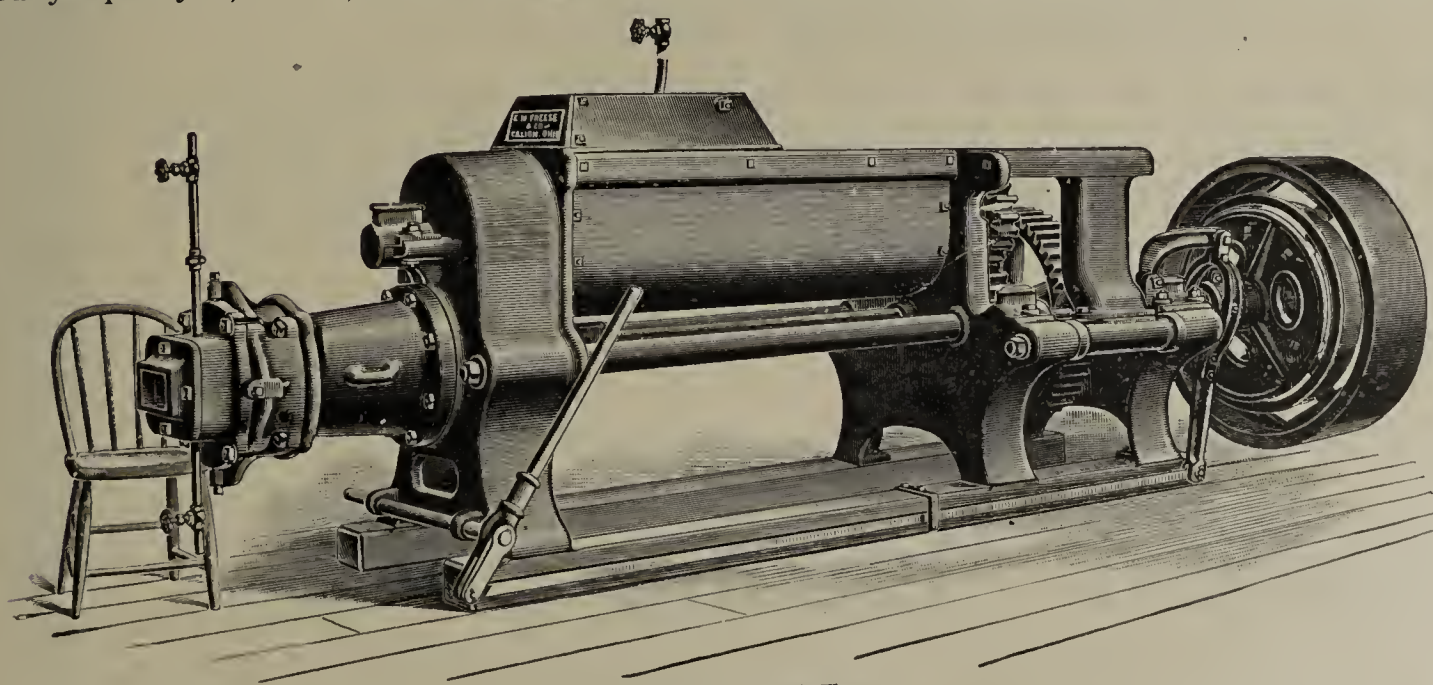
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

E. M. FREESE & CO., Galion, Ohio.

The Value of Confidence.

WE TRY to run our business, so that each new buyer becomes one more on our list of firm friends.

Therefore we have more friends than we had twelve years ago, or one year ago.

As the trade becomes better acquainted with us their confidence in us increases and sales are easier, larger and more numerous.

There is no secret in our method. We are liberal, because it pays to be liberal. The better we serve you the stronger hold we have on your patronage. It is our constant aim to give the money's worth every time.

FOR INFORMATION ABOUT

The Strongest Soft Clay Brick Machine

BUILT IN AMERICA,

Write

The Eastern Machinery Co.,

NEW HAVEN, CONN.

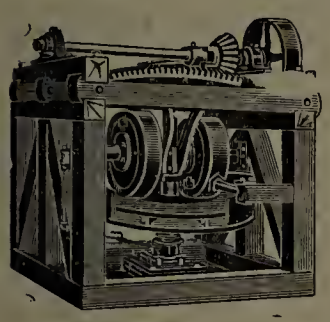
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

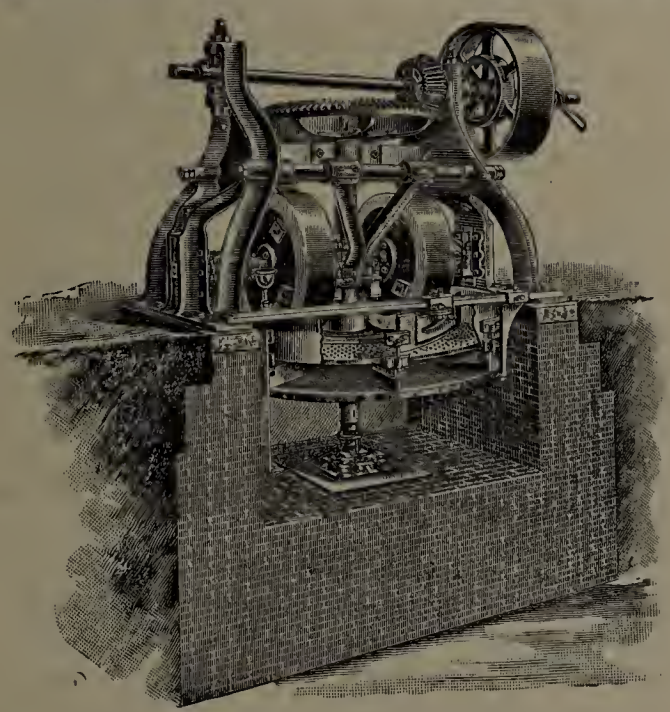
MANUFACTURERS OF

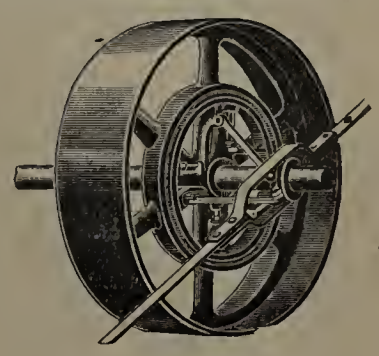
Brick Machinery.

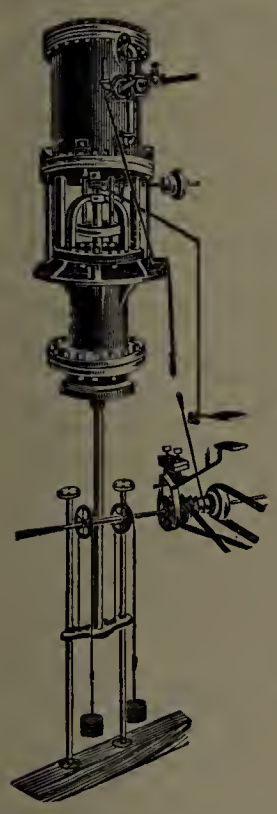
COMPLETE EQUIPMENTS.

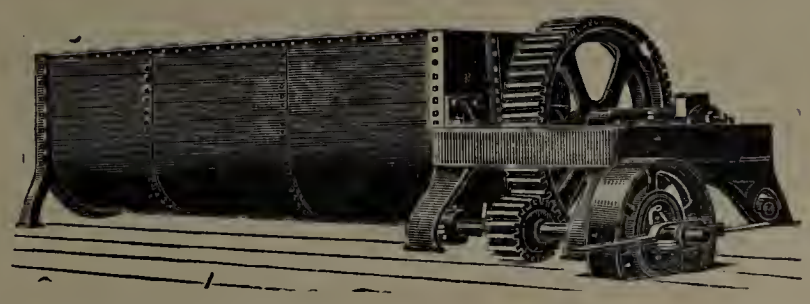
Tile Machinery.











Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

A Few Facts

About the
"A. B. C." BRICK DRYER.

It will enable you to run the year round, despite weather conditions. It will enable you to make and dry your brick for 20 cents a thousand or less. It will dry your brick without injury.

Catalogue on request.

American Blower Company,
Detroit, Michigan.

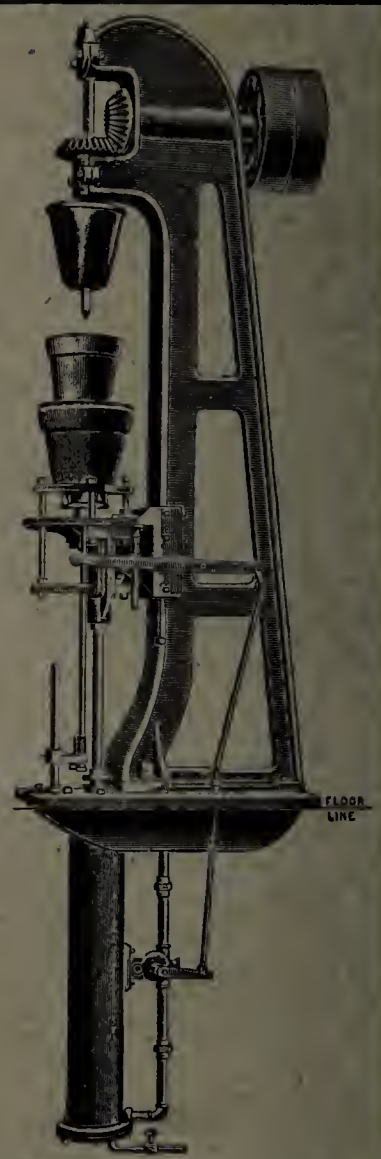
New York. Chicago. London.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS,
OHIO, U. S. A.

MANUFACTURERS OF
ALL KINDS OF

Clayworking Machinery.



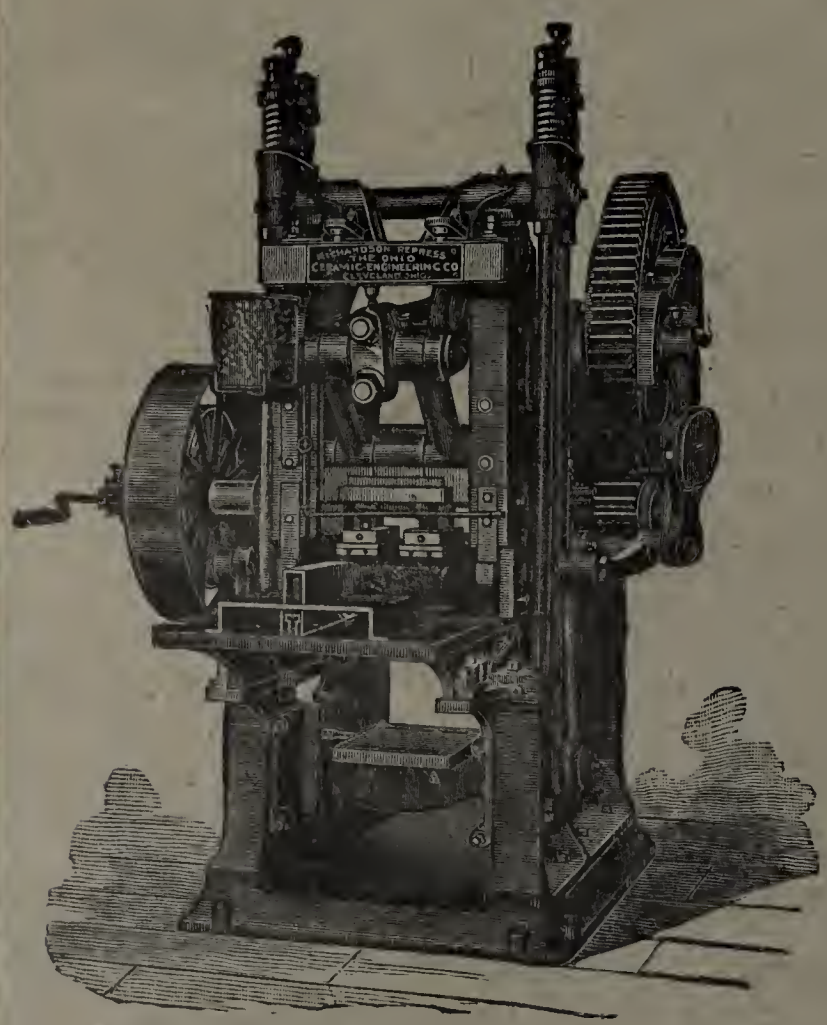
The accompanying cut shows our improved machine for making

Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



The RICHARDSON REPRESS.

If it won't do what we say it will do, Return it.

THESE ARE OUR INSTRUCTIONS TO BUYERS OF THE RICHARDSON REPRESS,

OUR LINE INCLUDES

Two sizes Power Represses.
Two sizes Hand Represses.
Also Hand Presses for Ornamental Brick.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

Table of Contents, Page 552.

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII, No. 6. INDIANAPOLIS, IND., JUNE, 1900. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We Aim to Build only the Best in its Class.

Birmingham, Ala., May 8th, 1900.

CHAMBERS BROTHERS CO., Philadelphia Pa.

Dear Sirs:—We beg to hand you herewith settlement of balance of account for the B. C. D. Brick Machine, Edger and Pug Mill, and hope the same will prove satisfactory.

We beg, further, to say that the Machine, Edger and Pug Mill are all now at work, and are giving entire satisfaction. We were very materially aided in getting things smoothed out by your Mr. Munger, whom we regard as a good workman and a safe, conservative man, and we beg to thank both you and him for his assistance in getting the machines and our engine and other things in good working condition. We expressed to him our thanks by a slight token of the same, and take this method of giving you our good opinion of him as an employe of yours and as a man.

Wishing you continued success in the manufacture and sale of the very best brick machine on the market, we remain, Very truly yours,

COPELAND BRICK CO.,
By (SIGNED) J. R. COPELAND, President.

Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

The Atlas Bolt & Screw Co., Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

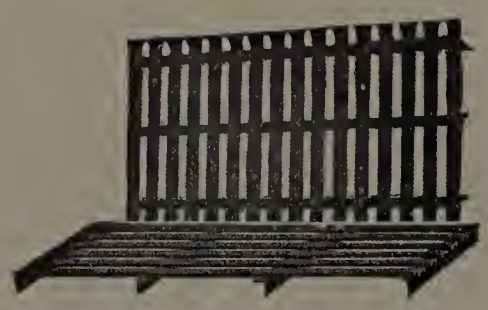
We are the Largest Manufacturers of Dryer Cars in the World.

Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.

No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

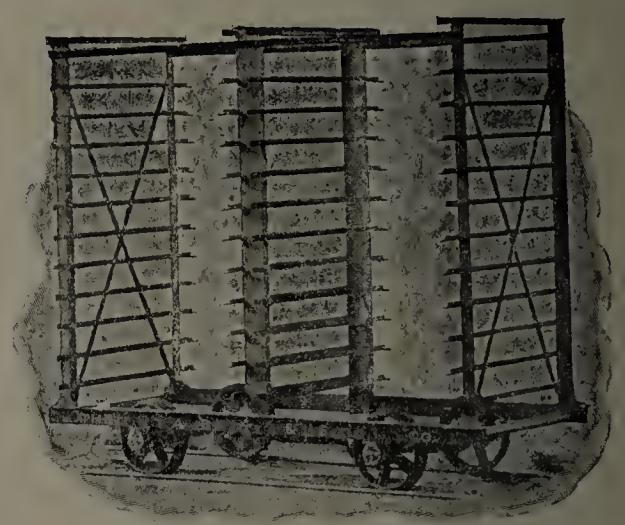
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet 7 inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name. Page.

American Clay-Working Mach Co, The 579, 582
Anderson Foundry and Mach. Works 512, 513
Chicago Brick Machinery Co... 514
Chisholm, Boyd & White Co... 559
Fernholtz Brick Machinery Co. The 517
Progress Press Brick and Machine Co 561
Ross-Keller Brick Machine Co ..

Brick and Tile Machinery.

Adrain Brick & Tile Machine Co 572
American Clay-Working Mach Co., The 579, 582
Anderson Foundry and Mach. Works 512, 513 574
Baird and Son, H. C 565
Battenfeld Mfg. Co, The 557
Brewer. H. & Co 583
Chambers Brothers Co 509
Chicago Brick Machinery Co... 514
Eastern Machinery Co, The.... 590
Fate & Co., The J. D 580
Freese, E. M. & Co 588, 589
Henry Martin Brick Mach. Mfg Co, The 585
Hensley, J. W 511
Horton Mfg Co, The 584
Kells & Sons 565
Leader Mfg. Co, The 575
Madden & Co 564
Ohio Ceramic Engineering Co., The 592
Ohio Machine Co 568
Potts & Co., C. & A 586, 587
Raymond Co., The C. W 553
Stedman Foundry and Machine Works 516
Steele, J. C., & Son 573
Stevenson & Co 591
Taplin, Rice & Co 516
Wallace Mfg. Co, The 581
Wellington Machine Co, The... 555
Wiles Co., A. M. & W. H 573

Brick Kilns and Dryers.

Alslp, S. H 563
American Blower Co, The..... 592
Barron, A. F 562
Bushong, M. M 576
Eudaly, W. A 576
Haigh, H 569
Illinois Supply and Construction Co, The 577
Morrison & Co., R. B 569
Phillips, S. G 563
Pike, E. M 566
Reppell, L. H 569
Swift, F. E 569
Standard Dry Kiln Co, The..... 518
Yates, Alfred 566

Brick Yard Supplies.

Atlas Bolt & Screw Co, The..... 510
Arnold, D. J. C 574
Borden & Selleck Co 563
Buhl Malleable Company..... 564
Cleveland Car Co 578
Caldwell & Son Co., H. W..... 567
Carmichael, T. W 565
Carnell, Geo 573
Coldewe & Co., G 568
Cox, Geo. S 568
Elder & Dunlap 568
Frost Engine Co 515
Harrington & King Perforating Co, The 511
Henry Martin Brick Machine Mfg. Co, The 585
Horton Mfg. Co, The 584
Jeffrey Manufacturing Co, The. 567
Kendall & Flick ....
Marion Steam Shovel Co 575
Murray Iron Works Co., The.. 561
Main Belting Co 562
Mershon & Co., W. B 566
Newton, A. H 567
Newton A. C 567
Phillips & McLaren 566
Rockwood Mfg. Co, The 564
Turner, Vaughn & Taylor Co... 592
Vanduzen Co., The E. W 566
Wells & Hall 565
Williams Patent Crusher and Pulverizer Co 517

Miscellaneous.

Burt Manufacturing Co 552
Chesapeake & Ohio R. R 567
Clinton Paving and Building Brick Co., The 571
Coaldale Brick & Tile Co., The . 570
Cotton Belt Route 568
Columbia Improvement Club. 569
Dean Bros. Steam Pump Works 565
DeWit, H 572
Evens & Howard 565
Gabriel & Schall 565
Green & Hunter Brick Co 570
Harper-Norton Shale Brick Co The 570
Indianapolis Engraving and Electro Co 566, 567
Indiana, Decatur & Western ... 568
Indiana Paving Brick & Block Co 570
Lake Erie & Western 568
Miller Oil and Supply Co 566
McAvoy Vitrified Brick Co 571
New York Brick and Paving Co 570
Osborne, W. R 566
Outing Mfg. Co 572
Preston Brick Co 571
Pennsylvania Line 567
Purington Paving Brick Co, The 571
Sears, Roebuck & Co 565
Terre Haute Brick and Pipe Co. 571
Vandalia Line 567
Wabash Clay Co., The 571
Ads., Small Wanted, For Sale, etc.

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

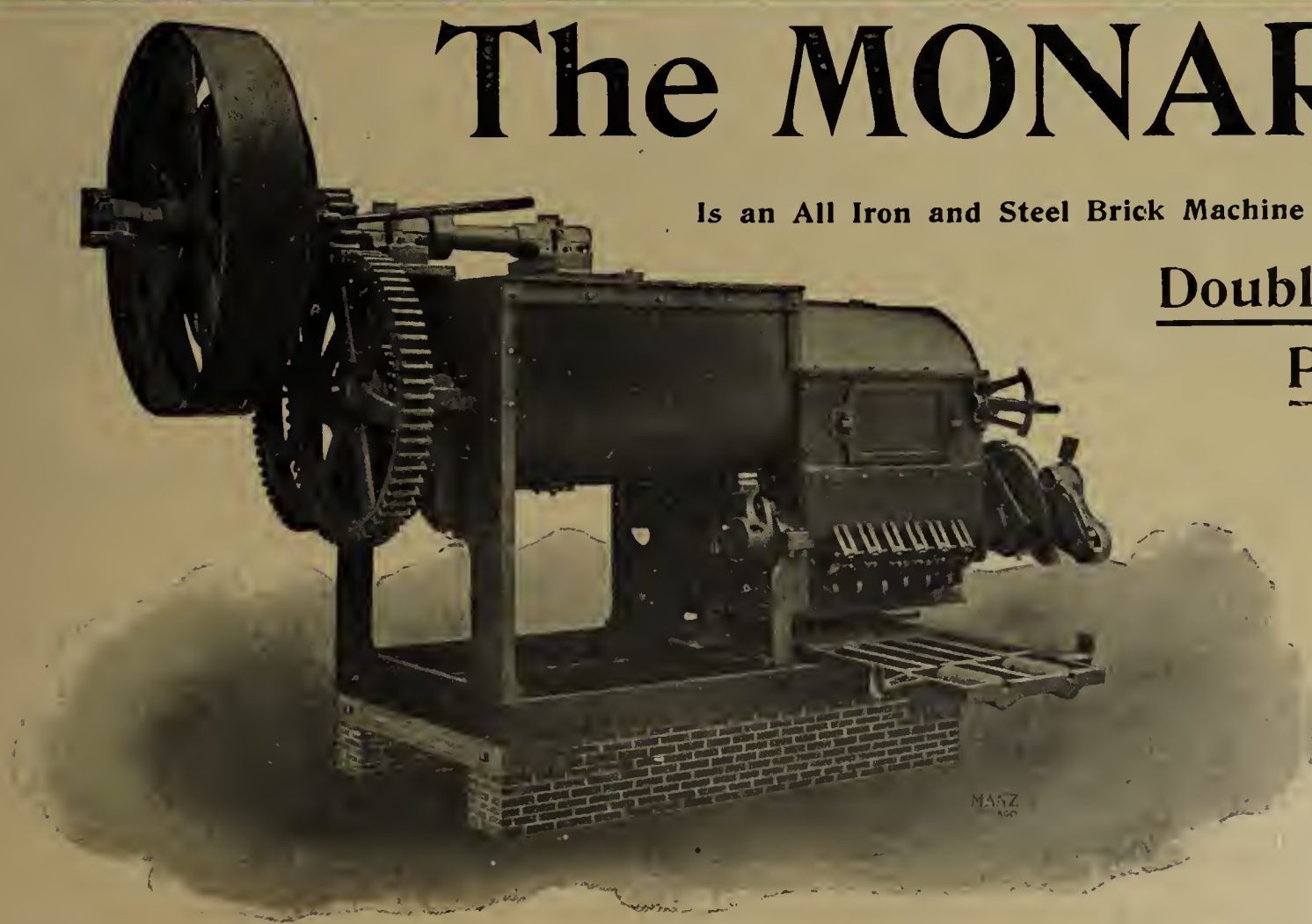
Samples or blue prints with prices furnished on request.

THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.



SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

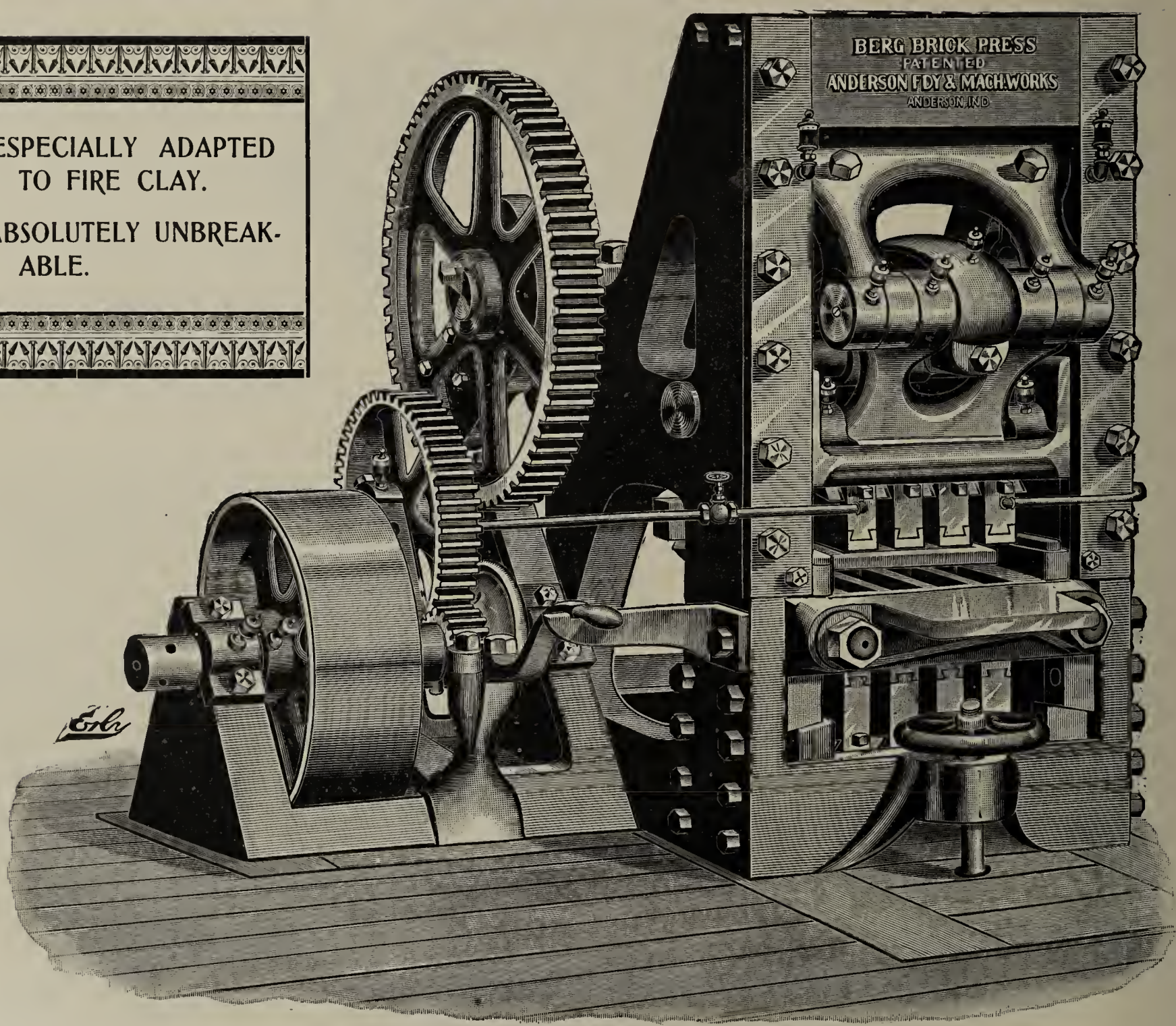
JAMES W. HENSLEY, Successor to S. K. FLETCHER. **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

CALLING A BLUFF.

ONE of our esteemed competitors is trying to create the Impression in the Trade that our Berg Press infringes their patents; but this is Simply a Bluff, and **a Bluff is Only Good until it is Called.**

The following letter from the Inventor of the Machine which it is claimed we infringe should be sufficient to "Call" any Bluff of this kind:

COPY.

September 30, 1899.

John J. Moroney, 225 Dearborn Street, Chicago:

Dear Sir—I have carefully examined the Berg brick press, built by you, and have compared it with all the patents pertaining to brick presses issued to B. C. White and to J. A. Boyd and B. C. White jointly. All of the above patents are owned by the Chisholm, Boyd & White Company, and comprise the only brick press patents owned by said company up to January, 1898. The Boyd brick presses are built under these patents.

I do not find that the Berg press infringes any claim ofany of the above patents, and I see no way in which a suit against the Berg press or its builders or users could be successfully maintained by the owners of the White or Boyd & White patents.

In making this statement I take into consideration the prior state of the art, whereby a number of the claims allowed to White & Boyd and to White are limited to such an extent that they do not cover your machine.

The Boyd brick presses are all machines of my own design and invention in every important particular.

In conducting a long patent litigation involving these patents, I made a thorough examination of all patents relating to brick presses, and am therefore qualified to make the above statements without fear of succesful contradiction.

I am, yours truly,

(SIGNED) B. C. WHITE.

THE fact that we are selling these Berg Presses faster than we can build them, and are selling the majority to old dry press brickmakers, shows the trade recognizes that the above claim is nothing but a bluff and has no foundation in fact. Every purchaser of a **Berg Press** is given **Ample Security,** satisfactory to himself, to protect him against all possible costs or trouble arising from any patent litigation on account of the use of this machine.

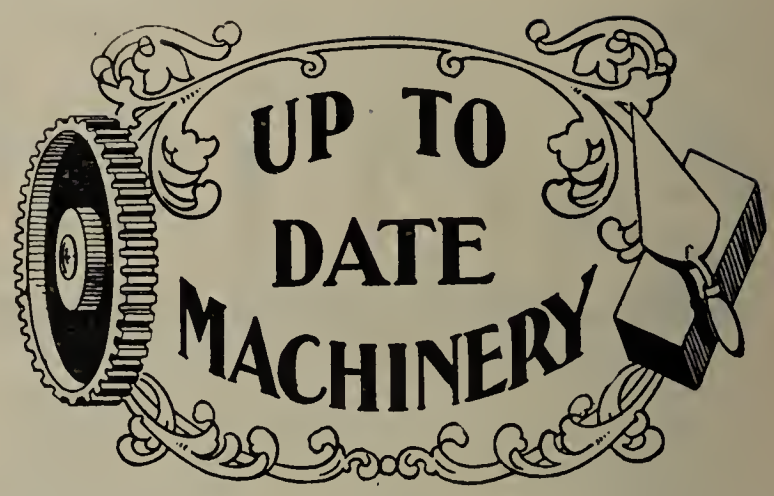
MANUFACTURED BY

The Anderson Foundry and Machine Works,

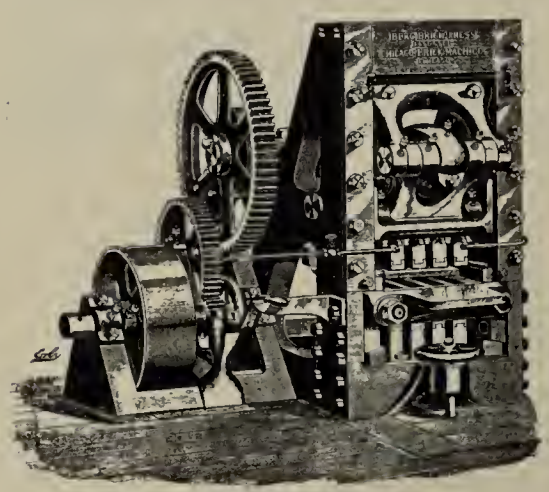
Anderson, Indiana.

Sold by CHICAGO BRICK MACHINERY CO., 225 Dearborn St., CHICAGO.

When Buying a New Machine



Why not get it strictly **Up-to-Date.** In no other line of industry, excepting perhaps the electrical, has there been so many and such radical improvements during the past few years as in Clayworking Machinery. The dull times have been utilized to good advantage in perfecting our machinery, and the buyer of to-day gets the benefit. Why put in a Back Number, when an Up-to-Date Machine costs no more?

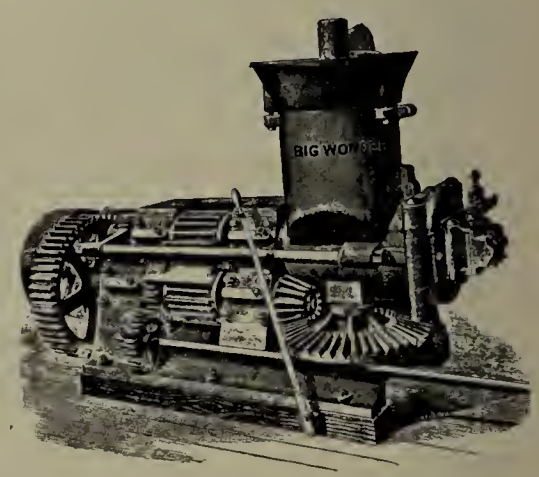


Dry Press Machinery.

Our BERG PRESS is the simplest and strongest of all Dry Presses. Three distinct pressures; absolutely unbreakable in pressing clay. Makes Shape Brick as easily as Standards, and is making in regular work blocks 18x13 inches. Specially adapted to Fire Brick and Fire Clay Shapes. **Fully Guaranteed** in every respect.

Send for Special Dry Press Circular.

Stiff Clay Machinery.

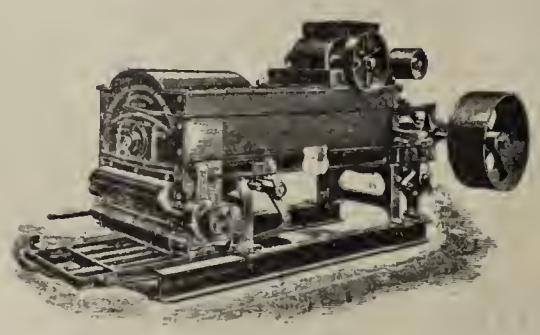


Our WONDER BRICK & TILE MACHINE is the most modern and improved type of Auger Machinery. Turns clay at Right Angles while in motion, breaking up and destroying laminations. Specially designed dies and augers to prevent laminations. Works many clays that cannot be worked on other auger machines.

Built in four sizes, capacities up to 100,000 per day. Makes Drain Tile equally well and equally rapidly.

Full Line of Cutting Tables, Crushers and Stone Separators, Pug-Mills, etc., adapted to all kinds of clay.

Send for Special Illustrated Catalogue.



Soft Clay Machinery.

Our HORIZONTAL COMBINATION MACHINE is the latest and highest development of the Soft Clay System for making Sand Molded Brick. Works clay direct from bank, doing away with all soak pits and tempering.

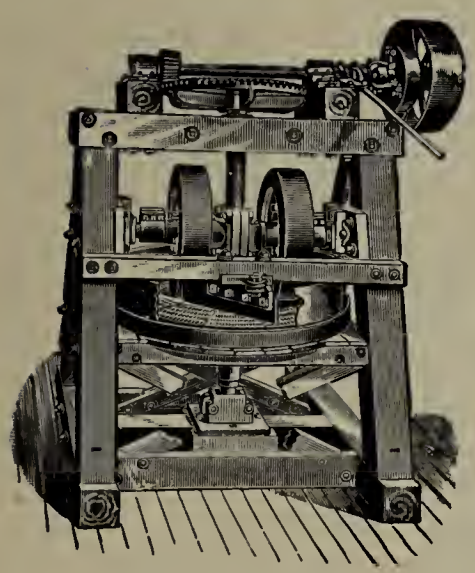
We also have Upright Machines for working clay that has previously been soaked, and Horse Power Machines for small yards.

CHICAGO BRICK MACHINERY CO.,

Send for Illustrated Catalogue. **225 Dearborn Street, CHICAGO, ILL.**

OUR SPECIALTY IS

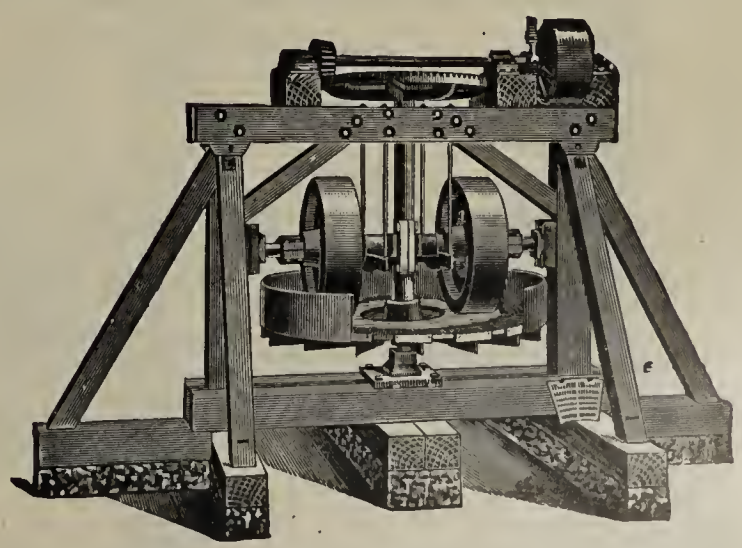
DRY PANS.



IRON FRAMES,

WOOD FRAMES.

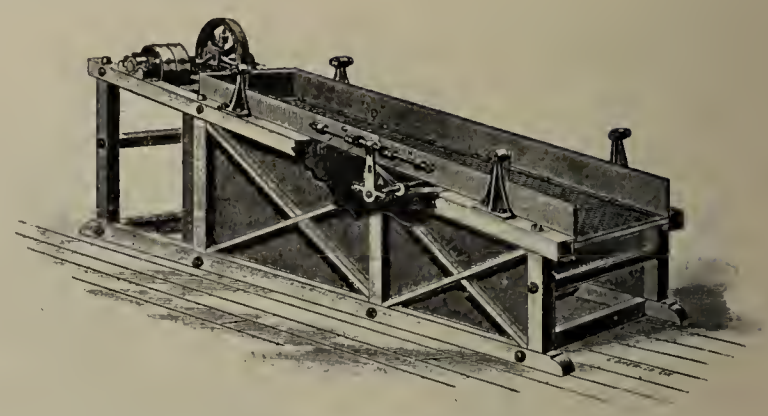
All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

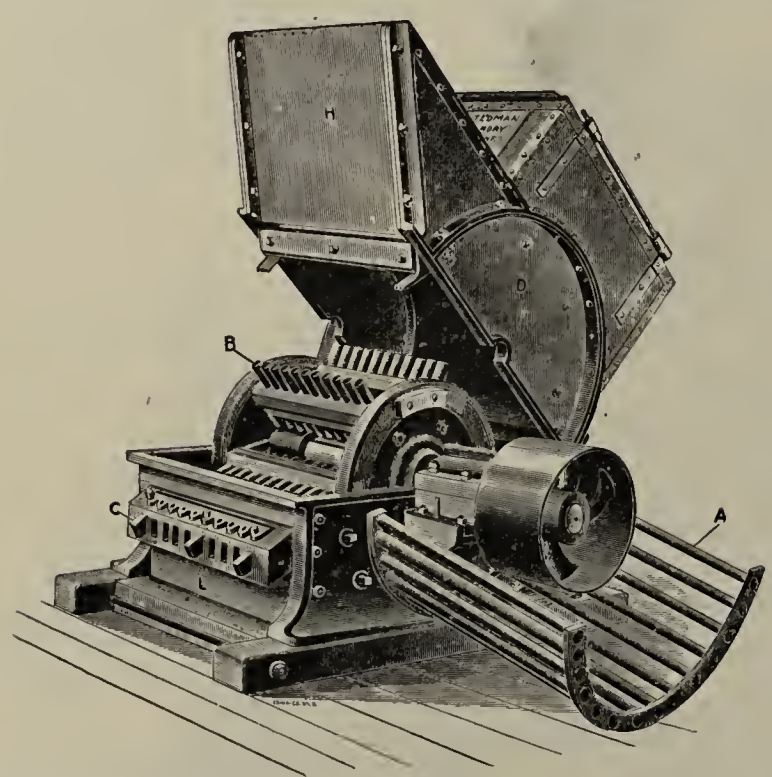
FROST ENGINE CO., Galesburg, Ill., U. S. A.

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.



A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel.



STEDMAN'S CYCLONE CLAY PULVERIZER.

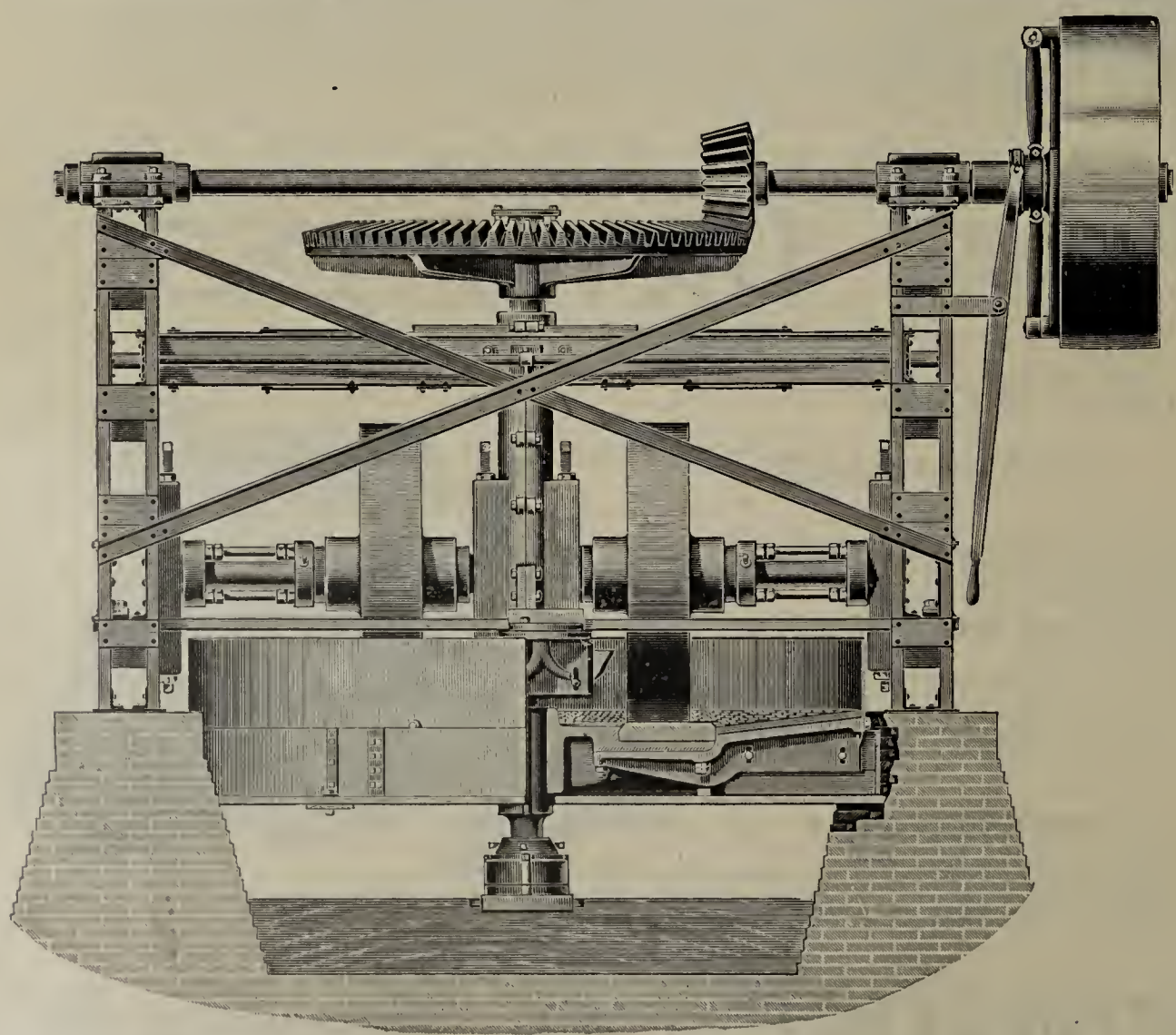
For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials.

Stedman Foundry and Machine Works,

Aurora, Indiana.



MODERN DRY AND WET PANS,

Lightest Running
Greatest Strength
Most Convenient for Repair.

18

MACHINES OF THIS TYPE SOLD IN 3 MONTHS.

Complete or Part Outfit for

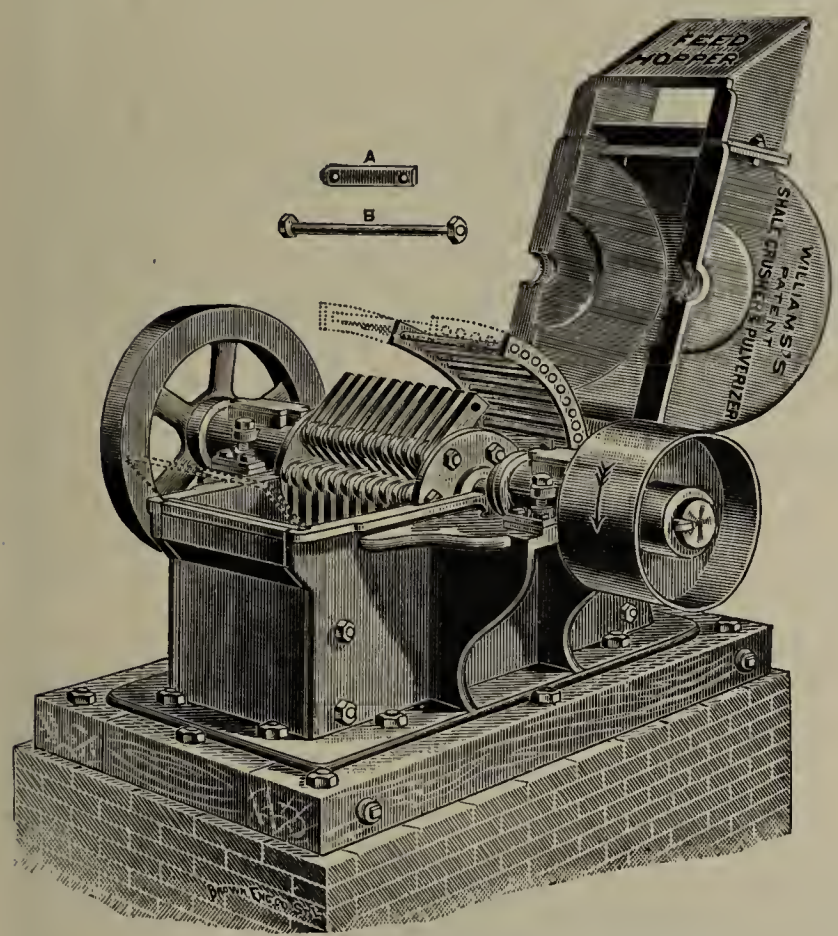
Sewer Pipe, Fire Proofing and Pottery Machinery.

Write us for Catalog and Prices.

TAPLIN, RICE & CO., Akron, Ohio, U. S. A.

The Williams Patent Crusher & Pulverizer Co.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

FOR FURTHER INFORMATION WRITE TO

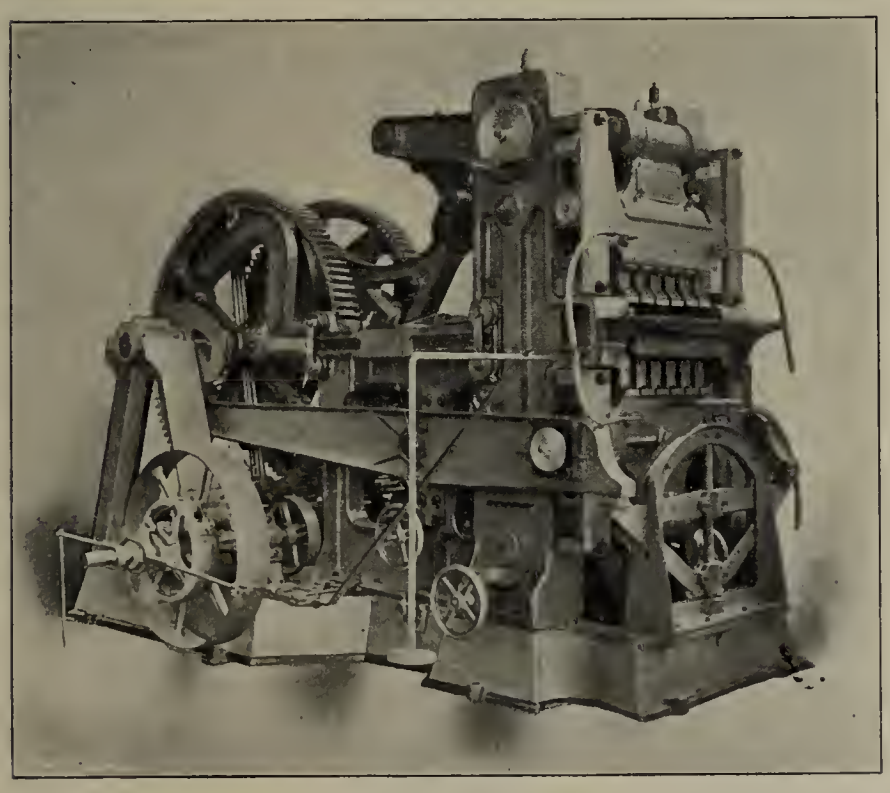
The Williams Patent Crusher and Pulverizer Company,

2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Singer Building.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, SIMPLICITY and SERVICE.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market.

All parts subject to strain are made of the best Bessemer steel.

Fitted with the Fernholtz Mold Box. Undoubtedly the leader.

We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer,** in our own factory.

Dealers in Brickyard Supplies.

PARIS, TEXAS, March 13, 1900.
THE FERNHOLTZ BRICK MACHINERY CO., St. Louis, Mo.
Gentlemen:—We are in receipt of your inquiry in regard to our Brick Machine, and in reply beg to say that we have been operating machine regularly for five years, and the repairs on same have been about $50.
We consider this a very good record and will take pleasure in recommending it to anyone who is interested in Brick Machinery.
Very truly yours, CARTER & ROLLINS.
Per Carter.

Further Information on Application.

The Fernholtz Brick Machinery Co.,

CABLE ADDRESS "FERNBRICK."
WESTERN UNION CODE.

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

Mexico Agent: INTERNATIONAL SUPPLY COMPANY, City of Mexico, Mexico.

The STANDARD BRICK DRIER,

Dries any and all kinds of clay products, and does it thoroughly and economically. It is always sold under an iron-clad guarantee to do a given amount of work in a specified time. **It does not disappoint.** You take absolutely no risk in buying "The Standard" Drier under our guarantee as we as-ume the responsibility of turning over to you a complete drying plant, capable of doing whatever we say it will do.

We Plan, Build and Equip Complete Drying Plants of any Capacity Desired.

We shall be pleased to answer all questions concerning the drying of any kind of clay products, and explain fully how and why "The Standard" is the **most profitable** Drier that any clay manufacturer can use.

Write for Catalogue No. 50 and Testimonials.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., JUNE, 1900. No. 6.

WRITTEN FOR THE CLAY-WORKER

OLD FRENCH BRICKWORK.

Observations of an American Tourist.

THOUGH IT HAS been several months since the writer sailed from New York, and the time since has been spent chiefly in sightseeing in England and France, it will not take long to tell what I have to say of special interest to brickmakers.

The Clay-Worker has at different times told of the universal use of brick in England, so I was not much surprised to notice while journeying through the "tight little isle" that even the barns and farm buildings are commonly constructed of brick. My stay in England was brief, so I got little more than an impression of the people and their surroundings.

I spent a week or so in London, and hunted diligently for brick houses, but did not find any that I thought you would care to picture in these columns. The brick architecture of London, as I saw it, is very ordinary. Plain, red brick, laid in white mortar with stone trimmings, is the rule. I saw no terra cotta or press brick fronts at all. I did see an occasional structure faced with enameled brick. These are usually in gaudy colors. Aside from this feature, London architecture is so similar that I am inclined to think many, many years ago there was an architect who planned these structures, and his designs and specifications have been in use ever since. It would not surprise me to learn that this architect was also a stone mason. So far as I discovered there is no variety, or originality, displayed in the residential architecture of London.

A FIFTEENTH CENTURY BRICK FIRE PLACE.

The same is true, in a large measure, of Paris, where much the same conditions prevail. It is all in marked contrast with what we are accustomed to in America, where it seems no two dwellings are built alike. Many of our homes are over-decorated, but to my mind a variety of questionable character is preferable to monotony, if for no other reason than that it occasionally affords us an opportunity to laugh at some monstrosity.

Most of my time has been spent in the neighborhood of Tours, France. Have taken many side trips from this old town to the chateaus and ancient castles, for which Touraine is famous, and send with this some photographs which may interest the readers of The Clay-Worker.

Among the historic characters most closely identified with Tours, probably none are

more generally known than the crafty Louis XI., who all readers of Scott became familiar with in Quentin Durward. His old chateau of Plessis les Tours was about two miles from the center of the town, and is now nothing but a ruin, but I found some old brickwork which is quite interesting. Only one wing of the building is left standing. The chateau was built in 1463, and was an enormous pile. Where stood a portion of this structure at one time, there is now a truck garden. The old guard's room, on the lower floor, is now a wagon house, and the big fireplace, where Louis XI. Scottish Archers were wont to toast their shins long before America was discovered, there is now a huge feed boiler.

In the top of the octagonal tower, which is still standing, there is a room reached by a little spiral stairway, where Louis had Charles VIII. imprisoned for five years. In this room there is a brick fireplace which is still in a very good state of preservation, as may be seen from the accompanying photograph. Some portions of the building have been "restored," but the views which I send show the original brickwork.

A Portion of Louis XI Chateau, near Tours, France, erected in 1463.

I also send a picture of a part of the house of Tristan l'Ermite, who was Louis's hangman. The street is so narrow one cannot photograph the whole house, which is a very good specimen of fifteenth century brickwork. The rope pattern in the brickwork is supposed to be emblematic. R. D. C.

HOW TO "TAKE A DROP."

We have all heard of the man who sat on the limb of a tree when he sawed it off. A parallel trick was recently performed at a certain machine shop within the range of our acquaintance. A large horizontal overhead belt was to be removed, and a machinist got up on it and cut the lacing, letting himself down anything but gently.—American Machinist.

Written for The Clay-Worker.

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 8.

BY ALFRED CROSSLEY.

CALCINING CLAY.

FOR ORDINARY FIRE BRICK calcining clay is very little practiced in England, while in America it is almost universal to add a proportion of this previously burned clay to the mixture. In the case of fire brick made from nonplastic clays I have never been able to see any real necessity for this. With this class of clays I have used the same clay for the same grade of brick, both with and without calcine, and have had equally good, if not better, reports of the brick made without. I will not say that for special purposes an addition of, say, one-fourth calcined clay will not be an improvement in the brick, but, with this exception, the brick for ordinary uses will be practically as good without. In the case of plastic clays it is different. Plasticity in a fire clay, as before explained, reduces its refactoriness, and in this case to calcine a portion of the clay is to produce artificially a similar effect to the use of nonplastic clay naturally.

The calcined clay is in some places termed "cement," and, in others, "chamotte." The celebrated Amboy clay of New Jersey, which is a highly plastic clay, is, a large proportion of it, calcined before being made into brick. In this case it is not difficult to understand the advantage, as a brick made entirely of the raw clay would be too plastic and would not have the proper grain. In the manufacture of glass pots and crucibles not less than from one-third to one-half of the clay is first calcined. But here we find an entirely different reason, and one that can be readily understood, viz., that glass pots and crucibles are very seldom burned before being used, more especially the former. The object is to reduce the contraction to a minimum, and thus neutralize the tendency to crack when put into use. The difference in the reason between using calcined clay for these articles, which are used in their raw or unburnt state, and fire brick, which are always burnt before being used, will be apparent.

In calcining clay for fire-brick making, the raw clay as it comes from the mine or pit is used, and of this the lumps are preferable for the purpose. The reason for this is that the small or fine clay does not readily permit the draft to work through, while the lumps can be more easily placed for burning and the fire can get a draft through between them. The process of calcining may be accomplished in several ways, according to the quantity required and the facilities at hand. It may be burnt along with the brick, and in some cases it has been the custom to set a certain amount of clay on top of every kiln and thus obtain the required regular supply. When ordinary care and common sense are used this is a convenient method, but if carelessly done the result may be a spoiled kiln. Where a large quantity is required it is best to burn the clay by itself. This can be done in a very primitive fashion where cordwood is plentiful and cheap. Those familiar with the old method of burning lime or ore in clamps

would have no trouble in burning clay the same way. Alternate layers of wood and clay are piled together as high as convenient, the sides being well battered or sloped to prevent falling, and care being taken to have the clay well surrounded with wood, and also a sufficient quantity of wood used to thoroughly burn the clay. Another method is to build small updraft kilns, round or square, specially for the purpose, and fire in the same manner as a brick kiln, with wood or coal. Of course, care is required in setting to get safely over the arches. At the celebrated Mount Savage Fire-brick Works small, round, down-draft kilns, built especially for the purpose, are used. The best and most practical plan of kiln, where a regular supply of calcined clay is required, is the one built on the same principle as the modern lime kiln. In this kiln the process never stops, except when the kiln has to go out for repairs or other reasons. The construction of the kiln is such that, as the clay burns, it can be discharged at the bottom of the kiln without interfering with the fires. Fresh clay is fed in at the charging hole at the top, and the operation is continuous. Besides the great advantage of the steady and constant supply, it has also the advantage of using some of the small clay instead of requiring all lumps. The clay, in calcining, should be burned nearly or quite as hard as fire brick themselves, or, at any rate, up to the point of getting out all the shrinkage. It is, of course, unnecessary to say that the calcined clay should be properly and thoroughly mixed with the raw clay in order to get a good brick. The proportions of each cannot be determined by any general rule. These proportions vary considerably at different places, and experiments have to be made to ascertain what proportions give the best results for the different grades required for different purposes. Clays in different localities vary so much in their nature that no uniform rule will apply.

(To be Continued.)

House of Hangman Tristan l'Ermite, built in the Fifteenth Century, near Tours, France.

A NINETEENTH CENTURY MIRACLE.

A New York correspondent says that Charles M. Schwab, president of the Carnegie Steel Company, came up from the cinder pile, and now receives a salary equal to that of the President of the United States. He is a smoothly shaven young man only thirty-seven years old. Twenty years ago he was earning a dollar a day.

Mr. Schwab was raised in a little town in Pennsylvania, and his first employment when he was fifteen years old was driving a mail wagon to a neighboring town. Later he worked in a grocery for $10 a month and board. What spare time he had was spent in the steel works at that place.

He had a leaning for the iron business, and, after many efforts, succeeded in obtaining employment in Mr. Carnegie's establishment. This was in 1880. He was assigned a small place in the engineers' corps at $1 a day. For seven years he assisted the builders, and was then promoted to the head of the engineers' corps. In this capacity he built the plant at Homestead. For two years he had more or less to do with the management of the plant, and then he was made man-

ager of the Edgar Thomas steel works. His next advancement was the management of the Carnegie Steel Company. About this time he was offered $25,000 a year to go to England and take charge of the iron works of an English company, but declined. When Mr. Carnegie heard of this he suggested to Mr. Schwab that he was throwing away a good thing. The young man replied frankly that his ambition was in another direction. "What do you want?" inquired the ironmaster. "To be a partner in the Carnegie Company." Mr. Schwab was soon after made a partner. He is chiefly self-educated, and says he does not believe in a college education for a business man.—Ad. Sense.

WRITTEN FOR THE CLAY-WORKER.

WEDGWOOD.

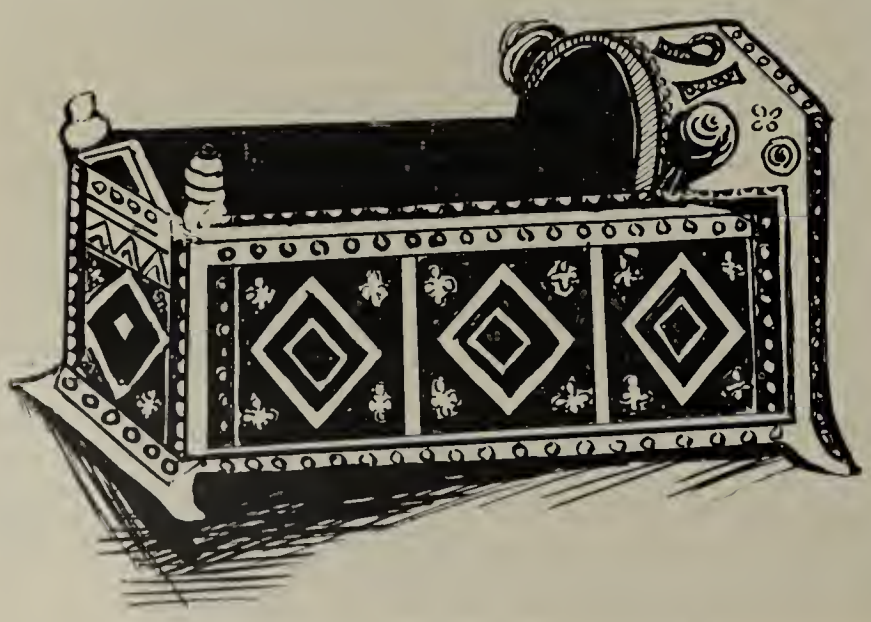
Art in Ceramics.

THROUGHOUT THE UNIVERSAL world no one name is so closely identified with the potter's art as Wedgwood, admired for the pure and chaste qualities of his embellishment, esteemed for the quiet harmonizing effect, and respected for the strength and persistency of his labors, which gave to a period corrupt a leaven of good wholesome dignity, coupled with a grace of human proportions and gracefulness in the long flowing vestments of the ancient Greek.

Again, it is a question whether, among the workers of the present day, he should not be claimed the father, if not the actual progenitor, of the terra cotta field and market as we see it to-day, since the efforts made by him, although culminating in a disappointment that was lifelong, was toward the influencing of the architects of his day to use terra cotta ornaments and bas reliefs in the facades and other parts of the houses and buildings.

From the early sixteenth century the Wedgwoods were known in Staffordshire (England) as potters, and the earliest specimen known is a small earthenware cradle, shown in the celebrated Bateman collection, bearing the legend of 1693.

The first to be recognized was Thomas Wedgwood, who, as



Earthenware Cradle "1646" ascribed to J. Wedgwood.

father to Aaron, Richard and Thomas, gave them the principles of his rude art and poorer learning. Of the three Aaron was more successful, and was duly dubbed the first potter by reason of his success in making the mottled and black ware.

In their rude and humbler way they thrived by selling their pieces individually on market day, sometimes replenishing their larder by the exchange of their wares, in the good old days, when mutton was 4 cents a pound and house rental could be paid yearly with a ten-dollar bill.

The profits accruing from the insidious labors of Aaron enabled him to educate his two sons—Thomas and John—and, although the former is often spoken of by contemporary writers as Dr. Thomas Wedgwood, it is doubtful if he knew anything of human anatomy or the materia medica, but he was a student of chemistry, and to this may be attributed the reason of the sobriquet earned and, furthermore, points clearly

1. View "Choice of Hercules," Wedgwood Plaque.

to the success achieved by a later generation. He was also known as the tenant of the "Red Lion Inn," after his marriage with his cousin, Catherine; therefore, it may be assumed that while he was making beer mugs his wife, as a faithful helpmeet, was filling them.

Earthenware tablets, standing in Wolstanton churchyard today, serving as tombstones, prove that, minus the advertising opportunity, the Wedgwoods were as sagacious as the modern Yankee merchant. And who shall deny the utilitarian virtue possessed by the ware? An able resister of the weather, these earthenware slabs or tablets, bearing the inscriptions in white, and set in the light brown glazed body, after the manner of the old tile. In addition to the making of marble, agate, cauli-

2. Hercules in the Garden of Hesperides.

flower and melon wares, he excelled in the embossed work, paying much care and attention to the construction of the mould and the art of modeling.

From its contiguity to the potteries, Birmingham was always resorted to for many of the articles used by enamelers and others.

If a modeler was wanted for the china works at Burslam or Bow, near London, or a thrower of mottled or cloudy earthenware for the works at Bristol, he was sought for in this direction, and some of the best blue and white painters and enamelers at the former place were probably Birmingham and Staffordshire men. Here it was that William Littler, afterward partner of Aaron Wedgwood, advertised, in 1752, the success of his china works at Longton Hall, near Newcastle, and two years later choice articles in Staffordshire ware could be purchased in the shops of that town.

It was not, however, until the advent of Joseph Wedgwood,

3. Birth and Baptism of Achilles.

after 1752, that we find the ware gradually changing form and color and bearing in its embellishments all the essentials of high art. It was about this time that one W. Wheeldon en-

tered into partnership with Joseph Wedgwood, and, together, they immediately set about to make, first, the necessary purchase of coal, which was bought at the mouth of the pits and brought over to the pot works on horseback.

For the first six months of his newly formed partnership Joseph labored, preparing and making models and necessary implements. And the first result was a new kind of green ware, exquisitely molded in perfect imitation of leaves and fruits.

But its rarest specialty was its glazing, and for gloss and brilliancy of color it has never been superseded. The secret of the old green glaze of the Roman pottery had been lost, when tile works fell into disuse, along in 1650.

By the adoption of the following formula Joseph was able to again revive the green:

Flint glass	6	Vitrified.
Red lead	2	"
White enamel	4	"
Calcined copper	1½	

This would and did result in a blue green, and it is, there-

4. The Spinning Girl.

fore, assumed that an additional quantum of yellow was infused to make the same green.

The modern formulas differ somewhat:

Sulphate of copper	6
Precipitated by solution of borax	4
White glass	10

Oxide of chronium, which gives a beautiful effect, is also occasionally used.

Wheeldon was for form and Wedgwood for ornament. Plates, dessert services, teacups and saucers and candlesticks were in great demand. But the choicest of the small wares to be traced to the period of Wheeldon's partnership were the oval snuff boxes.

In 1756 John and Thomas Wedgwood, having accumulated a small fortune, out of friendship for their talented young kinsman, proposed to lease him, for the modest sum of $50 per year, such part of the working premises as they did not desire

5. Priam Begging the Body of Hector.

for their own use. This consisted of two muffled kilns, 25 and 30 feet, respectively, a living house and sheds. Thus, in the spring of 1757, we find Joseph Wedgwood duly but humbly installed in the centerfield of his great career.

Many repeated failures were associated with his many efforts, but finally he succeeded in producing a fine example of the cream ware, and the Oriental delft. This latter was due to an opportunity which presented itself by a family living in the neighborhood who possessed a delft dinner service, highly prized and the envy of all. Unfortunately, however, the largest piece, an 18-inch dish, had been broken, and, despite the efforts of the other potters, could never be replaced. At length Mr. Wedgwood was called upon and he achieved an immediate success, making an exact replica.

The story is told of how his most trusted servant was

6. Achilles and the Daughters of Lychomedes.

selected to carry home the valuable dish, which he did, carefully, between layers of hay in the saddle bag.

For nearly eight days Wedgwood waited impatiently for the man's return, when at length he made his appearance he was sharply asked the reason for his long absence.

"Master," said he, "it took me a whole day to get there, but it took me a week to get away." So delighted were the family at Wedgwood's success, that they showed their pleasure by entertaining the man.

An accident while in the saddle caused Wedgwood to be attended to by one Dr. Turner, who was the means of introducing Thomas Bentley, the great classical critic, who became at once the advance agent, general executive and long friend and partner of Wedgwood.

From this time on small medallions of celebrities were made, and in 1760 the first brick factory reared its head at Burslam, and on its completion an engine lathe was installed at the enormous cost of $26—twenty-six dollars! Think of it!

His increased connections with artists led greatly to develop his artistic efforts, and later through the energy of Thomas

7. Muses and Festoons.

Bentley, he was induced to open warerooms in Charles street, London. Much that is attributed to Wedgwood, in point of ideal figures and sets, is due to the exquisite modeling of Flaxman, who worked both in the character of a poet and an artist, but who worked in the humble capacity of a workman.

The "Somnus, or Sleeping Boy," was modeled by Coward and Hoskins, in 1772. The modeling, however, was one thing, the transference another, and in this Wedgwood succeeded where others made a signal failure. His consummate taste is to be recognized in every part of his art—color, adaptability, proportions and the continuation of a theme were always sources of delight. His one great disappointment, however, was his failure to induce the architects of his time to use terra cotta ornaments and bas reliefs in the facades and other parts of the houses and buildings. Wall linings of terra cotta would do away with the barbarous taste of the paper hanger, and floors of exquisite tiling would lend refinement to dwellings and be cleaner, he argued.

The solitary rabbit of Warren, of 1757, had, in 1765, given place to a noble range of manufactories, erected at a cost of $45,000, in four squares, and with accommodations for 1,000 workmen, supplied with all the best mechanics and mechanical contrivances, a Savery steam engine and engine lathes.

So enormous were the strides made that the London show

rooms became totally inadequate, and another was taken in St. Martin's lane, at $600 per year.

Artists, modelers, carvers and a master enameler and china piecer, French and Italian artists were here installed, whose main duty it was to copy the masterpieces of D'Hancar-Ville. Old china was mended with white glass and fired until the glass became vitrified. The success of the cream ware was a startling revelation to even Wedgwood, who saw every week vast crates being exported to every part of the globe.

An advance was now made from the cream ware to the black and the terra cotta, and a little later we find the outgrowth of his acquaintance with James Stuart, the author of the "Antiquities of Athens," in the charming and now well-known forms that make up the illustration.

Artists, modelers and enamelers did not earn, in those days, the wages per week that are now made daily by first-class workmen. With the exception of Hackwood, Perigo, Tassie, Coward, Hoskins, Laudra and Flaxman, who were classed as special designers and modelers, the latter always rendering his for services, the highest weekly wages paid was $8.00, and the average for artists, enamelers and others $2.50 to $3.50.

Russia proved to be a great stimulus in trade, and orders came for a thousand dozen plates, and an order from the great Catherine, for a $15,000 dinner service, tablets, chimney pieces, and in 1778 Sir William Bagot, of Blithefield, ordered for his library a chimney piece of the exquisite ware, to contain "The Apothesis of Homer," and "Apollo and the Nine Muses."

One year later and the "Choice of Hercules," illustrating a well-known passage in Xenophon, was executed.

"Hercules in the Garden of Hesperides," now maintained in the famous Henry Mayer collection at Liverpool, England, bears out in all its grace the ability and power of Flaxman as a modeler and sculptor, and under the broad view of a criticism it is not to be understood why he should have been "turned down" and refused the gold medal of the Royal Academy by so great an artist as Sir Josiah Reynolds, in 1775. Truly no man living was a better exponent of classical beauty and virtue, or a stronger foil against the corrupt issues of his time, than was he who lost the just credit of his lifetime devotion.

"The Birth and Baptism of Achilles" is another careful adjustment of art values accentuated on a jasper plaque and containing all the qualities of grace, poise and faithfulness to the law of true anatomy.

"The Spinning Girl" and "Priam Begging the Body of Hector" follow quickly in succession, and with it came the patronage of the English court and continental Europe, to which may be added the glorious example of action and a warlike theme.

"Achilles and the Daughters of Lychomedes," illustrated in cut 6; "The Muses and Festoons," also "Blind Man's Buff"

8 Blind Man's Buff.

are found illustrating many of the domestic pieces used in homes to-day, and never fail to find appreciatory acceptances at the hands of young and old. The last being executed about 1785.

In 1780 Wedgwood lost the friend and partner who had been, throughout his life, identified with his success, and his few failures—Bentley, the knight, critic and courtier—and the beautiful tablet erected by Wedgwood, in Chiswick Church, Surrey, England, stands as a lasting testimonial of the duo friendship that was pure and firm. In this year he took into partnership his three sons—John, Josiah and Thomas—and in 1782 he was elected F. R. S., and in 1786, F. S. H. Wedgwood died in 1795, and was buried beside his father and mother, in the old parish of Stoke, near the birthplace of his earlier successes.

The Wedgwood Memorial Institute, at Burslam, completed nearly two years ago, will serve to perpetuate the memory of one who may forever be looked upon as having raised the standard of the ceramic art to the highest possible plane.

9. The Muses.

The department will embrace a school of design, a museum of ceramic art, a laboratory and a free library, while the facade and interior form a composite of the materials emblematic, a glorious tribute to all clayworkers.

W. P. L.

WRITTEN FOR THE CLAY-WORKER.

BUTTON-HOLE TALKS.

ANANIAS WOULDN'T FEEL LONESOME if he were on earth now! He would have plenty of company. He wouldn't be overly conspicuous, wouldn't be worthy of special mention even. He would simply be outclassed. Hold on! Don't get mad! I don't mean you. I don't refer to our own little group of liars. I'm not giving digs at home talent. I mean the generality of mankind in general. What I mean is that there are so many liars loose, and that the art is so well developed, that a man like Ananias, with his simple, old fashioned, record, wouldn't excite comment now."

"Why, the development of the art of lying has been simply wonderful and the supply of high class liars has been actually unlimited. Recruited, as they are, from all walks of life, 'merchant, doctor, lawyer, chief,' each brings in his individual talent, and puts in all the vim and vigor he has into the developing and building up his own individual or professional lie. Not only do they do this in their business or trade, but they carry it into their pastimes and vacations, and we have the golf lie and the hunting lie and fishing lie. Probably of all kinds of lies the fishing lie is the very highest in development and the one on which is concentrated the most talent. So the man who has just returned from a Florida fishing vacation, in which he has been experimenting with seven varieties of bottled bait, and tells stories of fish with three heads and four tails, all done in yellow with red scollops and blue frills, extinguishes the lone home possessor of a tame menagerie of pink monkeys with green tails and azure eyes, that climb in over the footboard of his bed and amuse him nights."

"I've been down there myself. I've sampled those oysters you tell your oyster lies about. I've done my act fishing—yes, and lying, too. Learned one great lesson though that I'll never forget. When you're going to tell a fish lie, run it alone. Don't try to harness it up with facts. Don't trim it with tangible mementoes, but just let it go out all alone and take its chances, and it will stand a much better chance than it would with a lot of facts and accompanying circumstances, awkwardly getting in its way all the time. My lesson came thuswise:"

"I went shark fishing down there and he was a nice,

healthy shark, too, whose works were all in running trim, and he gave me the best fight he had and the best fight I ever had for that matter. He was about five and a half feet long and if he had been an inch longer I would have lost him, that's all there was about that. Anyway, after a big fight, which resulted in skinned fingers, a scared nigger and general excitement, the capture was completed. Never had I captured so big a fish. Flushed with victory I gazed at my prize, fresh from the water, trim, supple and beautiful, and resolved, then and there, to skin him, and far in the north, to exhibit his skin mounted in artistic shape. In connection with him I would put up the usual bargain counter eight ounce rod and silken line to indicate what I captured him with, thinking the clothes line that really landed him would be too gross and conspicuous. Well, I skinned the shark. Long, arduous and exceedingly odoriferous was the task of preparing the skin, but I persisted, until finally dried, rubbed with arsenic and sealed up air tight I sent it north and started up myself."

"I didn't set out to lie. I just kept telling the story and the blame thing kept growing—that is—the size of the shark did. You know how it is, you look into the eyes of your listeners and you see admiration and expectation and you just can't bear to disappoint them, and you just don't disappoint them. Each time the shark was a little longer until at last I myself shivered for fear the horrible thing would eat me so enormous had he grown."

"Then I unpacked the skin, and, to my unutterable chagrin, that blamed hide hadn't been doing a thing but shrinking all the while I was talking, and I couldn't get the skin and the story within hailing distance of each other and had to suppress both."

"No, Gates, just leave out one or the other, keep on lying and bury the skin or else keep the skin and quit l—. Well, there's no use urging the impossible on you and burdening you with impossible instructions. You couldn't do the last, so just do the first, but don't you ever skin a shark."

GATES.

PUNCHING HOLES WITH A RIFLE.

"Up at my camp near the Four Peaks," told Jim Bark, the well-known cattleman, "the boys are all handy with a rifle. We've a lot of guns up there. The old-fashioned black-powder Winchester has been discarded and nothing but the best goes. Most of the new guns were bought during the Spanish war, when we would experiment all day with tree trunks and rough trenches, learning the art of war at home. We found that a bullet from one of the new Winchesters, driven by smokeless powder, was good for four feet and more of pine timber and for more than an inch of iron.

"I thought the boys had done about everything in the shooting line that could be done long ago, but I was mistaken. I sent them up a wagon. In hauling down some firewood they broke the bolsters all to flinders. The bolsters hold up the wagon bed, you know. Well, the boys figured out all right the rebuilding of the wood parts, but came near being stumped on the iron fixings. They got some old iron wagon tires and cut them in proper lengths, but hadn't a way that they could see to punch the necessary bolt holes. Finally the question was solved. One of the boys carefully marked the places for the bolts, stood the piece of tire against a tree and put a bullet, 30-caliber, through the tire at each place marked. It was a novel sort of blacksmithing, but it worked."—The Arizona Grapevine.

THE WISE EMPEROR.

"Think not so much of what thou hast not as of what thou hast, but of the things which thou hast select the best and then reflect how eagerly they would have been sought if thou hadst them not. At the same time, however, take care that thou dost not accustom thyself to overvalue them so as to be disturbed if ever thou shouldst not have them."—Marcus Aurelius Antoninus.

Written for The Clay-Worker.

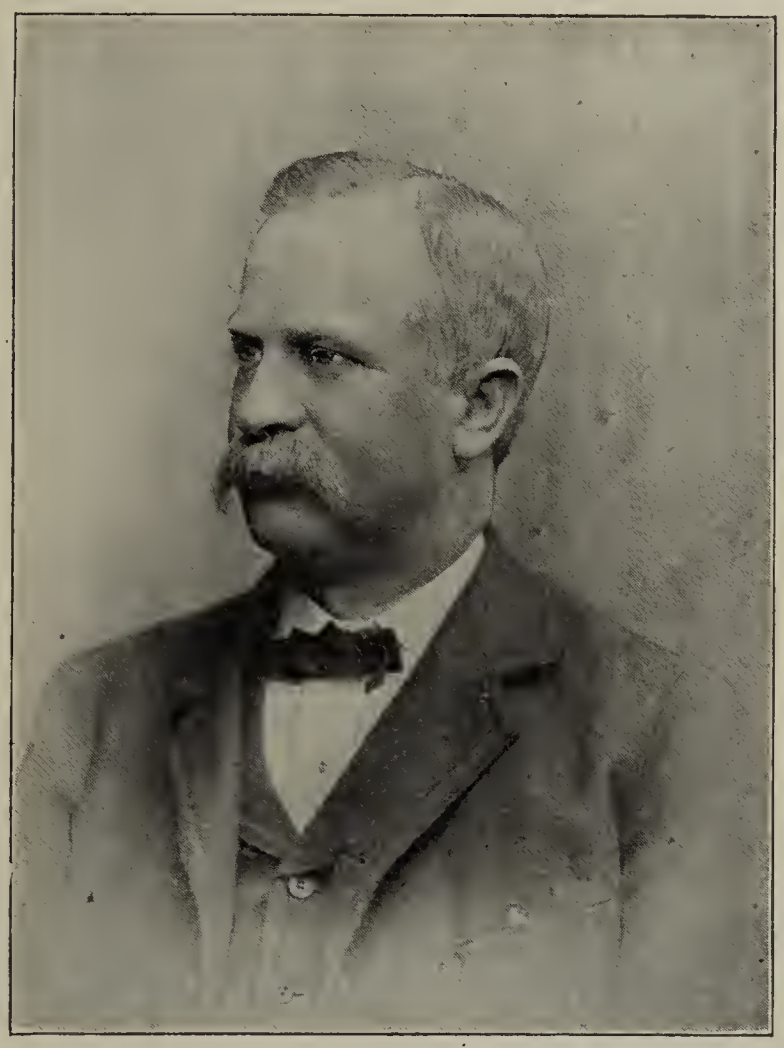
MURREL DOBBINS' SANITARY VITREOUS WARE PLANT

A Distinguished Philadelphia Brickmaker in a New Roll.

THE INVITATION HAS BEEN lying on my desk for some time, so last month I expressed to Murrell Dobbins the pleasure it would give me to run over to Spain—this being the pseudonym conferred on the city of Camden, in the State of New Jersey, by the wandering thespians, who sometimes do a turn in return for the Quaker city dollar—to inspect the new acquisition.

The plant was, I believe, first started by the late James H. Lyons, and was known as the Lyons Pottery Company, the first and only pottery ever established in this vis-a-vis city, connected by the deep waters of the Delaware and a regular line of ferry boats.

In the office I was greeted by T. Munroe Dobbins, Jr., who



Murrell Dobbins, Philadelphia.

although not yet out of his teens, received me and my card with an easy grace and composure that speaks well for his preceptor.

The plant covers an entire city square, and is bounded by Mount Vernon, Chestnut and Orchard streets and the Camden & Atlantic Railroad; or, in other words, about three acres. The tracks of the latter run right into the plant, thus reducing the handling of fuel, material and the finished product to a minimum.

Power is supplied by one of Sciple's stationary side crank engines and pump regulated by a Gardiner governor, and two of Sciple's boilers of 80 horse power each, well located in a broad lighted shed measuring 35x50 feet.

This communicates with the slip house, and one that may be qualified as one of the best in the country—plenty of light,

In the Shipping Department.

Drying a Lot of New Saggers.

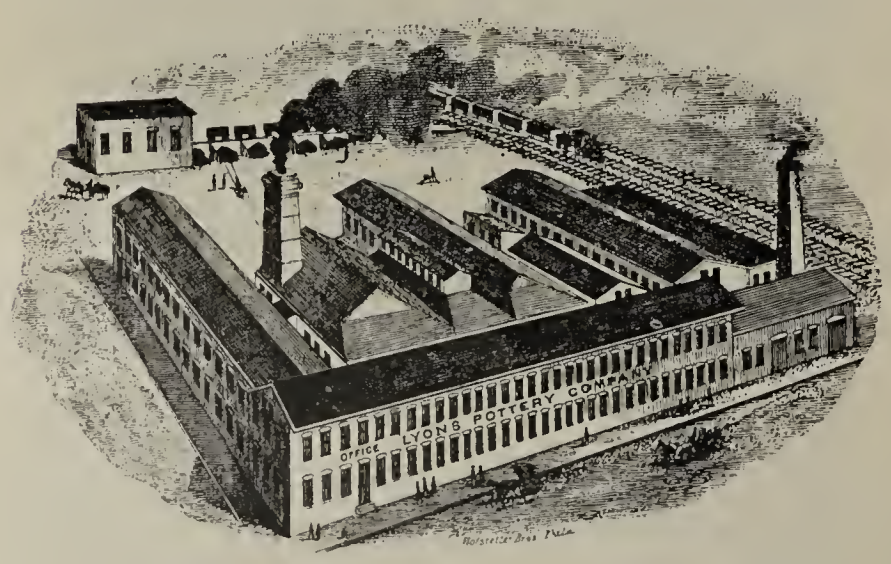
ventilation and space, and the finest acquisition in the way of machinery equipments.

The cars run right into the siding and the clays are discharged into the eight large bins erected on the side of the slip house; thence it is wheeled direct from the bins to the two large double plungers located within thirty feet. The plungers are lined with vitrified brick—made upon the premises—and furnished with grinders, bottoms and chasers of fine French burr stones supplied by the Crossby Machine Company, of Trenton, N. J. From the plungers the mass passes through the lawns, or screens, made of silk bolting cloth, into the agitators, and is then pumped up into the press. From here it is transferred to the clay cellar, where it is allowed to sweat, after which it is again returned to the plunger to be made malleable for immediate use.

Wheeling around we invade the sanctum of the saggers, and view the modus operandi of beating out, and the revolution of the frog pan. By turn, we enter the kiln shed and here, centrally located, are the two square down draft kilns, and the two 18.6 muffled kilns—two for biscuit and two for the gloss work.

In the course of another ten days Mr. Dobbins proposes to erect another muffle kiln.

The green room adjacent is a marvel of cleanliness and



Murrell Dobbins' Sanitary Ware Plant.

order, from its racks, replete with their borders of wads of thick scarlet felt, to the green molded basins, pans and jugs set ready for dipping and firing.

In firing the molds are set one topping the other, with a ¾-inch clay wad filling the interstices.

For gloss works, 22 to 30 hours being allowed for the firing at a temperature of 2,800 to 3,000 degrees, and from 35 to 45 hours for gloss work.

In the general utilization of the spaces Mr. Dobbins has made many improvements, both in area and light, after which order and convenience come as the first essentials.

The office, opening directly from the street, communicates with the shipping department and the glazing room, while to the right and in easy access stands the new kiln shed measuring 34x108 feet; these, by turn, communicate with the saggers and slip house, measuring 40x160 feet.

The vigorous aggressiveness of Mr. Dobbins, coupled with his marked executive ability, has been transmitted to Mr. Dobbins, Jr., who made my inspection a pleasure.

The genial superintendent, Charlie Burchall, who claims little but knows much of pottery workings, spent some years in Trenton consequent upon the knowledge indigenous to the land of his birth, where the men are muscular, mentally and physically, and porridge is eaten with salt, and sugar is scoffed at.

The product at present is confined to the production of sanitary ware and the pay rolls count some fifty hands, but before another presidential election you will hear from me again; and it will read that Mr. Dobbins has more than doubled his working capacity and his output. W. P. LOCKINGTON.

WOMEN AND STRIKES.

A movement has been started in Chicago to form the wives of workingmen throughout the country into unions in order that they may exert some influences on strikes and strikers. It appears to be a praiseworthy object, and a combination of the wives of workingmen rightly directed, ought to be able to prevent much of the harm done by labor disturbances.

When a strike occurs the attention of the public is largely centered on the action of the strikers. Will they be peaceful or riotous, will they hold out long or give in before their object is gained, and what amount of wages will they lose in the meantime are the questions asked by those who are not immediately concerned. Hardly anyone gives a thought to the striker's wife, who sits at home watching with strained anxiety for the outcome of each day's events. She knows that a stoppage of work means a stoppage of wages, and that without wages there is no way of providing food and clothing for parents and children. The pittance allowed by the labor organizations may go a little way for a brief time, but the workingman's wife knows that it will soon stop, and that meanwhile the larder is becoming nearer empty. Added to this is the anxiety as to the personal safety of the husband and father, for labor disturbances are so likely to run into strife and violence. And there is no walking delegate, no labor agitator to encourage the woman to hold out, as there is the man.

The amount of suffering brought to homes and to women, especially by strikes, is incalculable. Knowledge of only a small share of it reaches the public. It is reasonable, then, that as workingmen's wives are the chief sufferers from labor disturbances, they should have something to say about their beginning, direction and duration. If they were consulted, doubtless many strikes would be avoided. They could find a

way by their quick wit of compromising or amicably arranging differences between employer and employe, when the same end is reached only after weeks of waiting, loss, anxiety and strife. Unorganized they cannot do this, as not many workingmen are used to consulting their wives before acting. But formed into unions, with their influence concentrated and well directed, much good could be accomplished. The tyranny of the strike might be broken, and the will of enough vacillating workingmen steadied to prevent the beginning of unnecessary labor troubles and to end others which have become hopeless. The result would be less friction between capital and labor, and the awakening of a better feeling among all concerned in the labor situation.

Women are the worst victims of strikes. They have to endure most of the hardships resulting from these agitations. There is every reason, then, why they should organize to end them, or at least to lessen their frequency and duration.—Philadelphia Press.

Written for THE CLAY-WORKER.

AMONG THE PITTSBURG CLAYWORKERS.

THE REESE-HAMMOND Fire Brick Company, whose plant is one of the largest in the Pittsburg district and is located at Bolivar, Pa., on the Pennsylvania Railroad, is running night and day, turning out the varied brands which they furnish. Among the contracts lately secured by this firm are several foreign ones and also one for supplying brick for a Colorado smelter.

The Harbison-Walker Company have made a number of decided improvements about their plant and it is now one of the most complete brick plants about Pittsburg. Like all the other industrial concerns in this district this plant is well supplied with the big contracts.

A representative of the Brazilian government was a recent visitor to the brick manufacturers of Pittsburg. He came for the purpose of placing an order for fire brick for use in the new forts being built in the harbor of Rio. The brick are to be used for the arching and lining work.

The extensive fire brick works located at Keystone Junction, near Myersdale, on the B. & O. Railroad, were destroyed by fire a short time ago. Over 200 employes were thrown out of employment and the loss is placed at $50,000.

The American Clay Manufacturing Company, of this city, has filed a bill in the courts here asking for a decree to compel the American Clay Manufacturing Company, of New Jersey, to change its name. The similarity of names has caused much confusion, especially in the mails of the two concerns.

The recent meeting of the American Potters' Association in this city was one of the most notable gatherings in the interests of the clay industries ever held in this city. It was attended by representatives from every factory of any consequence east of the Mississippi. Among other business transacted was that of fixing the annual price lists.

Probably one of the busiest branches of the clay manufacturing industry in western Pennsylvania is the silica brick industry. There are now some ten or twelve firms in the silica business in this district, and other concerns are contemplating entering this line of the clay industry. The mountain ranges bordering the western slope of the Alleghenys afford the finest kind of silica rock and as yet there are many high grade deposits which are unworked. In some places options have been taken on these deposits. During the next few months there are certain to be some important developments in the silica brick industry in this district.

The Wittmer Brick Works, at Wittmer station, is filling several large contracts. This is one of the well-established plants in the Pittsburg district, as well as one of the most complete.

Plans have been about perfected for the $3,600,000 addition to the Carnegie Institute in this city. The addition will entail one of the largest fire brick contracts given out in this district for some years.

The Ligonier Silica Brick Company, through their Western sales agent, have just placed a large contract for silica brick with a large smelting company in the Cripple Creek gold field.

The new additions being made to the Carnegie Steel Company's plant, at Homestead, involved a large brick contract. The many other additions being made to the manufacturing plants of this city has caused an unprecedented demand for all kinds of brick. To supply the demand quite a number of new concerns are entering the brick business. Already a number of new plants have been put in operation and others will be completed in a very short time.

The Booth & Flinn Company, of this city, have secured some large street-paving contracts here. For years this firm has been the leading one in this business, and most of the paving in this city has been the work of this firm.

The Garfield Fire Brick Company, whose plant is located near Bolivar, on the Pennsylvania Railroad, east of Pittsburg, is devoting considerable time to the manufacture of silica brick. Its supply of silica is obtained from the silica deposits in Ligonier valley.

In the construction of the new system of retort coke ovens by the Laughlin Company, of this city, a new idea in the shape of brick stacks has been introduced.

A new brick structure will be erected by Armstrong & McKelvey, of this city, to take the place of the old structure, which collapsed some time ago with disastrous results.

The brick work on the new plant of Spang-Chalfant & Co., at Sharpsburg, is nearing completion.

The American Steel & Wire Company is at present engaged on the brick work of its great plant on Neville Island, in the Ohio. All the plants of this concern in this district are to be centralized on Neville Island. GILBERT.

MURRELL DOBBINS' SANITARY WARE PLANT—The Well Lighted Slip House. The Kiln Shed.

WRITTEN FOR THE CLAY-WORKER.

BRICK PAVEMENTS IN GREATER NEW YORK.

Brick Pavement in the Boroughs of the Bronx and Queens.

By G. W. Tillson, C. E.

THE BOROUGH OF THE BRONX consists of all that part of Greater New York lying north of the Harlem River and between the Hudson and Long Island Sound. It was formerly the Twenty-third and Twenty-fourth wards and prior to consolidation its public works were carried on by an organization separate and distinct from that of the city proper. The commissioner was the present president of the borough, Mr. Haffen, and the chief engineer, Josiah Briggs, who, when the department of highways was organized under the new charter, was made engineer of that department for Bronx borough.

This borough has an area of 25,270 acres, and its pavement mileage is as follows:

Specification granite	33.29 miles.
Specification trap	7.92 miles.
Belgian trap	.27 mile.
Sheet asphalt	9.19 miles.
Macadam	93.60 miles.
Brick	1.00 mile.
Total	145.27 miles.

It will be noticed that out of 145 miles of pavement only one mile is of brick. In a borough, too, where all the pavements are comparatively new. The reason of this is plain. The entire eastern section of the country is naturally for stone. Their idea of permanency and durability in construction is stone, so it is natural that stone, available as it is on account of cheap water transportation, should be largely used for pavements. When it comes to the question of smooth pavements the people are now for asphalt. This is the result of education. Asphalt has been laid for many years and they can see for themselves that it is smooth. They know very little about brick, as a paving material, and when brick are spoken of naturally think of the ordinary building brick. Of course the people are meant by this and not the officials. But as the people pay for the entire cost of new pavements they are consulted as to the material used and their wishes rightfully govern as a general rule.

—Importance of Uniformity of Brick.—

The Bronx is an almost ideal place for brick. It is a residential district; it has many steep grades and a durable smooth pavement is just what is needed. But it will require a campaign of education to teach the people what a brick pavement is. They are naturally conservative, and particularly so where their pocketbooks are concerned, but when once convinced remain so.

Mr. Briggs, upon being asked for his opinion of brick as a paving material, replied as follows:

"It is rather difficult for me to pass judgment on brick paving, as yet, with my small experience. I do think, however, that under the best possible conditions of supervision, etc., brick pavement is a good thing. You must first have a perfectly settled and solid roadbed for a base, then a good concrete foundation with a sand cushion of uniform thickness. The bricks should be similar composition and color and burned to an even hardness—this is the most serious difficulty—and they should be laid to a perfectly smooth surface. Any unevenness produces a shock which causes rapid disintegration under heavy traffic. After the grout is run into the joints there should be no disturbance until the cement is thoroughly set. With these points all carefully secured and with possible others which I probably do not think of now, a brick pavement ought to last in very good shape nearly as long as a granite block pavement. I think the greatest difficulty is in securing exact uniformity in hardness of the brick, and this is a great if not the greatest menace to the life of the pavement."

Jerome Avenue, looking East from the Harlem River.

It will be seen that if Mr. Briggs has not had much experience with brick pavements he has diagnosed the case accurately. He has evidently studied the situation very carefully. To fully appreciate his comparison with granite, it must be understood that in this section that material is taken as the standard of durability. It is not expected to find a material that will be better than this.

Brick manufacturers will do well to consider what Mr. Briggs says about the uniformity in the hardness of the brick. The failure of one brick pavement will do more harm, when an educational campaign is carried on, than a half dozen successful pavements will do good. It is unquestionably a hard task for an inspector to decide just what bricks should

Courtland Avenue, between 160th and 161st Street.

be used and what should be rejected, when they run from bad to good, especially if, as must be the case here, he has had but little experience in this class of work. An experienced inspector, too, is often puzzled when a new make of brick is offered. The remedy, however, is plain. The manufacturer should send out nothing but first class brick. It is good business to say nothing about honesty. All business houses in these times of bitter competition recognize the fact that it

is policy to carry on their transactions carefully and honestly. The manufacturer knows his product now; he was not sure, perhaps, a few years ago; he can tell the good brick from the bad, and there is no excuse for the shipping of any soft, malformed, or otherwise defective brick. As has been said before this section of the country draws naturally upon stone as a

Webster Avenue, near Bedford Park.

paving material and positive proof will be required to change this tendency.

The cost of brick pavement in the past has made competition with asphalt difficult, but with the prices bid for asphalt the first of the month, $2.06 per square yard in Manhattan, and $2.35 in Brooklyn, with a guarantee for ten years, not including the concrete base, brick ought to have a better chance.

The accompanying view shows Jerome avenue, in the Bronx, near the Harlem river. This pavement was laid in 1898, of the ordinary size Mack brick, with close joints, filled with Portland cement grout. As is seen in the cut there is a street car track in the center. The bricks were laid a little above the head of the rail on the outside and even with it on the inside.

Webster Avenue at Fordham, looking South.

The pavement is in almost perfect condition and is good for a long life.

Courtland avenue is on the east side, and runs from One Hundred and Forty-sixth street northerly to One Hundred and Sixty-third street. It is paved to One Hundred and Sixty-first street with asphalt, except the last block, where there is quite a grade upon which it was deemed best to lay brick. The view is taken looking north, and shows asphalt strips next to the curb, for the benefit of bicyclists, although it is very doubtful if they ever turn from the brick, which is practically as smooth, to the asphalt. These bricks were the same as those used on Jerome avenue, except they had round corners, so that now they show apparently more wear than the others, although it is very slight at the most.

Webster avenue is a wider thoroughfare, connecting the little village of Fordham with Bedford Park. The roadway is 70 feet wide, with street car tracks the entire distance. On the lower portion the tracks are located near the east curb, leaving a clear space of about 50 feet. This pavement was laid with the Mack blocks, with lugs, on the sides to separate the blocks and corresponding grooves to receive the cement grout. The corners of the blocks were rounded off to prevent chipping. In speaking of this feature of the blocks, as well as the lugs for separation, Mr. Briggs says, in his opinion, there is less chipping at the joints with square bricks, laid as closely as possible, than with the rounded edges and the bricks somewhat separated. The writer would agree with this opinion, as he thinks that a pavement is more solid and compact when laid with tight joints. However close the joints it is always possible to run cement grout into them and the thinner the cement the better. With rounded corners, too, it is more difficult to maintain a full joint at the surface as the thin edge of cement where the curve ends on the top of the brick is easily broken. The argument of the other side is that the corners are bound to chip off and it is better to make them round and have smooth and true a shape which will soon be made rough by traffic. The writer does not believe it is necessary to have chipped off corners. The construction to be aimed at is one with a solid base and the joints filled with a composition that will maintain itself and wear evenly with the brick. That is one of the provinces of the cement joint, and unless it does that it is not performing its entire work. That this is often so is true. One reason for this is because the cement is not allowed time enough to acquire its complete set, when, of course, there remains what is practically a sand joint. Webster avenue was graded and sewered but a short time previous to the paving so that some slight settlements have occurred, and the surface is not as smooth as it otherwise would have been. This pavement was laid in 1897 and shows practically no wear where the bond of the cement was not broken. All of these pavements were laid on a foundation of six inches of concrete, with a sand cushion of two inches. Engineers vary in their practice in respect to this sand cushion. Its object, of course, is to give an even bearing to the brick, and when this is accomplished the thinner the cushion. The amount will depend upon the smoothness of the concrete. If the broken stone be fairly cubical and uniform in size a concrete should be laid so smooth that a one-inch cushion ought to be sufficient. Any extra depth makes more possible a settlement in the cushion, causing a cavity large enough to produce the much complained of rumbling under traffic.

—Borough of Queens.—

Queensboro consists of all that part of Queens county situated in Greater New York. It comprises an area of about 124 square miles. In it are located Long Island City, Flushing, Jamaica and many other villages which, in some States, would be quite respectable cities. The pavement of Queens, according to the report of the Highway Commissioner for the quarter ending December 31, 1899, consisted of:

Granite block	29.24 miles.
Belgian trap	6.64 miles.
Asphalt	3.00 miles.
Brick	14.30 miles.
Cobble	30 miles.
Macadam	383.54 miles.
Gravel	13.68 miles.
	450.70 miles.

It will be seen that here brick makes a good showing

among the real pavements. A great portion, practically all, of the macadam consists of roads only, where the center portion is improved without curb or gutter. Just previous to consolidation nearly all of these towns and villages issued bonds to raise money for the improvement of their streets and roads fearing that they might not receive much attention after they became a part of so great a whole, so that in 1897 a large amount of work was done, all of the 14 miles of brick pavement having been laid in that year.

—Brick Streets at Far Rockaway.—

It is very encouraging to note that when the popular move was to get a large amount of work cheaply, thin macadam being laid in narrow strips, some of the people were willing to spend their money on permanent improvements. A notable case of this is Grand street, in the old village of Newtown, extending from Juniper avenue to Court street, a distance of 1.33 miles. The fire clay Mack brick were used and laid on a concrete foundation. This street is now in an excellent condition and can be relied upon to prove the good judgment of the people who were responsible for its selection.

But, perhaps, the best instance of brick pavements in Queens is Jamaica avenue, from the old city line of Brooklyn to the village of Jamaica, a distance of nearly five miles. Alternative bids for asphalt and brick were received and brick finally decided upon. In Jamaica, and for a distance of two miles in Brooklyn, this avenue is paved with asphalt, so that there is a five mile piece of brick between two asphalt pavements. This will afford an excellent opportunity to judge of the relative merits of these two materials. This pavement was finished in December, 1897. It was laid on six inches of cement concrete, with Portland cement joints. The material was the Mack block, with lugs and corresponding grooves. This pavement sustains quite a heavy traffic for such a location, as it is largely used by market gardeners bringing in their product to the Brooklyn market. As the view shows, there is a double line of street car tracks in the center of the street. The rails are the ordinary deep girder rail, with a flat tram about an inch below the head. Specially formed blocks, to form a groove, were used both inside and outside of the rails. The success of this expedient is doubtful. The heavy trucks have displaced and worn these special blocks so that in many places there are ruts next the rails on the inside. The weather being so cold when the work was done it is possible that the concrete was not set sufficiently where the travel was allowed on the street. But it is a generally accepted fact at the present time that an improved pavement calls for an improved construction of the street car tracks. When the officials of Sioux City, Ia., decided upon a system of improved pavements, in 1897, the Street Car Company, with commendable enterprise, determined upon a permanent track construction. A T-rail was adopted, laid upon a concrete beam, with steel ties. In the brick pavements the brick were laid within an inch and one half of the rail and the space filled with an asphaltic cement. A car was then run over the track, forming the groove in the asphalt. This construction has proven very satisfactory. With a tram rail the best results will be obtained by filling the space between the web and edge of the rail with cement or tar, and then laying the brick in mortar upon the concrete. If this method be used no settlement can occur.

Far Rockaway is a watering place, situated on the sea, about twenty-five miles from New York. It has a large increase of population in the summer months. The principal street is Central avenue, running by the railroad station southerly to the sea. This avenue was paved with Mack brick, in 1897, on a sand base with sand points. This pavement certainly presents a strong argument in favor of sand as a foundation. Its surface is almost as smooth and even as when laid. It shows a few depressions, but they are all so regular that they impose no extra wear on the brick. It must be remembered, however, that this seashore sand is different from the bank sand farther inward. It is absolutely clean, so that when placed in a foundation it has no appreciable settlement. It is so fine, too, that even when the brick are laid so closely together as possible the joints can be absolutely filled. On a portion of the avenue there is a street car track. Between the rails the pavement is laid practically on a level with the tram and below the head. This is a good arrangement for the brick but bad for the street, as it considerably obstructs the cross traffic. Where there is not much of this travel it is, of course, not so important.

FAR ROCKAWAY—1. Central Ave., looking North from the Sea. 2. Central Ave., near Long Island R. R. Station. 3. South Street in front of Tack-a-Pan-Sha House.

It may be claimed that the reason this pavement looks so well is because the travel is light. This may be so to a certain extent, but it illustrates very forcibly the point, that brick is so well adapted for pavements under such conditions as exist here. It is the only material that will give a smooth pavement according to the amount of traffic it sustains. Asphalt and wood have a life independent of the traffic; that is, the action of the weather will destroy them in time even if not used at all. But brick can only be worn out and its life will have its length governed by the traffic. When Central avenue reaches the sea South street branches off at right angles and extends along the shore. The first block is paved full width, but when the street widens out only the half of the roadway adjacent to the hotels, is improved. The width, however, is enough for general use.

The only adverse criticism one could make on the improvements is that a wooden curb has been used on a large portion of the streets. It was evidently in place when the bricks were laid for it is even now badly decayed and in a few years

will be practically gone, when the pavement will be as good as ever.

It will be very difficult to find another piece of pavement that has been laid three years that presents as uniformily a good appearance as this. Its surface has been well maintained and the bricks have chipped very little. At one place in the gutter, in front of a butcher shop, the bricks are considerably worn. This was undoubtedly caused by the horses of the delivery wagons "stamping" flies in the summer and bears out the contention of so many enginers, my own among the number, that

Jamaica Avenue, Borough of Queens.

the impact of the horse shoes does more damage to the ordinary brick pavement than the wheels. Far Rockaway is to be congratulated on her selection of paving material.

Written for The Clay-Worker.

SOME COSTLY BITS OF EXPERIENCE.—No. 5.

L. C. Moore.

WE BEGAN THE TILE BUSINESS as pioneers in our part of the State. We had not only to educate ourselves upon the subject of manufacture, but also carry on a campaign of instruction to our prospective customers. We did not wait for a demand to call forth the production of drain tiles, but set to work to make them, believing that such a good thing would not have to beg for a market.

But we had an immense amount of prejudice to combat, and an opinion prevailed in our county that underdrainage would prove a failure on our prairie lands, because the clay subsoil was impervious to water. In spite of the well-known success of tile in adjoining States, there was a well settled doubt in the minds of our people, and their preconceived notions were no less difficult to remove, because they had no foundation, in fact.

We waited long and as patiently as we could for customers, but four years elapsed before the tile trade gained a proportion to be dignified by the name of business. But tiles required no shelter to keep them from decaying, and they lay upon the yard all these months, while we urged upon our farmers the great advantage it would be to them to tile, at least, their swampy lands. We offered all kinds of terms as inducement to them to purchase and give the tiles a trial, for we would rather the tiles were in some ones ditches than have them lying upon our yard, even if payday was a long way off.

At last we got our first customers. Some neighboring farmers decided to attempt to drain some swampy ground, and bought 2,000 four-inch tiles at $15.00 per thousand. That was an enormous sale, and we agreed to wait six months, without interest, for our pay. But it was a beginning, and we knew that "From small acorns great oaks do grow," and we were glad to look at the vacant space left after loading out those 2,000 tiles, although it did not for the time fill up any vacant space in our pocketbook.

The tiles were sold, and now a very weighty question came up for solution. How should the tiles be laid? Could one tell by his eye about the slope of the land, so that the proper fall might be given? For we all agreed upon one proposition, viz.: They would not carry water up hill.

We had had no practical experience in the business, but one who has taken The Clay-Worker for several years ought to be pretty well posted on all matters pertaining to bricks and tiles. We advised the procuring the services of a surveyor and doing the work on correct principles of engineering. But our customers thought that they had expended so much money for tiles, and the ditching would cost still more, and, of course, to hire a surveyor at 50 cents per hour was an extravagance that was out of the question.

Besides, could they not tell up hill from down hill with their eyes? Their ditches were to be run from the low land to a small stream near by. They commenced at the stream to dig the first ditch, and headed straight for the swamp, allowing considerable fall to the ditch. After several rods of the ditch was completed, they began to lay the tiles and cover them up, for they feared the frequent overflow of the stream might cause the banks to tumble in.

The ditch was not over one-half completed when they discovered that they would be unable to reach the swamp if they continued the grade with which they started. So they changed the grade to a less fall, and continued their work. But at last the full truth dawned upon them. They had not commenced the ditch deep enough at the outlet, and they could not drain their swamp without taking up and doing over all the work thus far completed.

It was a costly bit of experience, but they went through it and did a good job before they left it. The next year they could plow that swamp when their high ground was too wet to cultivate. This was a good advertisement, and our demand began to assume proportions that made matters move satisfactory. But all of this work was done on swampy land, in small patches; our largest customers buying only a few thousand feet.

Again we urged farmers to follow common sense rules and cease their crazy-quilt methods. We advised them to adopt a system of tiling suited to the situation of their entire farms, and whatever tiling they might do in a small way would fit into the general plan when they came to tiling on a large scale, which we knew would be the case as soon as they saw the effect of drainage upon their lands. But again our arguments went for naught, and the only pay we ever got for our advice comes now and then when we tell the old customers, "I told you so." All of these short drains now have to be taken up because they will not fit into the plans now made to drain large tracts of land.

It was of as much importance to us that the work should be properly done as it was to the farmers. One poor job did us a great deal of damage, while work well done was a greater advertisement than we could get by any other means. There is one farm in an adjoining county that was tiled in a very thorough manner; no expense being spared, excepting for the services of a surveyor. This land was tiled several years before we went into the business, and the tiles were made in an adjoining State. After a number of years' trial, the drainage was accounted a failure, the tiles were dug up and piled in fence corners and vacant lots. We have never been able to sell a single tile in that neighborhood because "it won't work there." It works all right on all sides of them—on the prairie or in the river valleys—but for some reason, which the farmers of this particular community cannot explain, tile drainage is a failure there. On all sides of them we slice off a customer now

and then, and gradually this undrainable region is narrowing down until we hope soon to reduce its area to the farm which originally caused all this loss by having its drains laid with their discharge end higher than the source. Much of the work here is let by contract, and the contractor slights his work often in a shameful manner.

But gradually they are learning by costly experience that work well done soon pays for the extra expense for having it done.

(To be continued).

Written for THE CLAY-WORKER.

EXACT INSTRUMENTS FOR CLAYWORKERS.—No. 2.

—Instrument for Measuring the Velocity of a Current of Gas Passing Through a Flue or Stack.—

IN DETERMINING the volume of a gas passing through a flue in a given time it is necessary to know the cross section of the flue and the velocity of the current of gas per unit of time. The velocity multiplied by the cross section will give the volume of gas passing through in cubic meters or cubic feet as the case may be. The instrument used for determining the distance traveled by the current in a given time (Fig. 7) is very simple in construction and very easy to operate. It consists mainly of a fanlike wheel, geared to a clockwork, indicating the distance covered by the flow of the gas.

Every instrument is tested before leaving the shop, and a proper correction made for the inertia and friction of the instrument itself. This correction is expressed by a number called the constant of the instrument and is marked upon every anemometer, the name of the apparatus. The mode of operating it is very simple and may best be illustrated by an example. Let us assume that the correction per minute is 30 and the last reading, say 1,000. On taking the instrument and releasing it exactly at a noted time the wheel will begin to revolve and move the clockwork. By stopping the motion after a given time, say two minutes, the distance traveled by the gas in the flue will be indicated.

Supposing that the reading is now 3,060. Subtracting the correction for two minutes, which is 60, we obtain 3,000 as the proper reading. Since the first reading was 1,000, the difference of 2,000 will evidently be the distance traveled by the gas in two minutes. Hence, the velocity of the current per minute is 1,000 feet, or meters, depending upon the unit of length used in standardizing the instrument. There are, however, anemometers connected with a clockwork in such a manner that they will run exactly one minute, and thus indicate the velocity of the current without any calculation, since after every reading, the indicator returns to the zero of the dial.

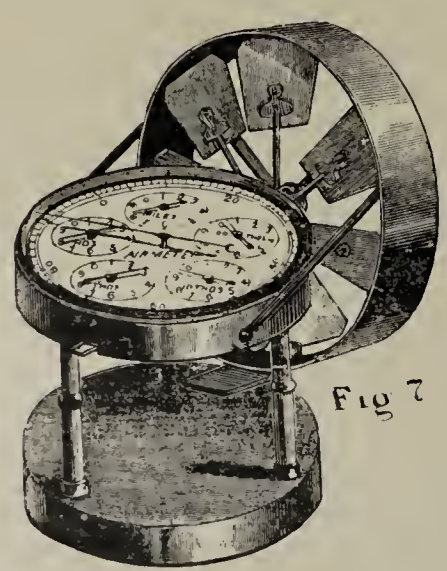


Fig 7

Fig 8

The instrument must always be in the current to be measured so that the plane of the wheel is at right angles to the direction of the gas. Since the device is quite delicate, it cannot be exposed to very hot gases, which would destroy it.

—Draft Gauges.—

It is often very desirable to possess a definite numerical expression for the intensity of draft in a stack, so as to permit of a closer regulation than is possible without any exact knowledge of the draft conditions. Draft, as we all know, depends upon the difference in weight between cold and heated air. Every stack evidently represents a column of air corresponding to its height and cross section. On being heated the air within the stack expands and hence the volume filling the space represents less weight than did the cold air.

The higher the temperature the greater will be the expansion of the air and the less the weight of the heated column of air. Now the draft depends simply upon the difference in weight between the two columns of cold and heated air. The outside air being denser and heavier tends to fill up the rarefied space of the stack, and in so doing causes a pull toward the stack proportional to the difference in temperature between the outside air and that within the stack.

For example, assuming the outside temperature of the air to be that of the freezing point and supposing a stack to have a volume of 1,000 cubic feet, we start with the fact that this column of air at the above temperature weighs 80.9 pounds. By heating the stack to 523 degrees Farenheit we double the volume of the air by expansion and hence decrease the weight of the 1,000 cubic feet by one-half. We have now within the stack a column of rarefied air weighing about 40.5 pounds. However, since the outside air is twice as dense, a state of difference in pressure is established and a force equal to the difference in weight between 1,000 cubic feet of cold and heated air, that is, 40.5 pounds, is exerted towards the stack.

The instruments used for measuring draft are extremely simple in principle. A description of the simplest possible type will make clear the working of all of them. A U-shaped glass tube partially filled with water, or a lighter liquid, will serve admirably for this purpose. When open to the air at both ends the levels of the liquid will be at the same height in both legs of the tube, but on connecting one end to a hot stack while the other is open to the ouside air, the pressure of the latter will force the liquid up in the leg communicating with the stack. The stronger the draft the greater will be the difference in level and by measuring this difference a numerical expression for the draft is obtained.

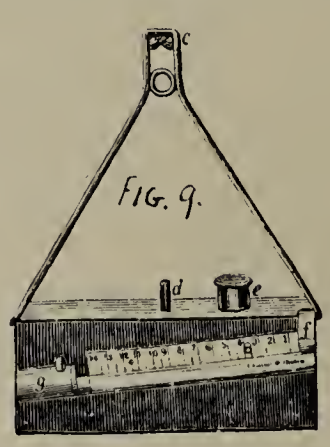


Fig 9

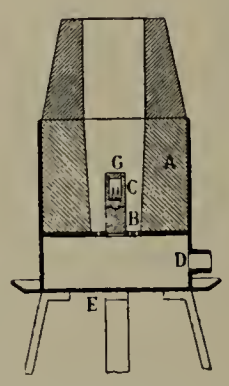


Fig. 12.

The instruments used for this purpose, without exception, correspond to this principle, but all of them are provided with devices for magnifying the reading so that even very small fluctuations in draft will be readily detected. For this purpose either the top of the U tube is enlarged so as to magnify the reading in proportion to the ratio between the diameters of the wide and narrow tube, in which case two liquids which do not mix and are of different colors must be used, or an inclined tube is applied in connection with a metal box filled

with petroleum or any other liquid. Figures 8 and 9 represent both types of draft gauges.

—The Platinum-Rhodium Pyrometer.—

For measuring temperatures higher than can be measured by means of mercury thermometers, the electric pyrometers, especially the one introduced by Le Chatelier, are the most accurate. There are two types of electric pyrometers—one depends upon the fact that the electrical resistance of a platinum wire increases in proportion to the temperature, that is, by measuring the increase in resistance the temperature may be determined. This is the principle adopted by Sir Siemans. The second type is based upon the fact that an alloy of rhodium and platinum, when exposed to heat, produces an electric current whose strength is proportional to the temperature. By measuring the strength of the current the number of millivolts can be used to determine the temperature.

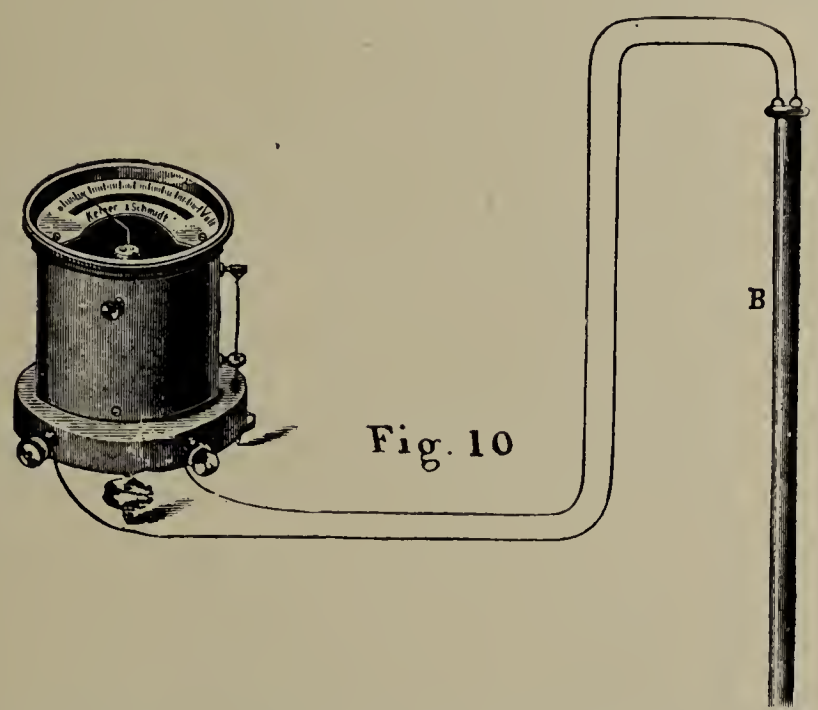


Fig. 10

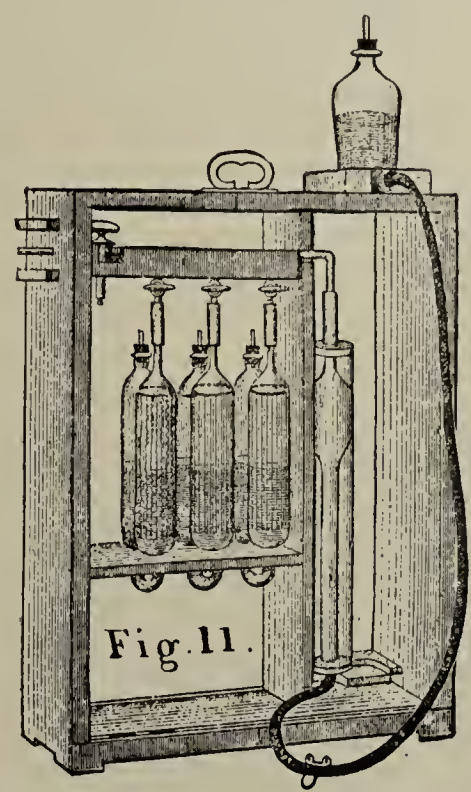


Fig. 11.

The instrument (Fig. 10) consists essentially of two parts, the thermo couple, at the end of a loop of platinum wire, and galvanometer. The first generates the electro motive force, the second measures it. In using this instrument it is not necessary to have the galvanometer, which in the nature of the case is a delicate piece of apparatus, at the place where the couple is inserted, but it may be set up in an office or any other convenient room, from 60 to 100 feet away from the kiln.

The couple itself, consisting of a little ball of metal attached to the loop of platinum wire, is protected from direct contact with the flame by means of a porcelain tube, since platinum would be destroyed by the action of the fire gases. The platinum wire projecting out through the kiln wall is connected with the galvanometer by means of ordinary insulated copper wire.

After the platinum wire with the couple has been placed in position, projecting from eighteen inches to two feet into the kiln, and being protected by the porcelain tube, which again may be surrounded by an ordinary fire clay tube, the instrument is ready for use. The work of placing the couple in position need not take longer than five or ten minutes. In order to simplify matters the galvanometer is provided with two scales—one for reading the millivolts, the other for reading the degrees of temperature expressed in centigrade degrees. Thus, one can note the temperature at a glance and is thus enabled to watch the progress of the heat or to observe the rate of cooling with the utmost accuracy.

By having several thermo couples and a switch-board arrangement, more than one kiln can be controlled in this way without any trouble. Of late self-registering pyrometers have appeared on the market, and it will not be long before they can be had for practical use at a reasonable expense. While the electric pyrometers require, of course, intelligent treatment they are simple enough in operation to be used successfully by every clayworker.

—Instrument for the Examination of Kiln Gases.—

Everyone knows that the process of combustion is a chemical process, consisting mainly of the transformation of solid carbon to the gas called carbonic acid. The more complete this process is and the less air has been used for it the more efficient is the combustion from the economic standpoint. In other words the higher the per cent. of carbonic acid the more efficient is the method of firing. Theoretically, the fire gases resulting from perfect combustion should be composed of 79 per cent. of nitrogen and 21 per cent. of carbonic acid. Of course this is impossible in practice, but we should always aim to approach this ideal as closely as possible.

But how are we to determine the composition of the fire gases? An instrument designed for this purpose is shown by Fig. 11, the so-called Orsat apparatus. In its use it does not require an extraordinary degree of intelligence, but anyone may make himself familiar with its operation. It determines three principal ingredients of the kiln gases—carbonic acid, oxygen and carbon monoxide. The first, as we know, represents the final product of the change from carbon to the gaseous form, that which gives out the most heat. The second, oxygen, if present in a fire gas, shows that either too much air has been admitted to the kiln, or the air and the gases resulting from the coal have not been thoroughly mixed. In either case a loss of heat is indicated, since, in complete combustion, with the theoretical amount of air, no oxygen is left over. Hence, the presence of oxygen indicates a loss of heat. The third, carbonate monoxide, is a half-way station between carbon and carbonic oxide, showing that there was not sufficient oxygen present to burn all of the carbon completely. Carbon monoxide, being able to use more oxygen, shows incomplete combustion and lack of air.

These three gases are determined quite readily in the Orsat apparatus, the operation being based upon the fact that each gas may be absorbed by a certain liquid, something like a sponge does water. A solution of caustic potash will readily take up carbonic acid, an alkaline solution of pyrogallic acid will absorb oxygen and the carbon monoxide is taken up by an acid solution of cuprous chloride. The mode of procedure is as follows: A definite amount of gas is drawn from the kiln into a graduated glass cylinder by means of porcelain and rubber tubing.

The cylinder holds exactly 100 cubic centimeters of gas. After closing up the glass stopcock communicating with the kiln the gas taken in is allowed to flow into the first of the glass bulbs, filled with caustic potash. This is accomplished by forcing the gas over by means of water from a bottle, which is held in the hand. In the first bulb the carbonic acid is absorbed. On letting the gas flow back to the cylinder it will be found to have contracted in volume, that is, it will be less than 100 cubic centimeters.

(To be continued.)

WRITTEN FOR THE CLAY-WORKER

THE BOND OF BRICKWORK.

IT IS A MATTER of great importance to the brickmaker that bricks be well laid and well bonded. The bond primarily depends on the cohesive nature of lime mortar. If the bricks are wet when laid the mortar will adhere whether the brick be smooth or rough. Masons generally are of the opinion that mortar will adhere better to a rough brick than a smooth one. This is probably owing to the fact that a rough brick can be rapped to place with less liability of breaking the bond of the mortar.

A smooth dry brick allows but little movement and it must be quickly made, or the brick will slip on the mortar and must be relaid with fresh mortar. In rapping a rough surface brick to line the mortar moves with it, but this is no evidence that the mortar, when set, will adhere more strongly to the rough brick.

One would naturally think that the air confined in the interstices of a rough surfaced brick would in some degree prevent the adhesion of the mortar. This would undoubtedly be the effect if the brick were not porous, so that the air could not escape through the brick. But the tenacity with which mortar adheres to glass, a perfectly smooth and non-absorbent body, is evidence that brick may also be smooth and nonabsorbent and make equally as good a wall as rough brick.

One need not be a very close observer to learn that in the taking down of brick walls some brick will lift easily from their places, leaving a smooth and perfect mold of the brick in the mortar, while others have to be struck with a force that frequently breaks them in pieces, and, if lifted without breaking, take a portion of the mortar with them covering the whole surface of the brick; the separation being in the mortar and not between the mortar and the brick.

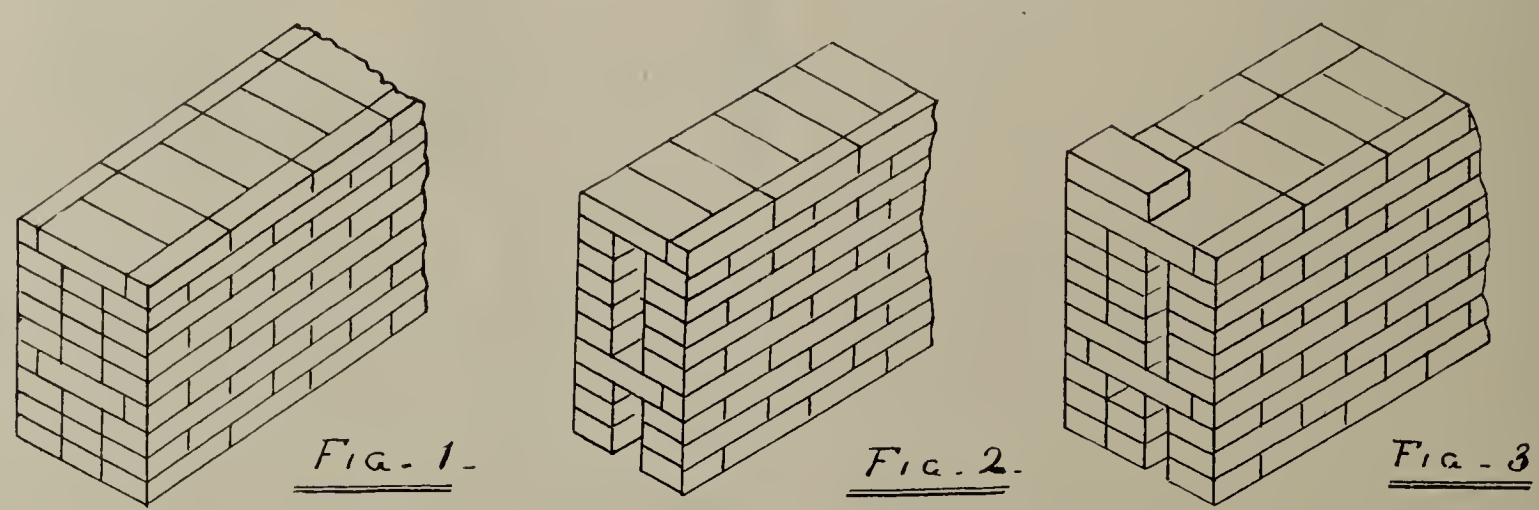
What makes this difference is a very important question. The defect has been attributed generally to the laying of dry brick. But the remedy has been known so long and is so simple that we are assured that other causes may produce this effect. Is not mortar oftentimes used in too new a state, that is, before the perfect working and mixing of the sand has been made? Is there not a giving off of gas from the mortar in the joint also a cause for this weakness?

It is more important to lay a brick under such conditions that the mortar will make a good bond than to make a true, smooth wall. What matters it how well the wall may look, if, in a short time, the arches crack and the sections slip by each other, not only presenting a very unsightly appearance, but proclaiming that the structure is unsound from cellar to garret. It might be profitable to consider the question, "Can a good mortar bond be secured when bricks are laid hot and the mortar freezes soon after the brick are laid? Is not the practice of building brick walls in the winter very objectionable?

If a brick wall is expected to withstand the ravages of fire the sand in the mortar must be a flint sand. A limestone sand will, of course, turn to lime and the slacking of the lime will break the mortar bond and disintegrate the mortar. Brickmakers who have unwittingly used lime sand in their clay for making brick will appreciate the importance of this warning. A sand that is affected by the action of acid will also be affected by the action of fire.

The steel structures in which the girders and posts are partially protected by fire-proofing have, in some degree, disappointed expecations in regard to their fire-proof qualities, although practical men could plainly foresee that, if there was enough combustion to heat the lower part of such a building to redness, the whole fabric would collapse. The steel cannot be considered as a bond to the brickwork, for the principal constructive element is steel, which, expanding and contracting, makes every change of temperature tend to disrupt the brickwork. The steel structures serve a useful purpose as office buildings, and the writer does not wish to speak disparagingly of them, but rather to emphasize the fact, which all experience affirms, that there is no better obstruction to the passage of fire than a heavy, well-bonded brick wall.

We were once very painfully impressed with the importance of such walls. It was in the year 1857 or '58, at a fire in Lake street, Chicago. A brick store was being burned out. Its east wall projected high above the roof of an adjacent frame building from which people were carrying out the goods.



We said to a gentleman near by, "If that wall stands the fire will go no further, and suggested that braces should be set against it from the roof of the frame building. But very soon the wall toppled over on the roof, carrying it down with the floors of the building and burying a dozen brave men beneath its ruins. If that wall had been one-half brick wider, or better bonded, it might, perhaps, have stood the trial. Why are men so economical of space and material when life is imperiled?

"Ah, me! that land should be so dear,
And human life so cheap!"

The word bond, in relation to brickwork, refers to the laying of brick across the wall, thus bonding two vertical courses together. The end of a brick, excepting on the corners of a wall, is unsightly. The English and the Flemish bonds secure much stronger walls than are generally found in the fronts of the buildings, but the long rows of headers in the one and the checker-board appearance of the other prevent their being much used for fronts. It is generally true in architecture and mechanics that the form, which is most pleasing to the eye, is also the simplest and best adapted in every way to the purpose for which the object was made. This does not appear to be true in brickwork. The vertical courses are very weak without headers to bind them together. The temptation to leave them out is too strong. Beauty and strength do not meet in harmony in a brick wall. Who has not been aston-

ished at the lack of bond in a building that has been burned out, while looking at its shattered walls.

Often a chimney is seen standing erect and sound among the ruins, indicating so plainly that if the walls had been as carefully built they might also be standing. There is no question that division walls should be made heavier, or at least have an occasional buttress, which would greatly increase their stability. Certainly they should be made so that they will stand when all combustible material in the structure has been consumed.

For the form of bond for such walls there is none better than the English bond. For store fronts and dwelling houses, for all walls having an exposed surface, and especially for all hollow walls of brick, we need a bond that does not require the cutting of brick to form the bond, that the wall will appear to be all stretchers, and that will cost no more to put in a bond course than a course all stretchers. The use of band iron for binding the face course to the wall of a hollow wall is not in keeping with the stable character of brickwork. We present to the architects and to the practical judgment of masons and brickmakers a form of bond which we believe meets all requirements.

A split brick is a standard form of fire brick and should also be of common brick. It is the principal form in the bond shown above. Whenever we wish to use a bonding course we use a split brick, as a stretcher on the face of the wall, which covers the ends of the bricks laid across the wall.

Fig. 1 represents a solid one and one-half brick wall. It is faced alike on both sides, with all stretchers. Notice that this is done with a saving of face brick, as each split brick takes the place on the surface of the wall of two face brick used as headers. There is nothing so nice for a courtyard wall or for a brick and one-half wall in any place where even one side is exposed.

Fig. 2 is a brick and one-quarter hollow wall. All stretchers on the face having a hollow space of one-quarter of a brick in width.

Fig. 3 is a one and three-quarter brick hollow wall, all stretchers on the face, and having a space of one-quarter of a brick in width.

It will be seen that heavier walls, varying in width by a half brick, either hollow or solid, or with both, by one-quarter of a brick may be made. Respectfully calling the attention of architects, builders and members of the N. B. M. A. to this form of bond, I close for the present.

GEORGE S. TIFFANY.

Tecumseh, Mich., June 4, 1900.

WRITTEN FOR THE CLAY-WORKER.

NOTES FROM TIDE WATER, VA.

THE SUFFOLK Clay Company has decided to pu. in another drier of 25,000 daily capacity. This will give them a drying capacity of 50,000 per day. They just finished building two kilns of 300,000 capacity each, and will begin work on the third one in a few days.

The Nansemond Clay Company have finished their Bucyrus steam drier and are getting very satisfactory results from it. The manager, L. H. Clark, says the drier is all right and gives them all they asked for. They are burning their first kiln of brick—fifteen arches—now. They are changing the style of their down-draft kilns, also building new clamp kilns.

The firm known as Jakeman, Couch & Jakeman, recently organized to put up a new brick plant in Suffolk, has been dissolved and the plant will not be built.

The market seems to be getting pretty well glutted with brick since the summer yards have all come in with new kilns, and already there has been some cutting in prices.

Mr. W. P. Hussey, vice president of the Standard Dry Kiln Company, called on the brickmakers of this section a few days ago. We enjoyed his visit very much. He carries an abundance of good jokes with him, as well as good sense, and would rather laugh than frown any time.

The Lawrenceville Brick and Tile Company have doubled the capacity of their plant by the addition of new machinery.

J. D. Turner & Co., of Norfolk, Va., expect to put in a new plant of 50,000 capacity on the Elizabeth river, near Norfolk. They have had the clay tested and it makes a very fine front brick, judging from the samples. They are now thinking about making by the soft mud process.

There has been a new industry started in Norfolk, Va., recently. It is known as the Norfolk Plaster Company, and was started by Pennsylvania capitalists. Mr. Newcomer is manager. The Suffolk Clay Company is shipping them a grade of white plaster clay to be used in the manufacture of this article.

H. L. JACOBS.

Suffolk, Va., June 7, 1900.

A BUSY GEORGIA BRICK PLANT.

AS A RULE the brick plants of Georgia are now running up to their full capacity. Throughout the South the demand for brick is sufficient to keep the established plants as busy as bees in harvest. An exceptionally busy and prosperous yard is that of L. L. Stephenson, at Elberton, Ga. In a recent letter Mr. Stephenson tells of his work as follows:

L. L. STEPHENSON, Elberton, Ga.

I began making brick at my present location, which is ten miles from Elberton, on the Southern Railway, in 1894, with a worn out "Sword" machine and a fifteen-horse power engine. Changed machines several times until 1897, when I put in a No. 1 Freese combined pug mill and brick machine, a forty-horse power engine, and a fifty-horse power boiler, and now have in a "Moffatt" steam pump and heater for feeding boiler, and am now turning out 40,000 side cut brick daily. I have sufficient clay to last from ten to twenty years at my present rate of making. I pick the clay and use direct from the bank into the brick machine. Am using the clay five feet deep. It has considerable pipe clay in it with streaks of very fine red sand with some isin-glass, and shrinks considerably in burning. I am using two ten-fan sections of the S. G. Phillips, Rahway, N. J., dryer, which dries 30,000 per day of twenty-four hours. I run my dryer day and night. Brick that are made from 7 to 10 o'clock in the morning are put into the kiln the

same day. What brick I make more than my dryer will accommodate are put on the yard on pallets, using J. C. Steele trucks. I make some oil repressed brick, but not very many, only using a hand power repress. I use wood as fuel at a cost of $1.25 per cord. Usually burn my brick in about ten days, taking about three days to water smoke. My brick are all marketed by rail, mostly in the Piedmont section, the average price being about $5 per thousand. Have been having no trouble lately in selling all the brick I could make, but had considerable trouble up to one year ago, prices being no inducement. The name of my superintendent is H. C. McGinty, who is about forty-five years old, and has been making brick about twenty-five years of this time. Have been engaged in making brick myself only since 1894. You will notice from the photograph accompanying that I work only negroes, which, I should think, would be a curiosity for some of your readers to look at.

Have recently purchased one of the American Clayworking Machinery Company's latest improved automatic side cutting machines, which will be shipped about July 1, and which I hope to have in operation very shortly thereafter.

Mr. L. L. Stephenson and his Employes. Superintendent H. C. McGinty on the Extreme Right.

HOW TO GET RICH.

THIS ALL-ABSORBING problem is answered by The Bookkeeper in the following interesting way:

What the expressive language of the day designates as a "wise guy" used to advertise a recipe for this very thing, charging a dollar, and responding thus by return mail: "Work like the devil and don't spend a cent." Personally, we are working on the problem teeth and toenails, but at this stage of the game we can offer nothing better than theories, and you can get those in carload lots for nothing. The only positively reliable information that we can give up to date is that it is a mighty tough proposition, and that, as in all great undertakings, it behooves a man to do his "behoovenest."

But those who have been over the route have declared themselves on occasions, and there is no copyright on what they said. Russell Sage, who has dealt with millions as familiarly as a soda fountain proprietor does with nickels, and who would regard it as a wanton extravagance to pay more than $16 for a business suit, declares: "Be honest, industrious and economical, and you'll be sure to succeed." As he started as an errand boy, he is a pretty fair indorsement for his prescription. Hetty Green, with her $60,000,000 and backbone of chilled steel, advised women to go into real estate, buy "snaps," and, after improving the property, sell at a nice advance. But she also jerked out the opinion that the most important thing of all for a woman to learn is to mind her own business. It is better thus than if some men had said it. Blind Charles Broadway Rouse, who has offered one of his six millions to have his sight restored, says that "industry, integrity, economy and promptness; learning when to buy, where to buy and how to buy; buying and selling for cash, and quick sales and small profit, will do the business."

Collis Huntington, who has had a repeat or two in his race for fortune, making his first start as a country merchant, puts it thus: "The best way to become rich is not to talk too much during business hours." "Don't let your competitors know what your next move is. Eight hours' sleep every day and twelve hours' work, do a little more than you agree, meet bills as they fall due, put by a one-dollar bill out of every five you earn and invest it in some sound banking, railroad or real estate enterprise," are among the tips dropped by D. O. Mills. Henry Clews's scheme is to buy cheap and sell dear. It sounds easy. And he did it. The former messenger boy is a multimillionaire.

Andrew Carnegie: "Five things are necessary. They are push, squareness, clear-headedness, economy and rigid adherence to the rule of not overworking. But the final question will be, What has he done for his fellows?" As he comes out of the scrimmage with a surplus of a quarter of a billion, he is now worrying his declining years with the vexed problem of doing for his fellows.

Profoundly Pat.

A learned man is a tank; a wise man is a spring.—W. R. Alger.

He who is ashamed of asking is ashamed of learning.—Arnim.

Labor aimed to kill Capital. "Do not commit suicide," counseled Sense.—Scott O'Connor.

Advice is seldom welcome; and those who want it the most always like it the best.—Lord Chesterfield.

WRITTEN FOR THE CLAY-WORKER.

NEW YORK'S USE OF BRICK.

NEW YORK USES BRICK in three different methods of construction, or for three different purposes. The most commonly seen and probably the best appreciated is the use made of them in building. There isn't a building in the city in these days which hasn't brick or some product of clay in its construction somewhere. It is used either in the foundation, the outer shell, or the floors are tile, which is but a form of brick. Some of the largest and finest buildings in the city are largely of brick, though a few have stone fronts, while all the rest are brick. All the side walls, where they touch adjoining buildings, are brick, the ordinary rough variety, just from the kiln. Frequently they come from yards using only the old style methods of manufacture, a fact which indicates how much more readily brick clay can be adapted to the requirements of any position than can stone.

The second use for brick, which introduces it to a large proportion of the people, is in paving. Some of New York's streets are paved with vitrified brick, some are paved with ordinary brick, extra hard, and some are paved with the soft sort. The latter are used only where there is little traffic; but this fact illustrates again the great advantage of utilizing the manufactures of clay. Stone is the same wherever it is put, but brick can be varied to suit the requirements of the case, even in paving. It is fast becoming common judgment that brick is the most permanent and hence the cheapest paving material known.

The third distinctive use in New York is in the underground construction of sewers and conduits. It is probably no exaggeration to assert that New York is virtually founded on brick. Every street through which a sewer is laid is bricked for its full width, and there are a large number of conduits for wires and pipes, all of which are brick. In such cases as this it is convenient to handle, lends itself readily to constructive requirements, and is cheap. The new subway, the greatest engineering work of modern times, will be constructed largely of brick and the quantity needed for its construction is almost beyond comprehension.

In a former article I alluded to the ancient brickmakers and the practical indestructibility of their work. There are specimens of the ancient burnt clay in different museums, which are almost as old as man; yet they are apparently as sound as when they were first made. It is particularly useful because climatic influences upon it are slight. American granite crumbles and distintegrates in the dry air of Egypt. It needs the moisture of America or England to keep it solid. The Egyptian granite, of which Cleopatra's Needle was made, crumbles in the damp air of New York, and already the markings are becoming obliterated solely by the action of the elements. Brick are utterly indifferent to either dampness or dryness. It is indestructible in either cold or hot climates.

Capitalists who construct large and high buildings of stone and declare them fireproof may be right technically. They will withstand heat, perhaps, though in a city like New York or Chicago, it would be possible to get heat so intense that buildings built of stone would fuse and the stone itself become a molten mass. But there is danger before the heat reaches such an extreme point. A moderately hot stone wall will crack and fall when water is thrown over it, where brick would stand without a flaw. The clay has been hardened in the fire. It is sufficiently porous to absorb the water without injury and without danger. For this reason it is safer to build of brick, even in the well protected districts, where serious fires are practically unknown.

An example is the sky scraper fire a year ago last December in which the marble front of the Connecticut Life Insurance building was ruined through a comparatively small fire next door and inside the building itself. The stone cracked and either fell or had to be removed. The huge steel girders, imbedded in brick, were pronounced uninjured, and the upper stories were reconstructed upon them. Had the front been of brick it would have escaped with a blackening and would have required a new dressing instead of an entire new front from the eighth story up.

Birdseye View of L. L. Stephenson's Brick Works.

All the new apartment houses in New York are being built of brick. In a ride along Central Park west and up Eighth avenue a few days ago I counted at least a dozen large buildings in process of construction, all of brick, and only two along the same distance of stone. The street walls are being made of vitrified brick, colored to suit the taste of the architect, and frequently a favorite variety of stone is imitated at much less cost, and no one but an expert would be able to tell the

difference. The effect is often highly artistic, yet it must be admitted that only occasionally is an architect found who is an artist in the use of brick. The tendency has been to erect large buildings of stone, or, at least, construct the street walls of stone, and only within recent years, comparatively speaking, has brick been used to any extent. In all the older buildings the outer walls are stone, but they were erected before the artistic manufacture of brick had been carried ahead as rapidly as it has been during the past ten years.

It will be noted that the ornaments with which many of the more elaborate buildings are adorned are of clay—it might be called brick, since the preparation is essentially the same. Clay being plastic it can be pressed into any desired shape and the ornaments have more grace, when airiness is desired, and quite as much solidity when strength is required, as the stone varieties, which cost more and are no better.

The impression one gets about New York is that architects and builders are beginning to understand this and are using brick or molded clay (terra cotta) wherever owners will permit; and in commercial buildings it is no hardship to secure their consent when the expense is shown to be less. Ease of manipulation means ease in constructive work and that in turn reduced expense. The curious thing is that it has taken all these years to learn such important facts, when it would appear that they must be patent to the most cursory observer. On the other hand it must be remembered that the average stone man has pushed his wares more assiduously than the brick or clay man, and the result has been that stone has been specified many times when brick would have done far better, only the strenuous efforts of the producer of stone being responsible for the selection of granite or marble.

A few successful buildings are the most valuable advertising and there are scores of successful brick buildings in New York alone, while in all the cities of the country the number is beyond computation. And the number will increase. Brick work is only in its infancy. It is only beginning to be understood. Within ten years more brick will be the great constructive material, even when monumental structures are under consideration. Its artistic qualities are endless when in the hands of a master; but it requires one generation of workers to produce the artists necessary to bring out all the possibilities of a given material. The first generation of brick builders is passing. The next will use clay wherever it is possible and will mold it into such artistic forms that the old stone buildings will look stiff and Puritanic beside the new structures.

BURTON

THE VOICE OF EXPERIENCE.

If You Have Anything You Don't Want, try a Card in our "Wanted, For Sale," Etc., Column.

NEW YORK, 33 NASSAU ST — PHILADELPHIA, 1935 MARKET ST — CHICAGO, 54 LAKE ST

Welsbach Street Lighting Company

of America.

CLEVELAND, 809 THE CUYAHOGA

CLEVELAND, O. May. 21, 1900.

T. A. Randall & Co.,

Publishers Clay-Worker, Indianapolis, Ind.

Gentlemen:--

Herewith find check for $65.60, balance due you for my For Sale ad, as per your statement of recent date. Please discontinue the advertisement. It did the work effectively, I have sold both the four-mold Dry Presses.

I consider the Clay-Worker the best advertising medium in the United States for goods handled by brick manufacturers.

Yours Truly,

F. B. Maury

Written for THE CLAY-WORKER.

IN A ST. LOUIS SEWER-PIPE FACTORY.

—How Large Pipe Is Made and Handled.—

THE FIRST THING that attracted my attention on seeking the clayworkers here was that they keep wide open shop—which is the true American spirit—and the next thing I noticed was that the shops were of the strictly up-to-date kind. Another thing that I soon found was that the interests were too extensive to cover in any kind of a way in a single article, and for that reason, for this time I confine myself to the things of more than passing interest in one plant—The Blackmer & Post Pipe Works—where I spent a pleasant while with the courteous and obliging superintendent, Mr. Weston.

In their clay field prospecting they have found that, while boring is a good thing in a preliminary way, the best satisfaction of underground conditions is to be had from "mortising down" making a hole about four feet square, which permits a close study of the layers of clay and their exact conditions. They find the boring good, too, for tracing around the "mortised" hole for indications of lay and extent.

Their kilns are all of one class, round down draft, and the only visible difference that is shown in an outside view is in the sizes. Those at factory number one have six fire holes, while at factory number two eight is the rule, and the capacity of the kilns is about twice that of the smaller ones. One new kiln was being started, which is to measure thirty-one feet inside. I took a somewhat lively interest in these kilns, and the amount of heat used, for I have been lately troubling my think box with the question of measurements in high temperatures. Down among the sawmills we hang a thermometer inside a dry kiln, with a glass between it and our view, so that we can find out at just what temperature we get the best results, and then, with the thermometer for our guide, maintain just the desired temperature. We can't do that in clay kilns though.

One day recently I visited a factory where red granite rock was being melted and converted into "Rock Wool," and was told that it took a temperature of 3,500 degrees for this work. The cupola lining for this work was made of eighteen inches of fire brick, and sixteen hours run was the life of a lining. This, of course, made the work extra expensive, from having to reline with eighteen inches of fire brick every sixteen hours, and no other lining for this purpose has yet been found that would last even as long as the brick, but of that we will talk another time, and I mention it here for it started me to wondering just how this temperature was being determined. When, then, I saw these brick kilns, I thought here is where I'll get a line on the measuring of these high temperatures, and I asked the superintendent about the amount of heat and how he measured the temperature. He said the temperature during the hot stages run to about 2,500 F., and explained to me some interesting experiments with testing cones.

The cones were numbered and marked with the fusing temperature, and a careful record kept of them showed that they were tolerably accurate in that point, which bespeaks great care and exact knowledge in the maker of them. It was found in practice, though, that such things might happen as uneven spots of heat in the kiln, and the cone fail to be in a place of average heat. Then the practical would have to come to the aid of the scientific, for if a try piece of clay showed that the thing was about as hot as was safe and the cone not yet fused, or if the cone fused while the try piece did not show sufficient burning, then the balance must show for the judgment of practical experience, and science give way to the

instinct of the trained eye. But—well, we will talk about this high temperature business another time.

In factory number two—the new factory—they make a specialty of big pipes, their large size being three feet inside. And that they knew thoroughly just what they wanted to do, and had carefully figured out beforehand just what it would take to do the work, is attested by the fact that the original plans of the plant were carried out to the letter, and gave satisfaction in every detail, without any of the worry and expense incident to changing and cutting and trying here and there. Another thing that I want to mention here that is worth noting, not only by clayworkers, but by all lines using skilled help, was the apparent ease and great skill of the operators. I had been admiring the manipulations of the pipe machines, and wondering how the work could be done with such accuracy without any visible effort at gauging in the cut-off, and on inquiry was told that one of the operators had been with them for about twenty years. It is indeed a matter of much credit, not only to the man himself, but to the company too, when a man holds a position like that for so many years. Even considering the years of service, though, it it still rather astonishing to me the way the run of the pipe could be stopped continually with such accuracy, for the joints looked as if they had been carefully cut by measurement, while, in fact, the measuring was only in the eye of the operator.

In the making of this big piping every detail was full of interest, for it was of such dimensions that it could not be handled by hand at any part of the process, but must all be done with special machines and appliances. To begin with, the press was a big thing; the steam cylinder was forty-eight inches in diameter, and the clay cylinder twenty-six. The usual proportions are to have the clay cylinder just half the diameter, but in this they hade it two inches larger, figuring that they would have plenty of pressure any way, and they surely have. Just figure on that pressure once, assuming a hundred pounds of steam, and remembering that you have a cylinder forty-eight inches in diameter coming down on one that is only twenty-six. The two pistons were connected with a five-inch hollow rod, and down through this came the driving rig of the power cut-off. It had a right and left friction drive and the cutting knife was eccentrically arranged to the center driving shaft so that it would extend out and cut the pipe when driven to the right, and then draw back out of the way when reversed.

When cut off the pipe rests on a board, which is lowered slightly to the carriage. This carriage, too, is power driven, and when it comes out clear of the press it is halted and a drum lowered into the pipe that just fits the inside; then it runs on out to a big turner which up-ends it onto the floor. The boards for the ends and the drum are handled by apparatus specially designed by themselves to make the work as near continuous and as light in labor as possible. This idea is followed out again in the trucks for handling the joints after they are made. When we consider that the heaviest pieces weigh something like fourteen hundred and fifty pounds and are only raw clay it is a matter of some wonder that they can be handled at all without smashing, but it is simple once we see how they do it. The board under the joint has cleats on the bottom that holds it clear of the floor, and a truck is used having a sort of scoop bill of angle iron, which just slides under the ends of the board. Then there is a special lever attachment that raises and lowers the loaded portion of one truck, by which one of those big pieces can be lifted from the floor with only a pressure of from fifteen to twenty-five pounds exerted by the hand of the operator. So complete and easily operated is the truck that those big pieces of pipe are handled as gently as if they were small pieces that you could take up lightly in your hand.

It takes about twelve days to air dry this heavy piping, and then about ten more to burn it in the kiln, i. e., it takes about ten days to burn a kiln of it and cool it off ready to take out, making what is termed a ten day turn.

TAYLOR.

Written for THE CLAY-WORKER.

FROM THE MONONGAHELA TO THE JAMES.

IT WAS IN the early spring of eighty-two. Three taps of the big bell on the old packet, Elizabeth, rang out on the crisp morning air, and, as the bow of the Iron City steamer swung in towards the rocky shore of Jackie's Landing, the old brickmaker put his handkerchief back into his pocket, wiped his chin with the back of his hand, and, while displaying a kind of lonesome-like smile, began to gather up his baggage.

The brickmaker and his two sons had for many years turned out their four thousand in the little weather-beaten yard on the banks of the Monongahela. The winters seemed to be getting colder and longer each year to the old molder, and throughout the bleak Siberian season that was just kicking the snow off its heels he had been busy carting driftwood to keep the fire burning under his wife's teakettle, cleaning up the old spades, molds, bows, etc., and trying to reckon the probable demand for brick in the home market the coming season.

It was the middle of March—ah! well I remember that day! (You see, I was one of the boys above mentioned.) My father had two cows that seemed to have the spirit of several amateur brickmakers I know. They would start off pretending to go to the brook for a drink, and then make a bee-line for the nearest gap in the fence.

My father always kind of pitied the amateur in the next yard, who said he was an expert in the trade and talked for hours about things he knew nothing about. He kind of pitied him, because he reminded him of one of those tricky brindle cows—not because he had freckles on his face and a limp in his off leg, but for his coming over so frequently, pretending to ascertain the time or to quench his thirst, and then purposely losing his cane, that he might walk three times around the kiln to see how father turned his arch and set the first courses.

As I started to say, it was the middle of March, and Jim and I were driving the cows hither and thither through the frozen and partially snow-covered cornfield, trying to make them eat up the old cornstalks and stray sprigs of sassafras, that the plowman might keep a slack rein and a mellow temper when he turned the furrow for the new corn. The snow still covered the hills and the skate track was visible on the margin of the pond; the roads were hub deep with mud and slush, and, all in all, things were disagreeable for the rheumatic and the cowboys. We sat on the top rail of the fence with our hands in our pockets and our teeth chattering, when Jim looked up and said, "There comes dad!" and then we slid down from the fence like eels and began to busy ourselves with the cows. He came straight for us, and we began to wonder whether he had seen us smoking cornsilk or was going to thrash us for something we had done the year before, when, behold! we saw a broad smile on his face and he delivered this command:

"Drive the cows to the barn. Here is a letter from Morris, and in ten days we are to be in Virginia—bag and baggage!"

There was great rejoicing around the old Pennsylvania farmhouse for a few days, and soon the auction sale bills were flapping in the breeze, advertising the sale of everything from a Berkshire bore to a gimlet.

This brings me back to the old steamer, Elizabeth. The gang plank was hauled in and we hied us aft to get a last look at "Old Jackies." The "forward" bells rang in the engine room, the massive wheels were set in motion, and ere long we were out of sight of the old homestead, and before many hours were on the "Royal Blue" for the sunny South.

It was the 4th day of April when we found ourselves winding a serpentine course down the River James—the pride of Virginia—on the Ariel, a mammoth steamer that seemed as old as the very hills that echoed the voice of the paddle

wheels. It was a delightful trip down this historic stream, crossing and recrossing, to touch at each antiquated wharf, perhaps to deposit only a lean mail pouch and a bag of guano, or take on a few sacks of peanuts or barrels of shad. The scenery was beautiful, and grew more interesting with every mile, until at a point that seemed the acme of the whole southern shore we found ourselves at the end of our journey. Here, on an old plantation of 13,000 acres, a thrifty land agent was laying the foundation for a Yankee colony.

The brickmaker took up his "claim"—twenty acres of woods and a bank of clay. Soon the sound of the ax was ringing through the forest and a patch of coppice was melting away into a sandy floor and a kiln seat. Our few neighbors rejoiced to see a new light in the night. It came from the humble cottage of the brickmaker, that sprung up like a mushroom, with the smell of new pine and whitewash.

I shall never forget those days in the great pine forest up the James. The corn furrows, plowed by the slaves years and years before, were distinctly visible, carpeted with pine needles and canopied by lofty boughs. Often after the day's work of brick had been spread out on the white floor and the sun had reclined into the lap of the dark trees, we boys, armed with an old musket and a mammoth army revolver, would steal off into the depths of the wood to surprise the wild turkey as he sought a thick bough for a night's rest, or to get a crack at one of the numerous foxes that began their squeaky barks as the black trunks of the old pines were blended into the gloaming.

We were hustlers in those days. There was the Yankee push and the novelty of a strange and glorious climate combined. We ate four meals a day and worked with a vim. Early and late, through dust and perspiration, with a deal of song, commingling with the "Yo-ho" of Africa and the squeak of the "crab"—pug mill. There were many drawbacks, notwithstanding. Our custard had to be spiced with quinine, our hilarity occasionally shaken by a fit of dumb ague or a fashionable chill, and the level floor, so prettily laid with smooth, velvet-like bricks on a Monday, would occasionally be found a dancing rivulet on Tuesday morning, for in the Old Dominion it rains as it rained when Noah embarked for Ararat. Then we had such tender bricks! They were like chocolate drops that melt in your mouth. And oh! how father used to stroke his chin and look with a faraway look when he stood at the edge of the floor in the morning and saw the expanse of "bricks without straw," modeled like the chancel window of a great church or the bottom of a dried-up creek.

There's many a crack
'Twixt the mold and the hack.

At last the first kiln was completed. The old thing of a summer's making was pasted up like our mother used to fix up apple pies, even to the holes in the top to leave out the steam. Two great ranks of cordwood overshadowed the kiln, and an old ex-slave exclaimed, as he crept by with a stump-tailed heifer in a home-made cart, "Law's sakes, boss! Is yo' gwine t' use all dat ar wood t' bake dem bricks?"

Soon the white smoke was lifting over the pines, the crack of the wood was heard in the arch, and for many days the white and blue and black smoke by day and the glare of the arch by night were a beacon and a curiosity to the yeomen of that thinly settled country.

Finally the man who knew everything came around and said when he was a boy he "lived along the North river," and, continuing, "from what I know about brickmaking you have burned enough wood to melt every brick in that kiln;" and then gave us to understand, from his store of knowledge, that if the kiln wasn't shut up at once and cooled off quickly there wouldn't be anything left but lava.

Father told him, though (with another stroke of his chin), that it wasn't advisable to turn the hose on it. Nevertheless, the boss thought himself that it must be ready to close, as it had settled admirably; so the final fire was ordered, the arches closed, the platting tightened, things cleaned up around the sheds, and then all the boys went fishing.

One afternoon, a few days later, my father and his brother and a few invited cronies went up to sample the kiln. A few hot bricks were fished out with a spade. The hole was made deeper. Down nearly to the middle the choicest ones were taken out and laid in a row on the grass. Father wiped his chin again with the back of his hand, and then tried to stroke the whiskers he used to have, and, with that far-away look, he looked even unto Pennsylvania and said, "I'll swang!" And you ought to have seen the fellow from the North river, who was sure to be on hand to say, "I told you so." He never said a word, and I knew from his looks that he was wishing right then that he was drifting by the palisades in a canal boat. Such *pretty* bricks! Such delicately tinted bricks you never saw! Pale pink in the center, blending into a delicate yellow along the edges—just lovely bricks! Real winter sunsets! The girls all admired the bricks, especially the ones with their names on, and the boys liked the ones marked with coon tracks, deer tracks, fox tracks, dog tracks, and the prints of fingers and toes and canes of curious passers-by who wished to display a friendly interest, and each, in his own way, satisfy his curiosity as to whether the bricks were wet or dry.

Father had burned many a kiln of brick with coal, and, had he backed his thoughts with action, would have been the first man to use natural gas, but this was his first experience with pine wood. He was as much down in the mouth as the kiln was down in the center. He disposed of a number of the artistic product to backwoodsmen, who promised to keep them out of the rain and put peanut sacks over them in the frosty season, and some he gave to the neighbors as keepsakes, who still keep them to hold the doors open in the summertime and warm the children's feet in the winter; but a great many remained where they burned, and to-day, if you go up that way, you will see a pink spot in the midst of a green wood, and if you are not careful some of the old darkies will make you believe it is where Captain Kidd's black bull gored a regiment of Yanks who walked over the sacred garlic above his pot of gold.

No Sense in Forgetfulness.

The other night after office hours the manager wrote an important business letter, and, as he put it in his pocket, he turned to me and said: "Now, don't let me forget to mail this when I go out."

"No," said I, "and don't you forget to remind me to not forget—but why tax either of us? Put the letter in your hat; you'll not forget your hat."

There's no hope for an absent-minded man, and there's no excuse for one who forgets. There's a distinction with a difference. The absent-minded man might leave the office without his hat; he might start north when his intention was to go south; at times he doesn't know his own name. He can't be helped; but the forgetful man can systematize matters so that there will be no chance to forget. First, he must depend upon his own memory—place entire confidence in his own ability to remember. The only reason that some people forget is because they depend upon somebody else. Take this mental prop away and they would soon cultivate a memory. I don't have much sympathy for the forgetful man who doesn't try to remember. —Ad Sense.

Do One Thing Well.

In speaking of many business men having too many irons in the fire Frank Sibley prophesies that the day of panics is not over. Panics will come again. In the days of prosperity avoid outside speculation. Concentrate your capital in the business in which you are engaged. Put yourself in a position where you can go to bed at night owing no man a dollar. Then panics, long periods of depression and financial stringency for you will have no terrors.

A great many men seem to take considerable pride in being connected with a variety of enterprises. Once in a while those side enterprises pay. Twice in a while they lose. Those men die as do all others, but their estates are harder to settle. The other fellows engaged with him in the side enterprises "scoop" the estate. Stick to your own business and wipe them out.—Exchange.

WRITTEN FOR THE CLAY-WORKER.

THE NEW YORK BRICK MARKET.

WEATHER CONDITIONS make the profit or loss side of the ledger favorable or unfavorable, as clear, dry weather is very essential to the open yard and tends to swell the income of the proprietor. The loss of labor in cleaning up after a rain amounts to quite a sum, as battens have to be removed from hacks and yard cut down to remove the waste from the green brick that were left on the yard, with a certain proportion of washed brick that is the result of each rain. Taken the season through, this loss cuts a figure.

So far this season the weather has not been of A1 grade, not much rain, but overcast skies, so much so that the brick would not dry, with the winds generally from the east—none of the good, cracking northwesters that you hear the old brickmakers tell about and which dried the brick as fast as they were dumped on the yard.

Brickmakers, like farmers, have "troubles of their own." In the case of the latter, the cold weather retards the growth of the garden truck so that the market is a low one. The brickmaker keeps on making brick and the stock under the shed keeps on accumulating, as the shipments meet with so slow a sale that the green brick under the shed makes a good showing so early in the season.

—A Fair Profit.—

In the report of the Convention in the February Clay-Worker, the first paper read before the Convention was on "Progress and Prosperity." In the paper these words were used, "But I wish to warn you against too great a profit." The first gentleman to discuss that paper said: "We should be satisfied with a fair profit." The next gentleman said: "There is a good demand for brick and we are getting good prices, which are not high, by any means." The third gentleman hit the nail on the head when he said: "There is no danger of getting our prices too high." The fourth response sustained the three. The member from Buffalo was like the man who sawed wood—he thought a great deal, and in his few remarks plainly showed that the danger line of too much profit was not likely to be encroached upon. Brothers Purington, Tiffany and Plumb no doubt felt at the time they spoke that the danger of too much profit need not cause the conscientious brickmaker to lose much sleep.

The last speaker placed that bete noir of the brickmaker right in the middle of the road of the fair profit in the manufacture of brick, especially common brick, that very large IF. He said: "If steel don't enter too much into the construction of buildings, we will have good times."

Now, Mr. Editor, what is a fair profit? Do you think if that question had been discusssed or voted upon, a unanimous vote could have been reached? I think not. Would any member be satisfied with 25 cents per 1000 clean profit? The answering "No" would have sounded all over Detroit. Would double that amount fill the bill of sufficient profit? There would no doubt have been a divided vote on that figure, as the conditions and environments of the many yards would have called forth mixed views. The manufacturer that turned out 50,000,000 or 60,000,000 might have said: "Well, it is better than nothing," while the smaller manufacturer turning out 1,000,000 or 2,000,000 would think the return small. I think it a safe venture to say there would not even have been an agreement on the question: "Would $1 per 1000 be a fair profit?"

Gentlemen of the brickmaking fraternity, I think our experience is somewhat like that of a Methodist congregation I have heard of. There had been a long, dry season, and the church members wanted the minister to pray for rain, and when the rain did not come, they were so displeased that the minister resigned. In due time another minister applied for the place and was accepted. Another dry spell came, and again the church members desired their minister to pray for rain. He called the congregation together and asked them to set a time when they should have the rain. As one man named one day, some member had grain to cut; another day was named, and some member wanted to shingle his house, and did not want the rain that day, and then the ladies took a hand, and when a certain day was named announced they did not want the rain that day as they were to have a picnic. The result was they could not agree, so the minister said: "Brothers and sisters, had we better not leave it to the Lord." They concluded that was best, and the rain came down that night and all were satisfied.

In the case of profit and loss per thousand, I would say: "Get all that is possible." As one member put it, you are between two millstones, and when it comes your way let fair profit take a back seat and get all the profit you can, as the low scale is always within sight anyway.

—Progress and Prosperity.—

I agree with Mr. Purington, the two go together, and no line shows it more than the brick business. The members of the convention all seemed sure—no not all, for I am certain there were some there who were not so sanguine as were some of their fellow brickmakers—that prosperity was here to stay.

I wish the editor had caused to be placed in the homes of each member the figures on page 177 of the convention number of The Clay-Worker, showing the falling off in building in the city of Philadelphia, in 1898 and 1899—a falling off of over six thousand buildings in one year, and a decrease in cost of nearly sixteen millions of dollars.

It is not quite three months since the Convention met, but what a change throughout the States has taken place. The last report of Dun and Bradstreet is far from satisfactory. As a result the brick industry is in for its share of a waning prosperity. The closing of iron mills and mills of other kinds with the fall of prices of their product will without a doubt soon be up to the brick trade throughout the country.

—The Brick Trade—

Seems to be the football that can be most easily kicked. Of course there is no one given point where the manufacturers can regulate prices for all, and never will be unless all yards are under the control of one organization, as is the case at Haverstraw; then they can say, "If you do not hold up the market we will make the rate so low that it will mean loss to you." So long as the present condition exists of individual ownership, so long will the present dog-eat-dog policy exist.

—Setting Brick.—

In the kiln, and the results of same. It seems to me that a matter of that sort would have had a good first-class discussion before the Convention, as beyond doubt the way the brick turn out depends on the way they are set in the kiln. Of course, the size of the brick has a good deal to do with it. If the proportions are not right they will not set right, being either too loose or too tight, and the fire will either run through or will not work fast enough, as the case may be.

If some of the men that burn brick in other parts of the country would come to Haverstraw and see how they set the brick, they would be surprised. The kilns are set fifty wide and sixty-four high, and the result is as good in percentage of good brick as can be found in the more elaborate kilns.

St. Louis, Chicago, Philadelphia and New York all show a surprising falling off in the building prospects for the season. Last month I showed the falling off in building permits. Now, a month later, we will balance up, and see where we stand.

From January 1, 1899, to May 14, 1899, 2,176 building permits were issued. This season, in the same length of time, only 751 have been granted, 1,425 less than the previous year. The estimated cost of the present year's projected buildings, and those of last year, is $27,135,607—over three millions more

than half in favor of 1899. I leave it to you if that is not enough to "make a grindstone weep."

—Shipments of Brick—

Continue free, and, if possible, will be continued during the month of June, as the Fourth of July will soon be here, and a general settling up is in order if there is money enough to enable the manufacturers to do so.

Labor is not as plenty as has been the case some seasons. Many of the old "rounders" have not showed up, and possibly never will, as death has claimed them during the winter. The boats that carry the brick to market make the trips so slow that it helps the shortage of men, as the quick trip keeps the men busy.

Burning coal is fairly under way this season, there being but two yards using wood altogether, and the kilns that have been burned with coal have turned out good. It is safe to say that coal is the coming fuel, both on account of the light labor and decreased cost. As a rule, when you find a man who sticks to the old way in one thing, he is behind in all.

—The Brick Market.—

Surely, if anytihng would call a halt, it is the way the prices fall off:

Haverstraw.....	$4.00@4.50—special,	$5.00
Newburg Bay...	4.00@4.50—special,	5.00
Up Rivers.....	4.00@4.50.	
Hackensack.....	4.00@4.25.	

The comparison of figures with last reports show a falling off. A. N. OLDTIMER.

Hackensack, N. J., June 5, 1900.

Written for THE CLAY-WORKER.

CROWNS OF KILNS.

By D. W. Stookey.

ROWNS OF KILNS have been discussed recently by different writers. In some instances theories have been spun pretty well, and as is nearly always found in such matters, there must be a compromise between theory and practice. In other words, in practical work it becomes necessary to adapt scientific and mathematical teachings to practical possibilities.

As an illustration, it might be mentioned that brick of special shapes have been recommended for use in the construction of crowns for round kilns, but a careful study of the context will show that those writers who have suggested the desirability of special forms of brick concede that in practice it is almost impossible, or at least not practical, to make and use the special forms that mathematical accuracy calls for, and the conclusion drawn is that they have about become reconciled to use brick of common shape, as are made everywhere and for other purposes.

In this paper it is intended to take up the various phases of crown building for round kilns and adapt them to practical work. It is not intended to introduce ideas that cannot be put to practical use.

—Form of the Crown.—

All who have expressed opinions as to the best form for the crown, so far as the writer's observation shows, have advocated a segment of a sphere. Doubtless this is correct. This form is the strongest figure known and not only presents the arch to sustain the weight, but gives the same curvature and conditions at every point in the same horizontal circle or parallel, as the geographers would call it.

There is a difference of opinon, and probably always will be, as to just what sized sphere should be called upon to give a part of itself to the kiln wanting a crown. Some advocating high and some low crowns. Evidently either a high or a low crown could be built upon any kiln, and it would still be a spherical segment.

If the diameter of the sphere was the same as the diameter of the kiln the crown would be a hemisphere and would be just half as high above the top of the kiln as it is wide. If the crown is less than a hemisphere it will be lower, the diameter of the sphere of which it is a segment will be greater than the diameter of the kiln and its center will be somewhere below the level of the top of the kiln wall. That is, it will be a part of a larger sphere.

Low crowns are more in favor than high ones and, we think, justly. They require less brick to build, are cheaper, lighter, present less surface from which to lose heat, and are less liable than high crowns to lose their form and fall. They are, as stated before, segments of larger spheres and are flatter and less liable to kick or bulge out and fall.

—Why Crowns Fall.—

When a kiln is heated the inner side of the crown becomes heated much more than the upper or outer part. It consequently expands more and must have room. Its arched form causes it to lift and, since the upper side of the crown is not heated as much, it does not expand as much. Consequently, it must crack. Any observing burner has noticed these cracks upon the top of a hot crown. More or less dirt falls into these cracks, and when the crown cools and settles this dirt wedges the cracks open and prevents the crown from returning to its original shape. Each burning adds a little to this wedging and changing of form until the places where the cracks open most are bulged up, and some other places have settled a corresponding amount. All parts of the crown are not heated equally and, therefore, do not expand equally. Those places that receive the most heat expand most and tend to open most.

In ordinary round down draft kilns the heat is delivered around the outside near the wall. Naturally one would expect the greatest expansion there, and first thought would lead us to look for the most bulging near the skewback, but the stiff walls and rigid kiln bands and skewback firmly hold the lower part of the crown in place.

In practice I have found that the most bulging is about one-third of the way from the skewback to the top of the crown. These places gradually rise higher and others nearer the center of the crown sink lower until equilibrium is destroyed and the bulging places kick out and the top drops in. This is no theory nor fancy sketch, but a story of actual experience.

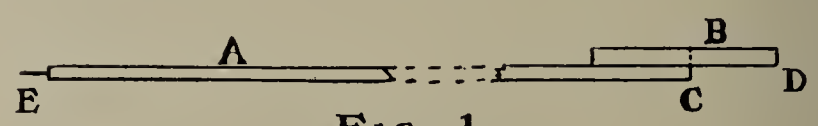


FIG. 1

—Crown Building.—

Having decided that a spherical segment is the best form for a round kiln crown, and desiring to build that form, it becomes necessary to have a guide that will aid in laying each brick in the exact place. This can best be done by a simple trammel made of a straight pole or strip with a stick about a foot long nailed to the top of it. See Fig. 1.

This device is not only very simple, but exceedingly accurate. A short piece of iron is driven into the lower end for a pivot. From C to D is the length of a brick, say 8 inches. Now, we want to find the length of the pole from C to E. Draw a line, F-G (Fig. 2), half as long as the inside diameter of the kiln. If the kiln is 20 feet inside, draw a line 10 feet long. At one end, as G, draw a line, H-I, perpendicular to F-G. Now decide how high the crown is to rise, say 4 feet, and lay of this distance from G to H. Now, draw the line, H-F, and find the middle, K. Draw a line through K perpendicular to the line, H-F, until it intersects the line, H-I. The distance of I-H or I-F will be the length of the pole, C-E (Fig. 1), which

is the radius of the sphere of which the kiln crown is a segment.

Take a block with a small hole in the top to stand the point, E, in and fasten it in the center of the kiln, just high enough so that the point, C, will touch the inside edge of the kiln wall. The trammel will now give the angle for the skewback. The scaffold can be built around the inside of the kiln and will not interfere with this trammel. It is convenient to have strong plank to stand on and these can be moved toward the center of the kiln as the work of building the crown advances toward the center.

Much unnecessary expense is incurred by the advice of "experts" and "professionals" who delight in specifying and using the finest material obtainable. While it is important that the skewback be built level and to the line, it is not necessary that specially formed blocks be purchased for the purpose. Brick can be chipped and filled with mud or mortar that will hold well. No one ever heard of a crown falling because of the skewback.

Be careful to have the wall level all around and the circle as perfect as possible before building the skewback, and

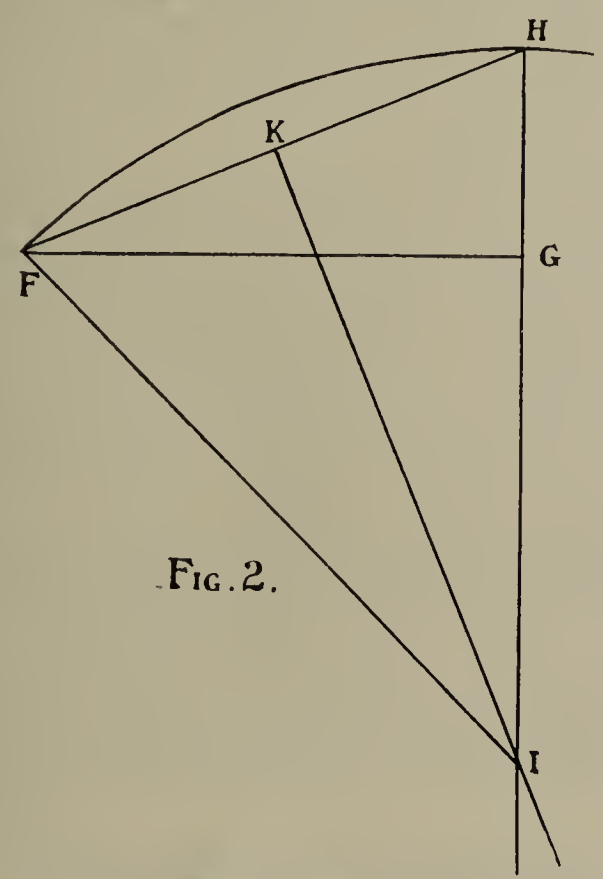


Fig. 2.

then use the same material that was used in building the wall, and your skewback, if properly banded, will never fail.

—Laying the Brick.—

Have the mud as thin as it can be handled with a trowel and free from lumps. Spread a little on the skewback, then take a brick and lay it flat in the mud. Place the trammel on the brick so that the lower end of the brick will rest against the end, C, of the pole. Tip the brick until it touches the strip, B, at both ends, and is parallel with the sides of the strip. Now rub the brick endwise back and forth until all the mud that can be has been squeezed from under it, keeping it in touch with the trammel and it is done.

After the first course is laid the trammel need only be used occasionally and a careful man can run two courses at once, if the brick are dry, so that they will not slip. Two or three men can work at once, using the one trammel. No skill is required to lay a crown with this trammel to guide, but any quick, careful man can soon learn to do it well. It is important that the mud be rubbed out until the brick touches the ones under and beside it. This only leaves enough mud to fill the irregularities between the brick.

When accurately laid by this trammel as a guide the central line of the top face of each brick points to the center of the sphere, and the crown is practically mathematically correct. The idea of making brick of special form for crowns is very fine in theory, but in practice cannot be worked out, and in the use of common brick the end is so small that the error is too small to be worth considering.

—Double Course Crowns.—

The man who builds a thick wall to retain heat and then crowns his kiln with a single course of brick, set endwise, is as much to be pitied as the oft derided fellow who carried his grist in one end of the sack, with a stove in the other end, to balance.

The crown is the hottest part of the kiln and must prevent the heat from rising. As the heat increases and the crown expands (and the cracks open most when the kiln is hottest), it is very desirable to have some additional covering to hold the heat down in the kiln. The hot crown, the heat over a hot kiln, and the steam arising from it during a rain all show the great amount of heat that is escaping.

Of course, double crowns are heavier and require additional strength in the kiln bands, but one dollar expended here will save many in fuel.

A sixteen-inch crown would be none too thick to retain the heat. If that seems too expensive a four-inch top course should be laid and plastered over with lime mortar to prevent washing by rains and wasting by winds.

This admonition may seem to some to be carried too far, but only a month ago I heard a brickmaker say that he kept a canvas cover for his kiln crowns because the rain came through and spoiled the brick while he was setting kiln. The amount of heat that he lost through such a crown as this would be simply appalling to him could he know just how much he lost.

—A High Crown.—

The statement has been made that, "The only advantage in making a high rise is the fact that it does not require so much masonry and ironwork to withstand the thrust of the arch." The higher the crown rises the more brick it contains and the heavier it is. It is not a truss or a self-supporting arch, but depends directly upon the kiln walls and bands for its support. If it is true that there is less thrust upon the bands in a high than in a low crown, it is probably true there is more thrust and tendency of the crown to kick out a few feet above the kiln walls. Is it not true that arches of the same span, having the same weight to support, exert equal lateral thrusts, whether they be high or low?

In another place the "unoccupied area in the crown" was mentioned as an objection to high crowns. I have no unoccupied space in my kiln crowns excepting over and around the bag walls. The space in the crown is an excellent place to burn brick and tile and I always put all in there that I can. If the kiln is properly set and the bag walls low enough to allow the draft and heat to pass readily into the kiln without all being forced to the crown the kiln can be set to the top and the best of ware will be burned directly under the crown.

Observation and experience are fast leading me to advocate higher kilns, but not higher crowns, for down draft burning.

Cedar Rapids, Iowa.

TRUE ECONOMY—BIG PROFITS.

The reported profits of the Carnegie Steel Company has been and still is a matter of well-spiced interest to outsiders. The open mouth and the bulging optic have followed the figures as a sneeze follows snuff. In a comparison of prices in certain lines of product with those in Germany and Belgium, the Pittsburg Dispatch shows that pig iron was quoted at $22 per ton and billets at $36 in Belgium. At Essen, in Germany, Bessemer pig is $21.40 to $23.80 and billets from $30 to $30.50. At the same date Bessemer pig at Pittsburg was quoted at $24 and billets at $33. In rolled iron bars the quotations in this country were $43 per ton; in Belgium, $46, and at Essen, $49 to $51. Profits in some cases are not stall-fed or fattened so much by privilege and bounty as by improved processes of production, the best machinery and the wisest management, and the larger the mill the more the grist.—Age of Steel.

WRITTEN FOR THE CLAY-WORKER.

LONDON LETTER.

JOSEPH COWEN, THE MAIN PROP of the North of England progressive movements and once member of Parliament for Newcastle-on-Tyne, died recently. This excellent orator and thinker was a wealthy man of business and engaged in many industries. Brick works have been a part of the family possessions for a century and a half, and, including the Cowen colleries, they cover an area of nearly three hundred acres. Fire clay is produced from nine seams and the present yearly production amounts to about ten million fire brick per annum, besides other fire clay products.

Another death of particular interest to clayworkers is that of William Butterfield, who has been called the brickmaker's friend. As an architect he occupied a high rank, and scattered all over the country are excellent examples of his art, notably at St. Alban's, Holborn and Jesus College, Cambridge. During the earliest of the four decades of his working life, he fought against the prevailing prejudice in favor of all stone buildings.

Largely to his efforts must be put down the gradual change toward a favorable view of brick as material for public buildings. Mr. Butterfield detested bare and cold walls, and sought after color, variety and warmth by a judicious mixture of brick, stone and marble, with occasional mosaic work. This period marks the transition from the all-stone architect to the all-brick member of the profession.

Spring floods have done considerable havoc among the clayworkers. Yards have had to be entrenched and works fortified against the hydrous foe, and miles and miles of country have been lying under water. Damage of this kind cannot easily be insured against, the contingency being too haphazard and unequal, and therefore some losses have had to be borne at a time when trade might certainly be a lot more profitable.

New capital flows fairly easy into the brickmaking trade. In February alone eleven new companies were registered, with a total capitalization of $940,000. Not all of these, of course, are for public subscription, but at a time when the investor is as apathetic as he is just now, such a group of registrations indicates the high favor with which the clayworking trade is regarded in financial circles as a solid investment.

As an instance of successful joint stock trading in the British trade, the case of the clay firm of Stanley Bros., Ltd., is appropriate. The net profit of the institution during 1899 was $72,615, of which less than half sufficed to pay a shareholder's dividend of 14 per cent., the remainder going to reserve. So that things are not so bad in cases.

Ten years is allowed for the construction by the London County Council of the great new London thoroughfare, running north from the Strand. To start with, the Strand is to be widened by the gradual demolition of the Holywell street block. This ancient block stands right in the middle of the thoroughfare, in a manner of speaking, and narrows it down terribly. For a while only the houses and shops facing the Strand are to be pulled down. These extend five hundred feet and incude four saloons. This will result in the clearance of an area of about sixteen thousand square feet in the very heart of London and will widen the Strand there to full sixty feet.

The houses backing on those which are now being demolished are, of course, to come down eventually, but until they do they are to be hidden from the Strand by a great ornamented facade which will cover up their rears. Quite a mimic war is being raged round this feature. Eight architects are offering designs and stone, granite, marble and brick are variously recommended as material. Ten thousand dollars is set apart for this frontage, and the debate in the council as to the material was long and earnest. A strong section of the members are very strongly in favor of terra cotta, and they have cited the front of the great Constitutional Club as an example of the beautiful possibilities of the material. The successful architect will decide.

A new patent building brick is being put upon the market here which claims to be a big improvement. The stretchers (says the patent office specifications) have channels running longitudinally through them, while the headers have two channels running traversely through them. Besides the palpable advantage such a brick would possess in connection with cement, stucco and plaster work, it is urged that their weight is lessened from eighteen to twenty per cent., and therefore the material will provide just such an increased yield in bricks. The cost of drying is reduced, the bricks burn harder and more equal and make especially good damp resisting walls.

There is an increased demand for brick suitable for water works purposes in nearly every portion of the United Kingdom, and manufacturers of suitable material are quickening their rate of production. The ideal brick for water works purposes is, however, yet to be invented. Several clayworkers are chasing the elusive idea.

Whether it is to mean a serious crisis or not, one cannot tell yet, but there is no gainsaying the fact that the building trade in Scotland is in a condition of increasing anemia—a condition which might extend to England. Wages of carpenters are coming down at the run, and hundreds of masons are coming to England or are emigrating to the United States. All last year wages went up, up, ever up, and the direct connection of all this with the clay handling industry is evident. Should the present adverse tendency continue, there are equally bad times ahead.

Petersborough is coming to the front rapidly as the chief center for manufacturing brick by the semi-dry process. In this district the brick earth is Oxford clay, of which there are several square miles. Over a dozen prominent firms are working the country round there with profitable results.

Southport is a brick built watering place in Lancashire, at the mouth of the Ribble. Two hundred million of its brick have been supplied by an old brickmaker who has just died.

T. R.

INDUCEMENTS TO CLAYWORKERS.

The Board of Trade, of Rich Hill, Mo., is offering special inducements to competent persons seeking locations for vitrified brick or other clayworking establishments.

Rich Hill is located eighty-five miles south of Kansas City, on the Missouri Pacific and Memphis railways, and is the eastern terminus of the Ft. Scott, Wichita & Colorado railroad.

Rich Hill clays have been thoroughly tested and pronounced as fine as any in the West.

Located in the center of the great southwest Missouri coal belt, in a fertile country, with cheap fuel, abundant water, excellent railroad facilities, accessible to all markets, Rich Hill offers unusual advantages to manufactories of all kinds, but especially to clayworking industries.

Investors should investigate. For further information address John D. Moore, Secretary Board of Trade, Rich Hill, Mo.

The New Woman on a Brickyard.

At the Waldron brickyard, Havertstraw, N. Y., last week, a woman attired in men's clothes secured a job with the colored contingent. She trucked her share and hacked a half of the pit. The men are expecting her to fall when it comes to the wheeling of brick and the tossing of four brick at a time.

Written for The Clay-Worker:

HOLLAND'S BRICK INDUSTRY.

—An Opening for American Machinery.—

ONE OF THE MOST prosperous and flourishing nations of Europe to-day is Holland. Although in size and manufacturing industries a mere pigmy compared with Germany, this little kingdom is hastening along the road to wealth in so quiet, but withal so persevering a way, that other powers are apt to overlook the strides that the thrifty Dutch have left behind them.

One never hears anything of the blare of trumpets, which is so characteristic of Germany's progress. Nor does one hear, as in England, of colonial troubles and dissatisfaction. And yet Holland rules one of the most important colonial possessions of the world—the Dutch East Indies—and is developing it in a degree of thoroughness and rapidity unsurpassed anywhere else in the world.

Holland is, however, of necessity a trading country. Owing to the nature of its situation, it will probably never assume large proportions in the line of manufacture, at least at home. What cannot be accomplished in the old country, however, the Dutch hope to do in their offspring in the Indian ocean, in consequence of which manufacturing in the Dutch colonies receives the most careful nourishing and fostering from the great commercial centers of Amsterdam, Rotterdam, etc.

A few industries have, however, succeeded in gaining a good foothold at home, and chief among these is that of brickmaking. Twenty years ago Holland had everything to learn in the manufacture of brick. Only the crude and primitive methods obtained, German workmen had to be imported to operate the kilns, and altogether conditions pointed to unsuccessful results of the venture. At the present day, the country boasts forty-two brickyards, a constantly increasing industry and every possible facility for reaching markets. On the other hand, there is not a German employed in the country, the entire work being in the hands of the inhabitants of Groningen and Dreuthe, the two leading brick-producing provinces of Holland.

A very material aid to the growth of the industry is the location of the plants along the banks of canals, over which bricks can be transported to the markets at ridiculously low figures. Indeed, so nominal are the charges that a considerable portion of the production is annually carried over into Germany and sold in the Fatherland in competition with the local manufacture. This is particularly the case with the beautiful red tiles—characteristic of Holland—of which the Dutch make a specialty. Dutch bricks are machine made and baked by the 15,000 and 20,000 in ovens of the German type. An idea of the total production of the country may be gathered from the fact that last year the province of Groningen alone produced 17,999,000 bricks and tiles. The profits derived from this work amounted from 700,000 florins (about $280,000) to 1,000,000 florins ($420,000.) More than two-thirds of this sum passes annually into the hands of the workmen, a brickmaker receiving about 4 florins ($1.68) for every thousand bricks made.

In the matter of equpment, Dutch brickmaking plants are distinctly varied. On the whole, modern machinery may be said to be generally in use. Germany and Belgium divide the great bulk of the business of fitting the yards with appliances. The reputations of these two countries as builders of high-grade brick and clayworking machines are about on a par; consequently, there is keen competition among German and Belgium makers for Holland's trade. At present Schlickeisen (German) and Guillemin Freres (Belgian) claim the lion's share of Holland's imports of brick machinery. In their particular fields these firms are known as pioneers in the manufacture of modern machinery on the Continent.

Notwithstanding the sharp competition from the Continent, there would seem to be strong chances for American machinery in the market. In the first place our trade relations with Holland are good, as testified to by the yearly growing demand for American manufacturers throughout the kingdom. Furthermore, Holland finds it profitable to buy our machinery for re-exportation to the East Indies, and if she can afford to stand the higher prices, arising from heavier freight charges in her colonial trade, it is but reasonable to presume that similar conditions are applicable to the home trade. Again, American machinery enjoys an enviable reputation throughout the Continent for efficiency and saving qualities.

This reputation is well-known in Holland, although there is probably not a single specimen of American machinery to be found in any of the forty-odd plants. The reason for this, however, lies mainly at the door of American manufacturers, who have thus far put forth few or no efforts to establish themselves in the market. For the conditions of the trade may truly be defined in favor of the introduction of American machinery. Besides, there is any number of honest, energetic merchants who might be secured as agents, and relied upon to do good work in pushing the sale of their goods.

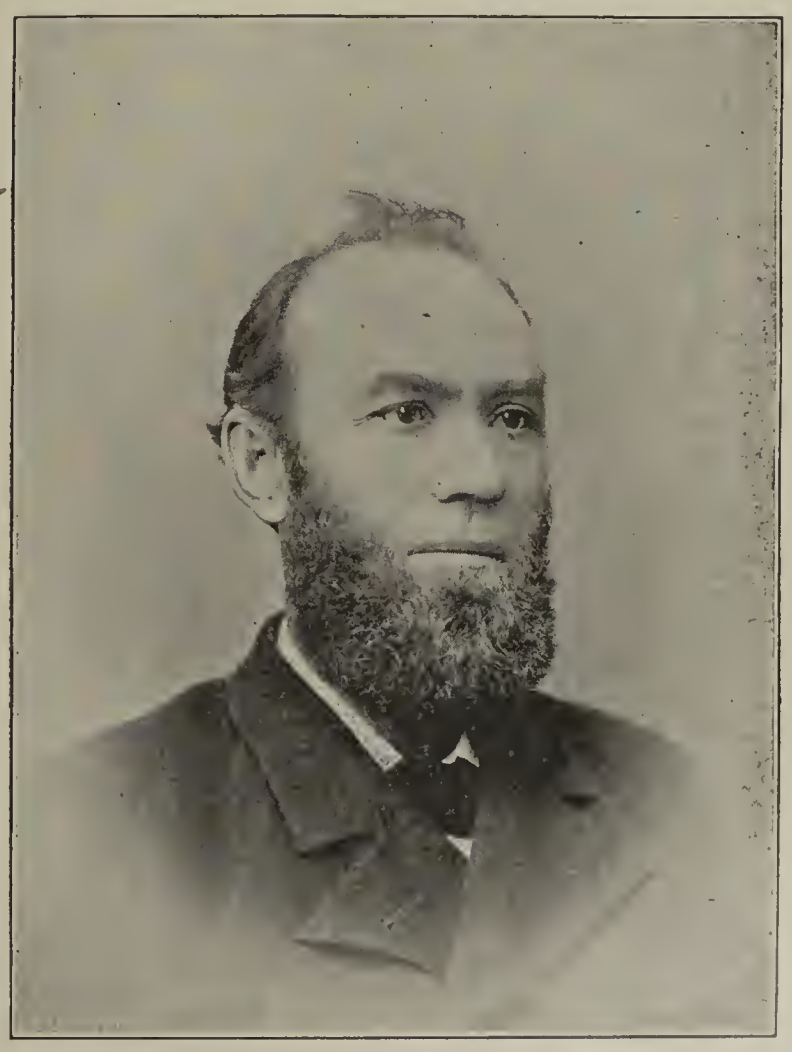
American manufacturers, in adopting this course, would also place themselves in line to secure business from Dutch colonies, since close connections exist between colonial merchants and the home trade.

It is to be hoped, therefore, that those of our manufacturers who are seeking to build up an export trade, will not overlook the little kingdom of Holland, but that, on the other hand, they will exert themselves to bring their machines under the notice of Dutch brickmakers by means as practical as those practiced by their competitors in Germany and Belguim.

OBITUARY.

D. H. Heager, Dundee, Ill.

It is with deep regret that we chronicle the death of D. H. Heager, of Dundee, Ill., of kidney disease. He was in his sixty-first year and leaves a widow and six children.



The late D. H. HEAGER, Dundee, Ill.

Mr. Heager was a man of great energy and force of character, and has amassed a large fortune in the brick and tile business, and other ventures. He was a conspicuous figure at the annual conventions of the N. B. M. A., of which organization he has been an active member for many years. His sterling virtues made him a valuable citizen, and his death is a great loss to the comunity in which he lived.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

THE CHICAGO SITUATION.

The Investment of $7,500,000 Awaiting the Decision of Labor.

Editor Clay-Worker:

The building situation for Chicago can be stated in a few words: "Negotiations pending, and complete stagnation." The contest between the Contractors' Council and the Building Trades Council has reached a point that will soon be a factor for good or evil, as the tempers of the different bodies may decide.

Failure on the part of the union leaders to indict either contractors or material men before the last grand jury has strengthened the contractors and weakened the unions, as within the last ten days overtures from the different unions have been made to the contractors which have resulted in a call by the contractors for a conference with the thirty-four unions affiliated with the Building Trades Council, to be held in the rooms of the Masons' Association, to-morrow, the 12th inst. The contractors hope to state their position so clearly that part if not all of the unions will see that it is to their advantage to cut loose from the political ring rule of the Building Trades Council.

In their call for the conference the contractors reaffirm their determination to recognize in no way the Building Trades Council. At Tuesday's meeting the contractors will have a valid argument to offer in a list of 18 buildings (including the government building) that are ready to start upon one day's notice when the strike is settled. The cash value of this work is over $6,000,000.00, and, in addition, there are a large number of smaller buildings in the city and suburbs which would easily add $1,500,000.00 to the figures quoted. It remains to be proven whether or not this condition of semi-prosperity will be taken advantage of.

—The Convention of Architects.—

The second annual convention of the Architectural League of America was held the 7th, 8th and 9th insts., under the auspices of the Chicago Architectural Club. The meeting was a success in every way and our visiting brethren now have a very fair idea of what Chicago is, even in a comatose condition as to their particular line. Including the Chicago Club, the following cities were represented: Cleveland, Detroit, Cincinnati, New York, Philadelphia, Pittsburg, St. Louis, Toronto, and Washington, D. C. Headquarters were established at the Auditorium, and the business sessions were held at the Art Institute, Fullerton Hall and the rooms of the Chicago Club.

The first social function occurred Thursday the 7th inst., a reception tendered by the Builders' Club at their rooms, 5 to 8 p. m. The spacious parlors were crowded with architects, contractors and builders, and it was an open matter of comment among the Eastern visitors to note the fraternizing spirit existing between Chicago architects, builders and material men. A dainty lunch was served, 6:30 to 8, and a generous punch bowl, with fragrant havanas on the side, formed a combination hard to beat.

Friday, at 1:30 p. m., two special cars of the Illinois Central conveyed a jolly crowd to Jackson Park, where three tally-hos were in waiting. A circuit of Jackson and Washington Parks made, and then a drive north through the attractive residence districts, through the heart of the city, across the river to the North Side, Lincoln Park boulevard, Lincoln Park, and a final anchorage at the Bismarck Garden, where supper was served to the accompaniment of a Hungarian orchestra. The celerity in which the steins were attacked caused one of the guests to remark that it was a crowd of good "draughtsmen," anyhow.

The last and crowning social feature was the banquet, Saturday evening the 9th, in the banquet hall of the Auditorium. It is hard to describe a function more perfect in surroundings and detail; suffice to say that with the exchange of kindly sentiment and good cheer, together with the substantials of the banquet board, all the visiting friends will have a kindly feeling for Chicago, and incidentally for the Chicago Architectural Club. The new president of the League is, of course, a Chicago man—Mr. J. C. Llewellyn, who is also president of the Chicago Club.

The next annual convention will be held at Philadelphia.

May 30, Mr. E. Kirk, Jr., secretary of the Builders' Club, was stricken with paralysis while at his office. Medical attendance was summoned and he was conveyed to his home in a serious condition. He is now convalescent, and his many friends hope for a permanent recovery.

"All work and no play" does not apply to the attaches of the Illinois Brick Company. Bowling is the present attraction, and skinned knuckles, lame backs, etc., are marks of distinction. May 25 a match set was played by the forces captained by C. B. Ver Nooy and Harry Ilett, respectively. I was present, but my ignorance of the game prevented me from enjoying the split poodles, railroad strikes and spares. I can safely venture that the National League is not watching them for phenomenons.

W. H. Alsip has the reputation of being the boss fisherman of the Illinois Brick Company. He returned from Twin Lakes this morning with a fine basket of black bass, three to four and a half pounds each, and one ten-pound pickerel. The latter, with a fine bass, was on exhibition at Mr. Alsip's office, but in some manner disappeared. I know of a press brick man who will have baked pickerel for breakfast to-morrow, and a prominent member of Mr. Alsip's present company will have bass "a la Alsip" at the same time. Moral: "Nail your exhibits before the other fellow nails them." VERITAS.

All's Well at Bucyrus.

Editor Clay-Worker:

I want to thank you for the complimentary notice you made of my "Change of Base" in the May Clay-Worker, and say I think you diagnosed the case correctly when you stated that the arrangement would prove mutually advantageous. At least, I am satisfied that I have taken a step forward in accepting a position with the American Clayworking Machinery Company. I have known, for years, that they were great hustlers, but am surprised to find how extensive their business really is. It is much larger than I supposed and, as a competitor, I thought I knew about what they were doing.

No one about the place is allowed to go to sleep, and I find I have all I can do, but it is work I like, so I am pleased with the situation. I have but one branch of the business (the manufacturing department) to look after and, consequently, can do more and better work than before, when I had to keep tab on everything.

Of course, I shall miss the companionship of the "tourists" whom I used to meet occasionally in my travels, but I expect to be with the boys and renew my youth at least once a year, when the N. B. M. A. meets.

Don't forget to change my address to Bucyrus, for I want a copy of The Clay-Worker for my individual use.

W. R. CUNNINGHAM.

Common Brick at $25 a Thousand.

Editor Clay-Worker:

I wish you would kindly advise me whether there is such a thing as dead cement. I have done a great deal of cement work in eastern Illinois and western Indiana, but I never had any trouble until this summer, when I cemented a water tank here in Elma. We had two different batches of cement. The first that we put on seemed dark and dull, and the next was of a light color and glossy and was all right, but the first let the water through. The tank is made of 2x6-inch stuff, spiked one to the other, and lathed so as to hold the cement. The walls stand up all right and look all right, except being dark. Now if you know what is the trouble, I would be much obliged for any information you can give.

I expect you will be surprised to hear from one out in this corner of the world. I have been intending to write you for

some time, but have neglected it. I get The Clay-Worker occasionally and never fail to read it through and through. I would have enjoyed the convention at Detroit. You certainly had a splendid convention.

I used to manufacture brick and tile near Danville, Ill., but came to Washington in 1890, helped to make one kiln of brick in 1895, and that is all that has been made in this neck of the woods. The kiln held 350,000 brick, all of which were sold out more than three years ago. There is an abundance of good clay here and plenty of water and wood. Brick sell at $25 a thousand, as they have to be shipped in from Seattle and San Francisco by boat. They are only used for building chimneys and bedding engines, and other work of that sort. There are very few brick buildings, as lumber is cheaper.

Times are flush just now; laborers get from $2.25 to $5 a day in the woods. I think I will make a kiln of brick next summer. Labor is too high to make brick all through the summer, though the brick will sell at a big price. Board is from $4.50 to $5 a day.

We will not have much of a crop of fruit this year on account of the late frosts, but all grain and potatoes look fine. Rough lumber sells at $5 a thousand, and dressed $12 to $15.

Wishing The Clay-Worker, which, by the way, I would not be without if I was in the brick business, the best of success, I am, yours truly, E. CRAM.

Elma, Wash., June 4, 1900.

St. Louis Notes.

Editor Clay-Worker:

The building situation in St. Louis is about like all other lines of trades. owing to prevailing strikes, and seems to be getting worse instead of better. There is no new work of any extent coming out and, as a rule, the builders think that the trade is over until fall. Favorable news from Washington regarding the World's Fair, in 1903, has encouraged everybody and there will be something to do here after awhile.

The official record of building permits for the first five months in the years 1899 and 1900 are as follows, and speaks for itself:

	Jan.	Feb.	Mch.	Apr.	May.
1899 ..	476,665	488,777	891,020	1,037,395	[illegible],676
1900 ..	421,988	534,478	424,996	579,353	411,231
Inc. ..	.....	45,701	.....	.....	.....
Dec. ..	54,667	.....	466,024	458,042	140,445

Mr. W. P. Grath has gotten out another patent kiln which combines the features of a continuous with the regular downdraft and can be used either way. The fire brick and sewer pipe industries report having all that they can do. Work in the terra cotta factories is slacking up; prospects are for a strike in some of their departments in the very near future. An organization has been perfected among the allied building trades which would work satisfactorily if there was anything to work upon. The Progress Pressed Brick Company is making very handsome gray, buff and mottled brick and will soon be in the market with a full line. We are going to have another skyscraper in the shape of an office building for the Bank of Commerce, to be erected on the southeast corner of Broadway and Olive street, Isaac S. Taylor, architect. Work on the new Washington University buildings, costing $500,000 or over, will start soon. Mr. J. H. Bright, contractor, will erect them. LOUISIANA.

Notes From Wellsville, Ohio.

Editor Clay-Worker:

The present outlook in the potting district is very serious. Trouble has arisen at the Laughlin China Company, which is one of the largest potteries at East Liverpool.

The dispute grows out of the interpretation of the new wage scale adopted last February by the manufacturers and operators of this country. The kilnmen, after working out their two weeks' notice, walked out last Friday. Under a recent agreement adopted by the Manufacturing Potters' Association, of East Liverpool and Wellsville, every pottery in the two cities is bound to shut down whenever a strike at any one plant against the arbitration board's interpretation of the new scale closes that plant for a longer period than three days. The arbitration board has been working on the trouble ever since. They have arranged for a conference for to-morrow. The brotherhood hope they may come to some settlement with the manufacturers, but if no settlement is made we may witness one of the longest strikes the pottery district has ever seen.

A strike means a serious thing to this place and East Liverpool, for potting is the principal industry, and will throw thousands of men out of employment.

June 5. A Ceramic Chemist.

DOWN IN JERSEY.

A Very Busy Clay Center.

Editor Clay-Worker:

After many months' absence I will endeavor once more to keep your readers posted regarding progress in the clay industries of "down in Jersey."

The brick and clay business and its various branches have simply been out of sight for the past year.

One can hardly realize this fact without some wonder as to the vastness of America, and indeed the outside world, for that matter, for clay products of this part of Jersey go to all climes.

Perth Amboy, the great center of Middlesex county, the most wonderfully productive clay district in the State, if not in the world, has had, and indeed, is now having, a wonderful growth.

One of the greatest copper refining establishments in the world has located on the old William Watson property, formerly used by the Watsons as a fire brick factory site. The Raritan Copper Company have consumed several million common brick in the construction of this vast plant, and are still at it. This company employs upward of 500 men.

Another new enterprise consuming vast quantities of common brick is the Standard Underground Cable Company. The most substantial buildings have been erected by this company and all of brick.

But one of the finest improvements in an artistic way is a new high school building for Perth Amboy. This also is of red brick with terra cotta trimmings. Many store buildings are now being erected and as they are within the fire limits, must be of brick. We also now have a trolley line covering the city pretty thoroughly. This is owned by the Raritan Copper Company and shows their faith in the ultimate growth of this city.

There is a demand to-day for 200 dwellings in Perth Amboy, and notwithstanding every mechanic in the city is busy, the houses cannot be built fast enough to supply the demand.

While the majority are of frame construction, brick are used exclusively for foundations, as there are no stone quarries in this section.

Of course, this makes a large demand for good, hard brick, and consequently the brickmaker is reaping a harvest.

Perth is now preparing to pave a street with brick. The one block at the Tottenville ferry landing, paved some two years ago, has stood the test so far, but as this is a very heavy grade heavy traffic has to pass by way of another street.

Since my return home I have had occasion to examine the brick placed upon the Highland Park hill at New Brunswick. These brick were placed after quite a controversy. A letter of the writer to one of the city papers, placing before its readers much data regarding the number of paving brick made in the United States each year, was read before our board of freeholders, and without doubt had some weight in the final decision to place the brick.

These brick were end cut and we thought from an examination at the time they were too glossy or brittle. They were laid with about one-half inch space between to allow horses to get a better hold. We think this a mistake, as an examination a very short time ago showed much chipping and many of the brick will doubtless be ruined within another year, simply because they were not a vitrified brick, as we understand the term.

We have the first accident to hear of on the hill, though it was claimed horses could not climb the hill if paved with brick.

If those who furnish the first pavements hereabouts will only put the best quality down, there is a vast field for future working in these Eastern towns and cities.

Macadam is no good for streets. It is a continual dust pan in summer.

Asphalt is too expensive to keep up and too slippery.

All the factories and yards are running well up to capacity, and shipping everything made. The terra cotta industry is not quite as brisk as it might be, but we suppose the extreme high price of steel has had a depressing effect on building, and therefore the larger buildings into which goes the greater quantity of terra cotta are not progressing at a rate near up to the capacity of the various works.

We paid a very pleasant visit to the Edgar Bros. Company's

plant at South River a few days ago. Here we found our old office fellow, Mr. Wilson, in charge of the office. This plant has been recently built by Messrs. Charles S. and Milton Edgar. Both gentlemen have had years of experience as miners and shippers of clays. Charles S. Edgar is the owner of the famous Edgar mines at Edgar, Fla., from which place he supplies the white ware potteries of all over the United States with ball or washed clay. Milton Edgar is one of the foremost politicians of the county, as well as a clay dealer.

The plant is very handily arranged, and joins the North American Pyro Granite Works at South River, this county. The clays are brought in from the banks near by and from the samples shown, both of front and fire brick, they will command a share of the trade in manufactured product as well as in raw clay. We found in immediate charge of the manufacture of the brick our old friend, Mr. William Weir, formerly with the C. Pardee Works, of Perth Amboy. We desire in the near future to give a complete description of this and other plants, so will reserve our powder for future use.

We also called at the works of the Enameled Brick Works, at South River, to see friend Jacquart, but found him not, being out for the day.

Brick (common) bring $6.50 delivered in Perth Amboy. This should net the maker about $5.50 at the yards. As we have not visited any of the common yards yet we do not know exact quotations.

Henry Maurer & Son, at Maurer, are just finishing three very handsome cottages designed and made from there own product. The only wood in these cottages is the doors and window frames, and slats to fasten tile roofing to.

A new water plant is now being placed in position. The writer drilled two wells some time since some 3,000 feet west of the factory. An air compressor has been placed in the factory, and the wells will be pumped by air pressure by laying pipe to the wells. A sixty-foot steel tower of their own construction has been erected near the railroad station. A 20,000 gallon tank will be placed upon this tower to supply the numerous houses of the town.

We regret to record the death of Mrs. John Philffer, recently, at the residence of her husband at Maurer. Mr. Philffer is the superintendent of the immense plant of Henry Maurer & Son, and is known throughout this section as a progressive clayworker. All who know him will sincerely mourn with him in the loss he has sustained. An interesting family of five children are left motherless, the oldest thirteen years and the youngest three years.

In our next we shall endeavor to describe a new kiln recently built by M. D. Valentine Bros. & Co., at their Lehigh Valley railroad works.

We spoke of one similar at their Woodbridge plant several years ago, and wondered then why brickmakers did not take up this idea. It is certainly a success with them. Shipments from this plant are heavy right along. W. R. O.

Metuchen, June 6, 1900.

BRICKYARD CONUNDRUMS.

How does a burner differ from other mortals? He may lose his head without losing his head, or he may lose his head, and by losing his head lose his head.

Why is a kiln a gluttonous thing? Because she must be dressed five or six times a day, and every time she is dressed she must also be fed.

What is the brickmaker's favorite conveyance? The hack.

What is his favorite fish? The hake.

What is his favorite musical instrument? The loot.

What creature does he most abhor? The bat.

Why is the brickmaker a dangerous character? Because the more rows he makes the happier he is.

When is a brickmaker like a hen? When he begins to set.

What dreadful accident was that which happened to the burner? His mouth fell down.

Why is a burner like the father of a large family? Because he has many mouths to feed.

Why is a well-built clamp kiln like a well-managed ship? Because each has a carefully prepared log.

How should the brickmaker's wife wear her hair? In a pug, of course.

An Expensive Fire.

One of the large plants of the Savage Fire Brick Company was destroyed by fire at Keystone Junction, Md., on the Baltimore & Ohio Railroad, May 16. The loss is $50,000, with $10,000 insurance. The plant was erected in 1870, and had a capacity of 2,000 bricks daily. It was with difficulty that the town was saved. Fortunately the wind turned just in time. The fire was started by a spark from a locomotive. J. J. Hoblitzell is the owner of the plant.

CAPITAL BRICK AND BUILDING NEWS.

PRODUCTION OF BRICK and the laying of them in structural design still goes on here to the satisfaction of manufacturer and builder. The good times have brought into the field of brickmaking another company—The District Brick Company—the plant of which is situated within the city limits. This enterprise is an independent one, i. e., not being of those that find their market through the Standard Brick Co.

The output of the new company will find ready sale, for the demand is ample and steady; in fact, it is very probable that a few months hence the brick supply will fall below the number required. Of course, as mentioned in a previous letter, the Government will take a large part of the product. The new Bureau of Justice building alone will use about 4,000,000 brick, as that structure is to be built almost entirely of this material. Terra cotta trimming will be employed, and quite a handsome edifice will be the result.

It was the desire and intention of the attorney general to erect for this department a structure of stone or marble; but Congress would not add the necessary $900,000 to the $1,000,000 already given for the building, and so the attorney general very sensibly determined to use brick and terra cotta for the work. But he says, in speaking of this matter, that the "inside finish will be like that of any cheap office building," and "I will erect the building of terra cotta" (evidently brick). "That, with a cheap finish, will enable me to keep within the money in our hands."

And, it is stated further, that owing to the great advance in the cost of labor and building material the bids have shown that the edifice could not be made "imposing" for less than $16,000,000.

From observation and from a common sense standpoint, I venture to say that a building can be made not only "imposing," but also beautiful, by the proper use of brick and terra cotta. Buff or gray brick for outside work, combined with dark terra cotta trimming and columns of latter material, would give a very fine effect.

This can be accomplished. The largest single brick building in the world—the United States Pension office—cost but $900,000—$100,000 less than the amount given for the Bureau of Justice. This (the Pension office) is not, outside, a thing of beauty architecturally, but it is 400 feet long by 200 feet wide, and 159 feet high, employing in its make-up 15,500,000 bricks. Inside, the huge edifice, with its colossal terra cotta-capped columns, its rows of smaller columns, graceful gallery arches and its fine floors, etc., is very attractive. So it seems to me the attorney general can, with one million of Uncle Sam's dollars, get justice, a whole bureau of justice, architecturally, and "have a good run for his money."

The site for the new Bureau of Justice is very close to a handsome brick and terra cotta structure, Lafayette Theater, and it (the Bureau) will have another attractive neighbor, the Rigg's bank building, now under construction. The old Rigg's bank building is one of Washington's ancient landmarks, and is not without historical interest. It was, in the long ago, the Washington branch of the old United States Bank, and from it Andrew Jackson drove the employes and stopped the business. Mr. W. W. Corcoran, Washington's greatest philanthropist, once was partner in a banking business there. Mr. Corcoran began business life as a shoemaker and became a millionaire, but not by making shoes. He assisted in negotiating a loan for our Government during the Mexican war and by speculating in the bonds issued for the loan, became very rich.

As the years go on the legislative department of the Govern-

ment seems more and more impressed with the progressive spirit in building federal structures instead of renting them at great cost. One of the latest ideas in this respect concerns the Agricultural Department. It is proposed by the Senate Committee on Buildings and Grounds to appropriate $200,000 for laboratory buildings for that department. At present the laboratory work is done in houses owned by private individuals, and they cost the Government $10,000 a year for rent. The work carried on in these houses—that belonging to the divisions of chemistry, vegetable, physiology and pathology, soils, botany and animal industry—is of great importance, and should have better quarters than is now the case. All buildings where Government work is performed should be Government property.

It is possible the Washington brickmaker will also find a Government market for his product to be used in a new municipal hospital for the District of Columbia, to be built in the not distant future. The cost of this for the site alone will be about $100,000. And another Government enterprise, which will take not a few brick, for houses, foundations, etc., is a filtering plant for the city's water supply. For preliminary work in this interest $200,000 have been appropriated. The whole cost of a plant of this kind for Washington would be not much less, if any, than $2,000,000.

The Washington acqueduct system has been a most expensive affair; it has taken in its construction millions of brick, untold tons of stone and iron and has cost over $10,000,000. The water pours through the distributing system at the rate of 50,000,000 gallons daily, and the citizens here have become so accustomed to an "inside" mud bath, seasoned with several kinds of bacteria, that clear filtered water will surprise their stomachs.

From the recent destruction of the Washington Hydraulic Brick Company's plant when, on May 13, everything belonging to the plant, except the stables, was destroyed by fire, it was thought there might be a scarcity of colored brick produced here. But I was informed at the company's office that there was enough of this material on hand to meet demands for a time, and that the plant would be again in operation in a few weeks.

It is probable that the Hydraulic Company will furnish a portion of the brick for the Government Printing office, as will the other factories here. The foundations of the printing office are all laid, except a small portion, and work of erecting the edifice will begin as soon as the steel for the inner structure can be obtained. There has been some difficulty in getting the steel framing on account of general rush in steel and iron industry.

By August 1, the District of Columbia will be short one brickmaking company, the Washington Brick Company, of which Mr. Theodore Holbrook, president of the Standard Brick Co., is president. The plant of the Washington Company is to be moved to Waterloo, Va., where it will, as at present, furnish brick for this market. The State of Virginia has had a number of her distinguished sons domiciled in this city, as President of the United States; but she has been more largely and lastingly represented here in her clay products than any other state in the Union.

But there is one item in the brick list that concerns the manufacturer "at large." This is that which has to do with the city's streets—vitrified bricks. Bids for these are received at the District office in May and June, and where possible it is desired that the bidder submit samples of material for inspection. Bids for terra cotta pipe will also be received. The number of vitrified brick estimated for last fiscal year, ending June, 1900, was 2,500,000.

There is a gradual increase in the use of these brick for street work here for they are far superior to anything else in their employment for gutters, as yet the chief use to which they are put on the streets. The alleys here are very largely paved with brick, and every year finds additional area of street roadway improved by vitrified blocks. Last year about 10,000 square yards of street roadway were thus improved, to the exclusion of asphalt, which, in many respects, is inferior to brick, especially when the latter are laid upon a substantial base. NICODEMUS.

Washington, D. C., June 1, 1900.

A MONUMENT OF ENAMELED BRICK.

In order to preclude the possibility of a contest over his will after he is dead, John G. Taylor, of Westchester, Pa., is now engaged in expending a fortune of $100,000 in monuments. Mr. Taylor's avowed purpose is to use all his money in improving Lafayette Cemetery, on the heights of Brandywine battlefield, a short distance from the spot where General Lafayette fell wounded in battle. The bodies of Taylor's father, mother, sister, wife and child are buried there. Quietly and without ceremony Mr. Taylor, yesterday, unveiled his fourth monument. The shaft is of white enameled brick, containing a niche in which is a life-size figure of Christ in marble. The statue was made in Carrara, Italy. Near this pile Mr. Taylor has completed the base of a $25,000 monument commemorating General Lafayette.

SLUMP IN IRON MEANS INCREASED BUILDING.

We note with interest a break in the prices of iron. Many important building operations have been held back by reason of the unusual high prices for all building materials. While there has heretofore been nothing that promised any lowering of prices we believe the break in the iron market indicates a general recession upon the part of manufacturers from the high figures which have prevailed for some time. If such should prove the case we can expect a veritable boom in building operations, for the many contracts which have been held in abeyance by the ruling high prices will now be pushed to completion. We trust these conditions will soon be realized.

POOR OLD KENTUCKY.

The Martin (Tex.) Democrat don't like Kentucky nohow. .. thus depicts the troubles that beset the denizens of the Bluegrass State:

Man born in the mountains of Kentucky is of feud days and full of virus. He fisheth, fiddleth, cusseth and fighteth all the days of his miserable life.

He shunneth water as a maddog and drinketh much mean whisky.

When he desireth to raise h— he planteth a neighbor, and lo! he repeateth twenty-fold. He riseth even from the cradle to seek the scalp of his grandsire's enemy, and bringeth home in his carcass the ammunition of his neighbor's wife's cousin's uncle's father-in-law, who avengeth the deed.

Yea, verily life is uncertain, and he knows not the hour that he may be jerked hence.

He goeth forth on a journey half shot, and cometh back on a shutter shot.

He riseth in the night to let the cat out, and it taketh nine doctors three days to pick the buckshot out of him.

He goeth forth in joy and gladness and cometh back in scraps and fragments.

A cyclone bloweth him into the bosom of his neighbor's wife, and his neighbor's wife's husband bloweth him into Abraham's bosom before he hath time to explain.

He emptieth a demijohn into himself and a shotgun into his enemy, and his enemy's son lieth in wait for him on election day, and, lo! the coroner ploweth up a forty-acre field to bury the remains of that man.

Woe! woe! is Kentucky! for her eyes are red with bad whisky, and her soil is stained with the blood of innocent moonshiners.

The Burns (Kan.) Citizen says of itself: "Our paper is not the best in the world, but if you can show us that it is not worth 2 cents we will eat the next issue. First you read it, then you will spread it over something, then clean your lamp with it, and then use it to start the fire; and if tnat doesn't make it worth 2 cents, at the present price of lumber, why don't take it."

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIII JUNE, 1900. No. 6.

CURRENT COMMENT.

Throughout the length and breadth of the land is heard the voice of the young graduate. Commencement time is upon us and marks the dividing line between the school and work-time of life for many an ambitious lad and lassie, who now face the world with high ideals.

* * *

That all are not imbued with hi-falutin notions is evidenced by the class motto of the Concordia, Kan., high school graduating class, "Beyond this lie the washtub and the sawbuck." Though intended as a mere humorous figure of speech, not a few of the young enthusiasts may find, later on, that it is no joke, but will realize by stern experience that "Many a truth is spoken in jest."

* * *

Our neighbor, J. C. Adams, the "Brickmaker to the President," sails for Europe, July 7. He will spend eight weeks in Paris and other notable places in that quarter of the globe. Being a keen observer, we anticipate that on his return he will tell our readers something interesting about the clayworking industries over there. He will be accompanied by his daughter, Mrs. Adams declining to make the trip, he says, until a bridge is constructed, so that she can make the journey by rail.

* * *

There has been little or no change in the labor situation since our last issue. As a result the building interests in many of the large commercial centers are in a comatose state. St. Louis is doubtless in the worst predicament, her street car strike paralyzing all lines of trade. It would seem as if stringent measures should be adopted to prevent the lawless rioting that occurs there daily. Whatever may be the claims of either the street car company or its employes, law and order should prevail. He who violates the law, whether in the name of a great corporation or a trades union, should be punished in a manner to make him respect the rights of others and obey the law.

BRIBERS GO TO JAIL.

Northumberland county, Pennsylvania, has recently been stirred from center to circumference by a scandal growing out of the bribery of a number of councilmen of the town of Shamokin. Rumors of crookedness reached the ears of the burgher, or chief officer of the town, who trapped the councilmen and those who had offered them bribes, and then brought them before the grand jury, where indictments were found. The guilty parties were brought to trial and a majority of them convicted and sentenced to imprisonment. We regret to say that among the latter were one or two well-known paving-brick manufacturers. They claimed to be innocent of actual offense, but, like old dog Tray, have to suffer the penalty of evil associates. The punishment of the guilty parties will have a salutary effect in that locality, and it will be well for others who are tempted to dispense cash favors among those whose influence and patronage they hope to secure, to think of what has transpired in Northumberland county.

A CHECK TO MUNICIPAL IMPROVEMENTS IN INDIANA

The Barrett law is a measure enacted by the Indiana legislature for the purpose of enabling cities to inaugurate and carry on public improvements and providing for the payment of same on the installment plan. That is, property holders so desiring are given the privilege of paying in ten annual payments. The deferred payments being secured by the issue of bonds bearing 6 per cent. interest, and become a lien against the property. This affords ample security, and the bonds have been in great demand among investors.

During recent months some questions have come up as to the legality of certain features of the law, and court decisions have been rendered both favorable and unfavorable to the law. The most recent decision of the supreme court in Indiana declares the law to be unconstitutional and, as a result, many proposed improvements will be deferred until the State legislature is again in session, when undoubtedly the law will be so amended as to overcome the objections. The law has been so beneficial in its effects that it will certainly be re-enacted on safe lines. In the meantime but few public improvements will be attempted, except where the unanimous consent of all interested property holders can be obtained, in which case contractors are perfectly safe in carrying out street improvements, etc.

IMPORTANCE OF GOOD CONSTRUCTION.

Paving material of any kind, or structural material of any kind, for that matter, is subject to defeat and disaster in poor workmanship. Paving brick is not unique in this matter, as anyone may see who will scrutinize other pavements. In every locality where any considerable quantity of asphalt or wooden block pavements have been laid, numerous failures have occurred, the result of poor workmanship or improper construction. The same is true of brick, though in a less degree, for brick is a better and more durable paving material than either of the others.

But, somehow, the failure of brick streets seems to cause more talk and noise than is heard in connection with the other materials. We sometimes wonder if this is not due to the "influence" and moneyed interests behind asphalt and wood. The former, particularly, is represented by organized forces that smooth down rough criticism if they do not strengthen weak pavements. With an equally strong organization behind it the paving brick interest would soon outstrip all competition. It will do this ultimately, because of the superiority of the material itself, but the advance will be slow, for want of organized effort on the part of the paving brick manufacturers. Acting as individuals, and competing, one against an-

other, they cannot accomplish the results that might easily be attained by concerted action.

The paving brick interests certainly ought to combine on one proposition. That is, the requirement of the best and most improved methods of construction, for in this lies the key to success. Good paving brick are practically indestructible, and brick streets, when properly constructed, seldom, or never, fail to satisfy every requirement. Nine-tenths of all the failures are due to poor work or improper methods of construction. Realizing this, paving brick manufacturers may well encourage every effort looking toward the better construction of brick streets.

TERRA COTTA BECOMING POPULAR.

There is a marked increase in the use of terra cotta, as there should be, for it is unquestionably the most durable and at the same time the most artistic material that enters into modern building. We mean, of course, for exterior ornamentation. There was a time when terra cotta meant a darkish red material, but of late years terra cotta has been made of various shades and colors—any color but red—until it is no longer associated in the public mind as a mere ornamental feature to a red brick front. We were strongly impressed with this phase of the subject recently, when, in passing an imposing structure in course of erection, we were attracted by what seemed at first glance to be some exceptionally beautiful stone work. A closer inspection developed the fact that it was not stone work at all, but terra cotta. So closely does it resemble stone, both in texture and color, that even an experienced eye might well be deceived. The ornamental features are so elaborate, so beautiful that to produce them in stone would mean an unreasonably large expenditure. In terra cotta the cost is moderate compared with the results obtained and the material is really more durable, being fireproof. With such examples of artistic decoration, it is little wonder that terra cotta is constantly growing in favor among architects and builders.

THE PREVENTION OF LOSS BY FIRE.

We are often more impressed and know more of a man by small incidents relating to his life than by his larger performances. Edward Atkinson is probably known to more people in this country in connection with his attitude toward the Philippine policy than through the main work and the large accomplishments of his life. Primarily he was an economist, and has been of great service to the people of this country in manufacturing, commerce and merchandising and domestic science. People, however, are more apt to see a little sparkling thing than a great bulwark of large accomplishments secured by quiet, industrious methods.

Edward Atkinson is president of the Boston Manufacturers' Mutual Fire Insurance Company, and it is not because this company is mutual that it is successful. It is successful because it has studied the cause of fire and done every physical thing possible to prevent these fires from becoming destructive. It is unquestionably the most successful because the most scientific insurance organization in the world. As stated in a former article, this company carried $111,000,000 of insurance, with only $35,000 of loss during the year 1898, and $120,000,000 at risk in 1899, and only $65,000 of loss.

Mr. Atkinson has been president of the company for years, and has been more influential in the direction of low-cost insurance than any one certainly in this country. In this work of reducing the loss by fire, because of its business-like and higher scientific methods, everything relating to the character of the various industries and business have been studied, all of the peculiar conditions growing out of particular lines of work and occupation have been analyzed with a view of establishing the lowest possible rate of loss.

Mr. Atkinson has said, "Fires must and will occur. The problem is how to prevent them from becoming destructive." He has been a veritable insurance missionary, working in the interest of the property which he represented, or was protecting, and at the same time giving to the country results of his great experience in valuable literature which he has issued from time to time. In a recent publication, "The Prevention of Loss by Fire," he says: "It seldom falls to a business man with no knowledge of science to find his place in an occupation which makes it necessary for him to become somewhat familiar with all the physical sciences and to select experts in every branch. The function of the writer has been to meet all the new hazards of fire as they come up, to select thoroughly trained men, to study and establish safeguards for each case, and to convert the technical language of the scientist into terms that may be within the easy comprehension of the practical mill managers, to the end that they may be applied, not because insisted upon as conditions of issuing policies of insurance, but through the complete understanding on the part of owner and agent that such safeguards are due to the protection of the property without any regard to any supposed interest of the underwriters therein."

ROOKWOOD POTTERY AT THE PARIS EXPOSITION.

A letter from President W. W. Taylor, of the Rookwood Pottery, who is in Paris, says that the exhibit of Rookwood at the Paris Exposition is attracting much attetnion. Purchases of a goodly number of pieces were made the day he wrote by the German Government for the Royal Berlin Museum, and purchases have also been made for American museums of art and art academies. Thus it can be seen that there is recognition of Rookwood coming from the continent and from the home country as well.

THE MOST DANGEROUS TRUST.

There is a world of demagogism in the current outcry against trusts. Capital will combine, and, while the final result is cheaper goods, as at the department stores, and large manufactories, nothing can be done to suppress them. If a Standard Oil Company can furnish oil to consumers cheaper than small operators can, the people will patronize it, but when a combination, by force, prevents competition, then the people ought to rebel. The whisky trust crushes out private distileries only by furnishing its product cheaper than the small distilleries, just as great railroad systems or trusts furnish railroad facilities that cannot be furnished by a dozen or score of independent lines. If, by any species of cumpulsion or combination other than the greater facilities for business afforded, these or any other trusts prevent competition, it will become the duty of the people, through legislation, to suppress them.

No business is in more peril from trusts than the building industries. The most extensive trust yet organized is the confederation of labor organizations. It is so complete and ubiquitous as to hold the building interests of the whole country at its pleasure. The employment of a non-union plumber on a building which requires millions of brick stops the building at once; even the use of any building material not made by the trust (union) is sufficient to stop the whole machinery. The immediate sufferers are the contractors, but the greatest are the brickmakers, who cannot well become a part of the trust. Next to these is the farmer and gardener. While the price of everything the farmer buys, from a plow to a yard of calico, has advanced under the well organized trust of labor organization, his products have never, since the earliest days, been as cheap as they are now. This all comes of the machinations of the trust of organized labor, which will not allow those not in it to work in any trade with which they are connected. There will come an end to this. When and how is not apparent.

THE GRAY OLD BOYS IN BLUE.

The boys in blue have come to town—the gray old boys in blue.
A little aged and bent, perhaps, but soldiers through and through.
There may be missing arms and legs, and many of them lame,
But still you'll find their hearts are in the right place just the same.
They cannot swing a saber and they cannot aim a gun,
As when they hurried to the front 'way back in sixty-one.
But they can look you in the eyes, as only soldiers do—
The fine old boys, the brave old boys—the gray old boys in blue.

What matters it if you have heard their stories oft before?
'Twill do you good to listen to the same old tales once more,
Of how the boys at Shiloh or on Chickamauga field
Made up their minds to do or die, and swore they'd never yield;
Or, how they marched for days and nights, as weary as could be,
Behind the grand old Sherman from Atlanta to the sea.
When men like that are talking it is well to hear them through—
The stanch old boys, the true old boys—the gray old boys in blue.

The boys in blue have come to town; come, grasp 'em by the hand,
And call each soldier "Captain," though he never held command;
And make him feel you love him, that it's ev'rybody's whim
To turn the city over to his soldier friends and him.
For the roll-call will be finished e'er a score of years has past,
And before the Great Commander all will rest "at arms" at last.
So, as long as they're amongst us, let us give to them their due—
The dear old boys, the grand old boys—the gray old boys in blue.

—Louis Weslyn Jones, in Indianapolis Press.

SATAN'S SOLILOQUY.

Satan sat outside of Eden,
On one melancholy day,
Near the flaming sword was hanging,
Guarding Eden every way.
In a spell of bitter musing
Thus did he soliloquize:
"Though I am an imp of darkness,
I was fond of Paradise."

And his feelings were revengeful,
Every tone with malice rife;
So he said, "I'll not be thwarted,
I shall strike the tree of life.
I shall not look like a serpent,
Crawling on the grassy ground;
I shall be a thing of beauty,
I shall be a ruler, crowned.

"In the sparkles of the wine cup,
In the ruby liquor's foam,
I shall live and reign in power,
Govern every life and home.
I shall aim at people's reason,
Nourish every brawl and strife,
And when heart and brain I poison
I shall strike the tree of life.

"Alcohol shall rule the people,
And the people crown me king.
In my right hand, for a scepter,
I shall hold some noxious thing.
I shall use a plant so poison,
Taking richness from the ground.
All the earth will soon grow barren
Where tobacco leaves are found.*

"There's a power in the poison
Of its showy foliage green
That will make men's life pulse weaken—
They shall call it nicotine.
Where tobacco fumes are rising,
Where my alcohol can shine,
I have power to rule and conquer,
And the tree of life is mine."

With a grin of satisfaction,
Satan started on his tour,
Taking then two kinds of poison
To augment his evil power.
Alcohol, the curse of ages,
And the deadly nicotine—
Satan's choosing, none refusing,
Strike the tree of life unseen.

—Josephine Llewellyn.

*A part of the human brain is called the tree of life. Tobacco plants soon exhaust the richest soil.

TABLE OF CONTENTS.

Old French Brickwork 519
Fire Brick: Their Manufacture and Uses 520
Wedgwood 522
Button-Hole Talks 524
Murrell Dobbins' Sanitary Vitreous Ware Plant 525
Women and Strikes 526
Among the Pittsburg Clay-Workers 527
Brick Pavements in Greater New York 528
Some Costly Bits of Experience 531
Exact Instruments for Clay-Workers 532
The Bond of Brickwork 534
A Busy Georgia Brick Plant 535
New York's Use of Brick 537
In a St. Louis Sewer-Pipe Factory 538
From the Monongahela to the James 539
Crowns of Kilns 542
Inducements to Clayworkers .. 544
The New Woman on a Brickyard 544
Holland's Brick Industry 545
Obituary 545
A Monument of Enameled Brick 549
The French Clayworkers' have an Organ 552
By the Light of the Kiln Fire .. 558
A New Kind of Chimney Brick 559

CORRESPONDENCE.

Notes From Tide Water, Va ... 535
The New York Brick Market .. 541
London Letter 544
The Chicago Situation 546
All's Well at Bucyrus 546
Common Brick at $25 a Thousand 546
St. Louis Notes 547
Notes from Wellsville, Ohio ... 547
Down in Jersey 547
Capital Brick and Building News 548
Pacific Coast News 560

EDITORIAL:

Current Comment 550
Bribers go to Jail 550
A Check to Municipal Improvements in Indiana 550
Importance of Good Construction 550
Terra Cotta Becoming Popular. 551
The Prevention of Loss by Fire 551
Rookwood Pottery at the Paris Exposition 551
The Most Dangerous Trusts 551
Editorial Notes and Clippings. 554

MISCELLANY:

A Nineteenth Century Miracle 521
Punching Holes with a Rifle .. 525
How to Get Rich 536
Profoundly Pat 536
The Voice of Experience 538
No Sense in Forgetfulness 540
Do One Thing Well 540
True Economy—Big Profits 543
Brickyard Conundrums 548
An Expensive Fire 548
Slump in Iron means Increased Building 549
Poor Old Kentucky 549
The Gray Old Boys in Blue 552
Satan's Soliloquy 552
An Ill-advised Venture 558
A Good Story on a Popular Milwaukee Brickmaker 559
An Optical Delusion 560

Index to Advertisements on Front Inside Cover Page.

THE FRENCH CLAYWORKERS' HAVE AN ORGAN.

La Brique is the title of a new journal published in Brussels It is a well printed publication, of course in the French Language, and deals with brickmaking and clayworking in a serious and practical way. Like all foreign journals of its class it goes into the details of clayworking in a most thorough manner and appears to rely for success more largely upon the value of the information which it gives and its high technical character than upon advertising patronage. A journal of this character in America could hardly exist beyond the first month of its publication. It is expected of a journal in this country that a very large amount of technical and other practical information should be furnished, and that the advertising matter should carry the cost of circulation and distribution. Not so with La Brique, it is devoted to carefully written, highly scientific essays which are of value to brickmakers of France and they are expected to support the magazine by cash subscriptions. The yearly price is $1.50, as will be seen by referring to their ad. on page 572.

SAVE THE DROPS

WE HAVE just entered our third order for 90 gallon

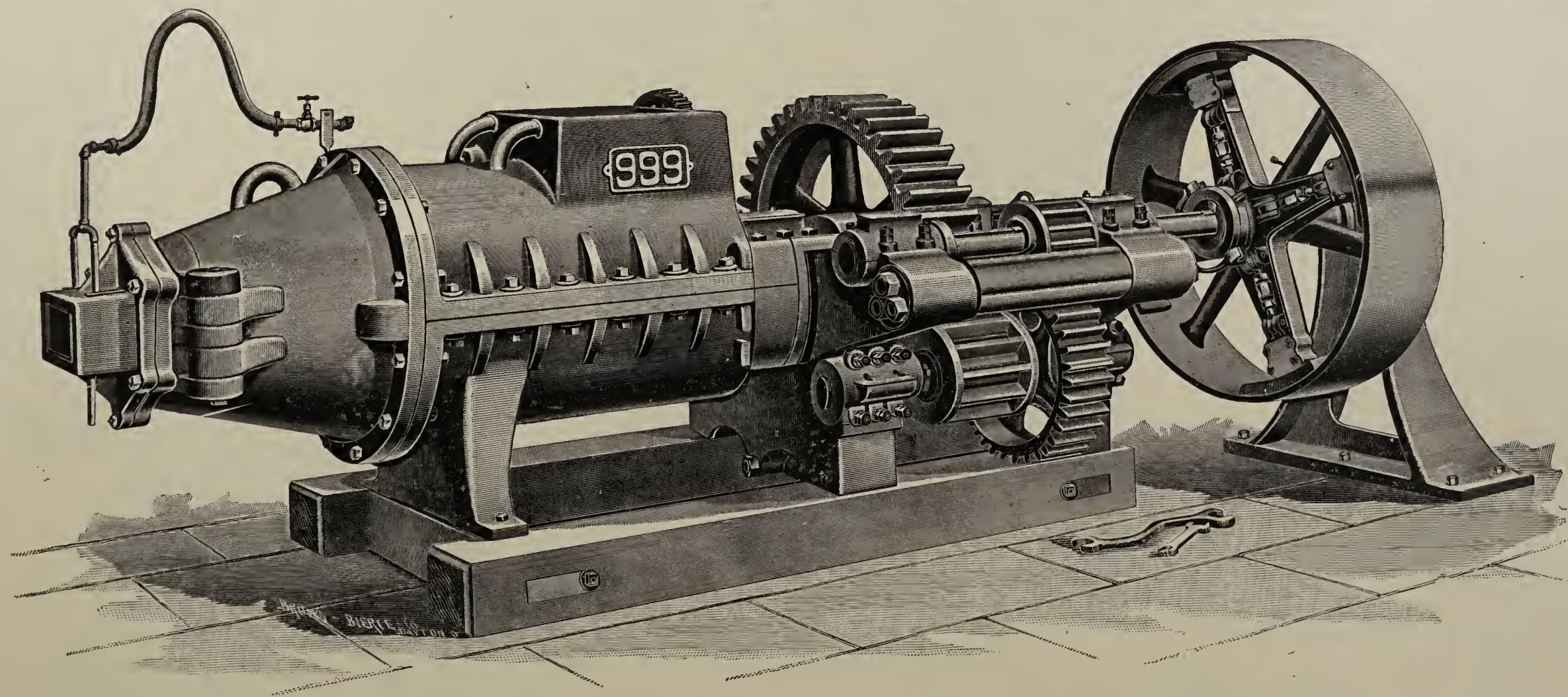
CROSS OIL FILTERS For use in the U. S. Armory at Springfield, Mass. Uncle Sam uses them in all branches of service. The same mail brought our 13th order from the Am. Tin Plate Co. and a re-order from the Lodge & Shipley Co., Cincinnati, for six more, given after making a test. These are endorsements worth having. We will send you one on approval and guarantee it to save 50 per cent of your oil bills.

Send for Catalogue 43.

The Burt Mfg. Co., AKRON, O. U. S. A.

Largest manufacturers of Oil Filters in the World.

Raymonds Large Capacity Brick Machine.



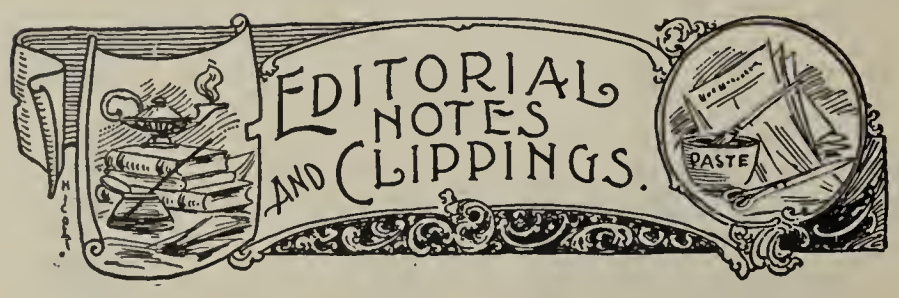
"Looks are nothing, behavior is all," is just as true of brick machines as of mortal clay. The above cut shows that our 999 machine is a good looker, and in operation it is even better than it looks. The very embodiment of strength, it is the machine for those who want to increase the capacity of their plant, while for the making of paving brick from tough shales it is par excellence. Its great power makes it possible to make good pavers from shales that can not be worked successfully in ordinary auger machines. This machine has many good points which we will gladly enumerate in detail to every brick maker who is interested. Address,

We also make a variety of superior Represses, Cutting Tables, Clay Grushers, Pug-Mills, Tempering Wheels and all kinds of Brick Yard Supplies.

Write for new Catalogue.

The C. W. Raymond Co.,

Dayton, Ohio, U. S. A.



A brickyard is wanted at Viola, Ill.

Richard Flint, of Ogden, Utah, will open a brickyard at Pocatella, Idaho.

George A. Wilson contemplates starting in the brick business at Manistee, Mich.

Ruthven, Iowa, wants a brick and tile factory. Anyone interested can address E. C. Rowell.

John M. Swain, formerly of South Bend, Ind., has established a brick plant at Galien, Mich.

North & Winston are negotiating for the erection of a large steam brick plant at West Huntsville, Ala.

John Berne has purchased the brick plant at Red Lodge, Mont., formerly owned by McCafferty Bros.

Joseph Schultz, an employe at Brush Bros.' brickyard, was quite seriously injured by a cave-in at the clay bank.

M. F. Rusfeldt has sold a half interest in brickyard near Duluth, Minn., to Wheeler & Benedict, at Mankato, Minn.

Charles Haines, of Dixfield, has leased the Leonard Bracket brickyard at Augusta, Me., and has same in full operation.

A. Babin & Co. is the name of a new firm that has purchased the brick plant of the late N. Blanchette at Beaumont, Tex.

The Union City (Tenn.) tile factory, which has been idle for some months, has started up under the management of M. E. Baty.

A large plant has been established at Monterey, Mexico, by Joaquin Maiz, for the manufacture of brick tiles for flooring, pottery, etc.

The Ohio Coal and Clay Company has been incorporated to manufacture brick at Washingtonville, O. They will also mine clay and coal.

Frank White is making a number of improvements in his brick plant at Albia, Ia., in order to meet the steadily increasing demand for his brick.

In renewing his subscription, W. C. Corbett, of Corvallis, Ore., writes that the brick trade in that section is better than for sometime, with prices firm.

James A. Stairs, E. B. Jackson, Howard Williams and James Boston have incorporated a company for the manufacture of brick at Mingo Junction, Ohio.

Lee Herman is making a number of improvements at his brickyards at Ponca City, O. T. Among other things he has put in a pressed brick machine.

J. Ryttenberg & Sons, Sumter, S. C., advise us that they are going to put in a steam dryer of 40,000 capacity, and desire to receive estimates from dryer firms.

A. J. Clark has made a number of improvements in his brick plant at Bloomfield, Ia., and will in the future manufacture pressed as well as common building brick.

Among the orders for American goods which are coming in from new enterprises in Cuba is an order for cross oil filters to equip a large, new electrical power-house in Havana.

W. S. Corbin, Johnstown, N. Y., advises us that he is in the market for a good second-hand dry press, four or five mold, dry pan of large capacity and elevator and screen for same.

A new concern has been organized at Fishkill-on-the-Hudson, N. Y., to control the brick business. It will be known as the Verplanck Brick Company. The capital stock is $48,000.

We are advised that Burkhard Bros., St. Joseph, Mich., are in the market for 1,000,000 pressed brick. They will be glad to have manufacturers quote lowest cash price for same f. o. b. cars, or boat, St. Joseph, stating the earliest date the brick can be shipped after order is given.

J. E. Lacher has started a new brickyard at Glendive, Mont. Mr. Lacher has had considerable experience in the brick business and there is no doubt as to the success of the enterprise.

The San Antonio Sewer Pipe and Manufacturing Company, San Antonio, Tex., advise us that they desire information in regard to using oil for burning sewer pipe in down draft kilns.

By an explosion of a blast in the fire clay mine of the Savage Brick Company, at Williams station, near Hyndman, Pa., recently, William Raley, a young miner, was instantly killed.

The Washington (D. C.) Hydraulic Brick Company's plant, near Long Bridge, Va., was completely destroyed by fire May 15, causing a loss of nearly $50,000. The plant will be rebuilt.

M. M. Hinneman's tile factory, at Lawrence, Ind., was completely destroyed by fire recently. The plant will be rebuilt and equipped with machinery from the shops of J. D. Fate & Co.

James M. Cameron, president of the Wakefield Fire Brick Works at North East, Md., died at his home May 27. Mr. Cameron was fifty-nine years old and leaves a widow and five grown children.

John Smith, of the firm of Peterson & Smith, brick manufacturers at Sioux City, Ia., fell from a load of hay and the wagon wheels passed over his neck, breaking it so that death resulted instantly. The deceased leaves a wife and an adopted daughter.

The extensive paving brick plant, at Beatrice, Neb., has been purchased by Robert Klose & Co., formerly of Hastings, Neb. The works, which have been idle for several years, have been entirely remodeled and equipped with improved machinery and appliances and will be run to full capacity.

Nicola Yalovia, an Italian, the foreman of the gang of men at work in the clay bank of the Los Angeles (Cal.) Brick Company, was caught in a cave-in at the bank and by the time the earth was removed he was dead. One other man was also caught, but he escaped with but few bruises.

Fred S. Naugle, superintendent of the Onandaga Vitrified Brick Company, at Warners, N. Y., in a recent letter says: "We are all in good health and working hard, with more business than we can take care of. Think we will have to elect a Democratic President and get rested up."

W. A. Morin, Albert Lea, Minn., in renewing his subscription to Clay-Worker, writes he has sold the entire real estate occupied by his brickyard for railroad terminals, reserving the machinery. He states that he is now looking for a location to install the machinery or a buyer for same.

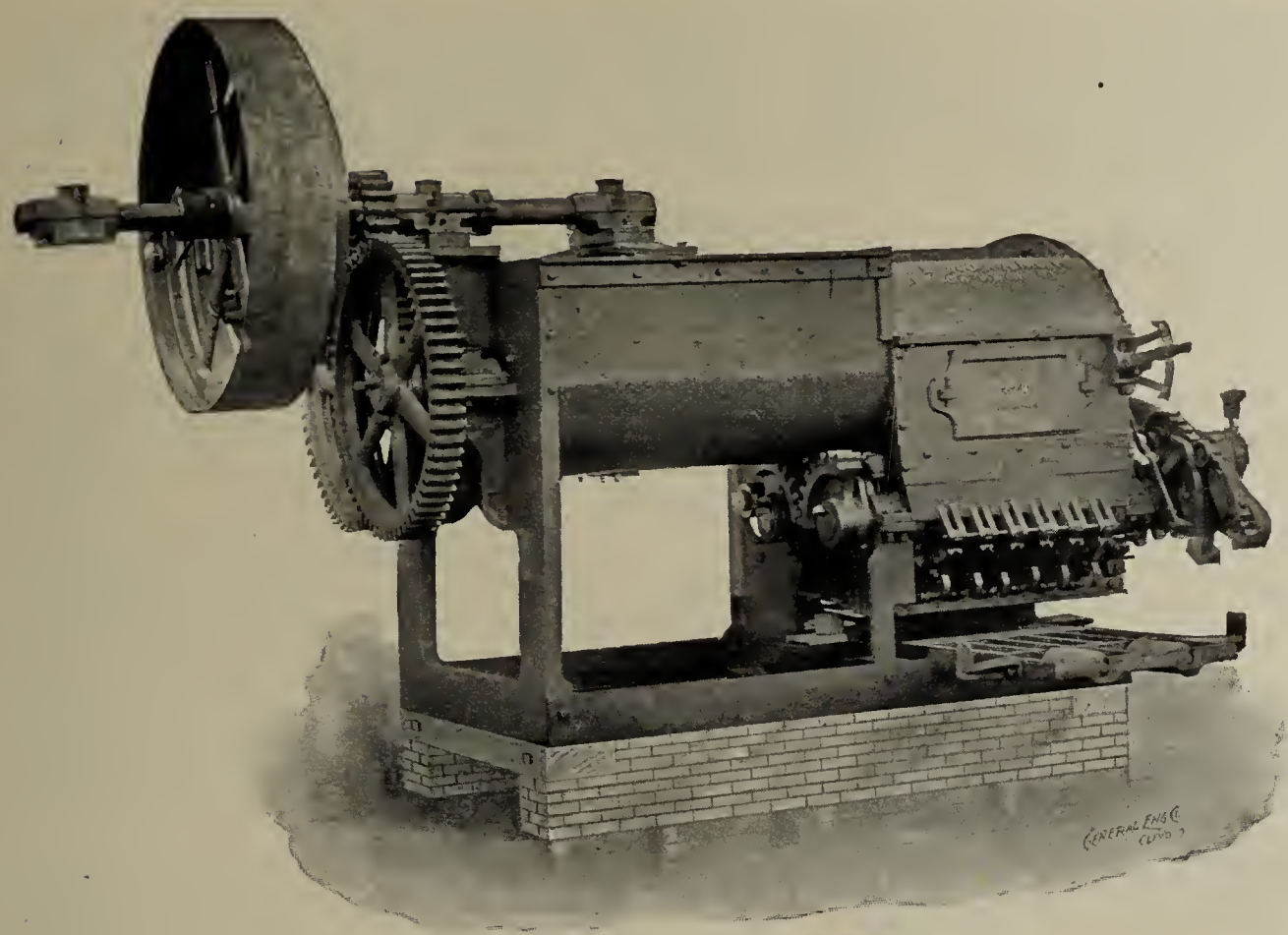
John Ittner, of York, Neb., contemplates establishing a brick plant at Sheridan, Wyo. He is having the clay tested and if the tests prove satisfactory, work on the new plant will begin at once. Mr. Ittner is now operating a very successful plant at York, but he thinks the Sheridan clay of a superior quality.

The brick and tile plant of Wagners & Bieglemeir, at Yankton, S. D., which has been idle for five years, was started recently with a full force of men. They have put in new machinery, which Mr. Wagners says, judging from orders already received, will be kept running at full capacity for several months to come.

Tile and brick yard owners needing conveying machinery should open correspondence with that thoroughly reliable house, the Borden & Selleck Company, 48 and 50 Lake street, Chicago. This company manufactures the Harrison Conveyor, and deals in every sort of conveying equipment needed. See their advertisement in another column.

R. G. Eisenhart, treasurer and general manager of the Horseheads Brick Company, Horseheads, N. Y., writes that

(CONTINUED ON PAGE 556)



Over 75 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

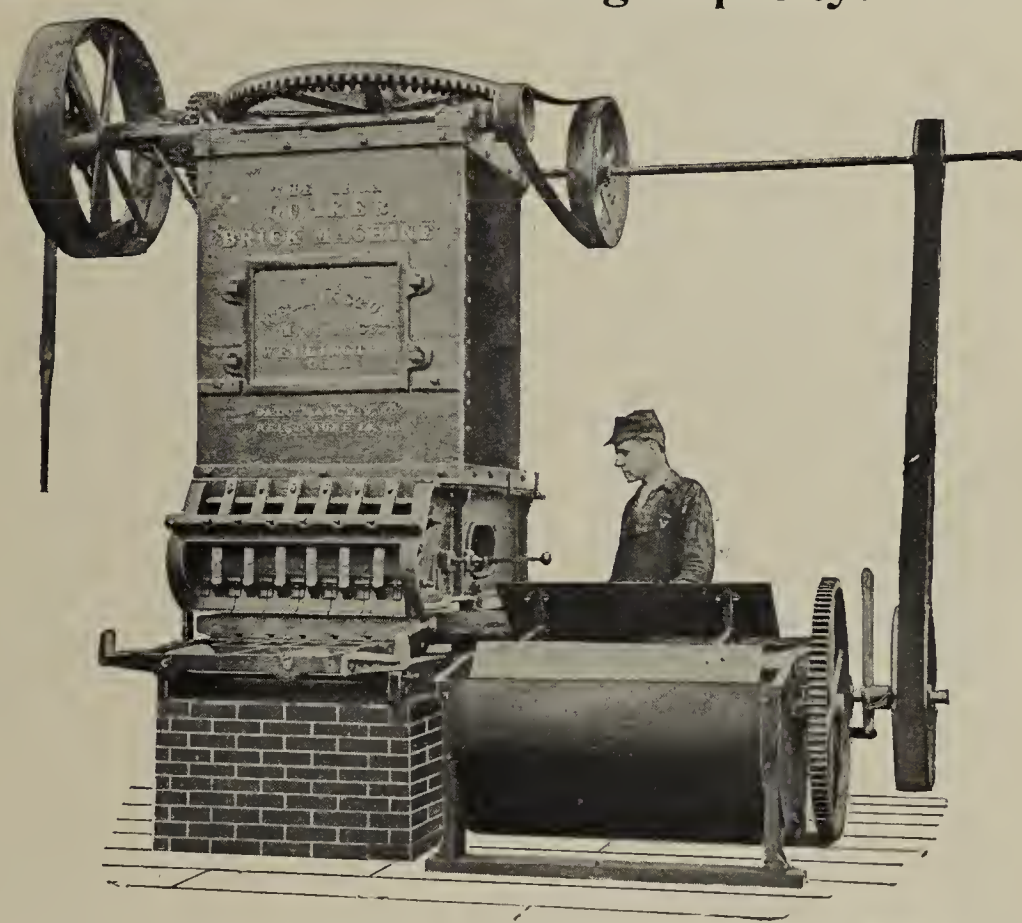
Long acknowledged the best for small and average sized yards.

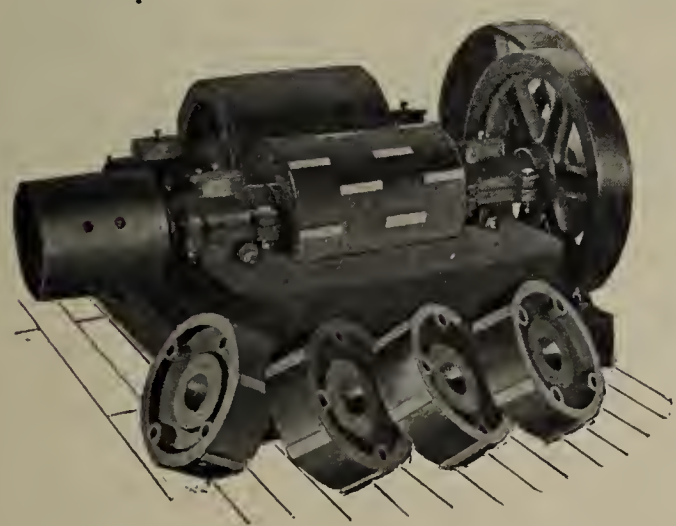
FOR 1900

We have added several new machines to our line.

Send for our 1900 Circulars.

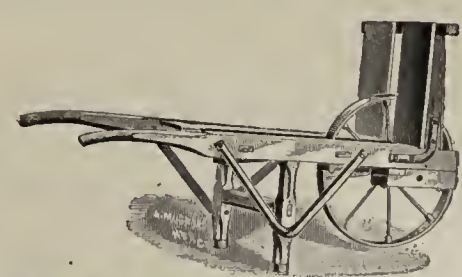
Our mould-sander is the best, simplest and cheapest.

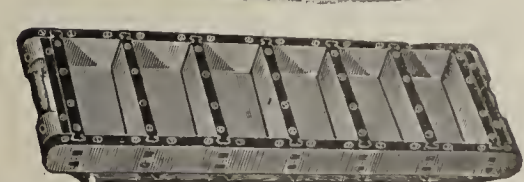




TWO Styles of Disintegrators, Solid rolls with inserted cutting bars and cutting roll made of hard sections.

MOULDS, TRUCKS, BARROWS, and all other Supplies.





Nothing runs easier than our BALL-BEARING BARROWS AND TRUCKS.

The WELLINGTON MACHINE CO.,

WELLINGTON, OHIO.

EDITORIAL NOTES AND CLIPPINGS—Continued.

they are exceedingly busy, though the demand for building material is not quite as strong as it was a year ago. He says they have no accumulation of stock and are perfectly contented.

Several cases of smallpox have broken out among the colored brickyard laborers at Walsh's brickyard, at Stockport, near Hudson, N. Y., and the yard has been quarantined by the State Board of Health.

T. B. Lemoine has purchased the tile factory and electric light plant of Mr. Randolph at Manson, Iowa. He will overhaul the plant, putting in new machinery, thus enabling him to more than double his output.

Ground has been broken at Tomahawk, Wis., for the erection of a large brickmaking plant, which will be under the management of L. R. Jacobs, an experienced brick man from Berlin, Wis. Machinery has been ordered from H. Brewer & Co., Tecumseh, Mich., and the completion of the plant will be pushed as rapidly as possible.

A communication received from A. L. Martin, manager of the Martin Brick Company, Minneapolis, reports business as very good, with prices from $8 to $10. The Martin company has recently rebuilt their plant, increasing the capacity of the plant to 6,000,000 brick yearly, having added a 100-horse power engine and Potts' disintegrator.

J. B. Patterson, secretary of the K. P. L. Furniture Manufacturing Company, Corry, Pa., writes that he is in the market for hollow building blocks in car load lots. He says that Corry is fast becoming a good market for building tile. The best of clay and shale is to be found in that locality and Mr. Patterson would like to see a good plant located there.

Under date of May 19, F. E. Swift, president of the Swift-Campbell Brick Company, Ottumwa, Ia., writes: "We are now running full blast. We are building four up-draft Swift coking table furnace kilns and will soon have brick on the market." Mr. Swift also says that slack coal coking table furnace kilns are "selling like hot cakes" since he has reduced the price on same.

The Western Brick Company's work, near Thirty-fifth and Bank streets, Louisville, Ky., caught fire at an early hour May 17, and was damaged to the extent of $14,000, on which they carried $10,000 insurance. The company had only been incorporated the day before, with $80,000 stock. The plant is the one formerly owned by Cook Nist, who sold his interest to the new corporation.

The plant of the Standard Brick Company, located at Brooklyn, O., was almost totally destroyed by fire on Sunday afternoon, May 28. The fire started in one of the kiln sheds and before it could be checked had spread to the dryer and other buildings. H. C. Bradley, of Cleveland, manager of the company, estimated the loss at $20,000, partly covered by insurance. The plant will be rebuilt.

In a recent letter the Stedman Foundry and Machine Works, of Aurora, Ill., report a splendid trade. They say they have all the orders booked for their Cyclone Pulverizer that they can well take care of. They have been running their works to full capacity steady now since September, 1899, part of the time twelve to fifteen hours a day, and the present indications are that they will keep this up for sometime to come.

George V. Triplett and others, of Owensboro, Ky., who are interested in extensive coal and clay deposits on the I. C. railroad, near that city, are preparing to establish a plant for the manufacture of buff and red front brick, vitrified pavers, fire brick, etc. They own 114 acres, with eighty feet of clay strata and coal, and the various samples of their clay products which have been manufactured and tested show a high quality.

The Queen City Brick and Tile Company, Cumberland, Md., have secured a contract for 1,250,000 brick to be used in the construction of the new buildings to be erected by the West Virginia Pulp and Paper Company, at Luke, Md. The contract is one of the largest ever booked by this company, and as the brick are to be delivered by August 1, it will keep the plant running night and day to fill this, in connection with their other orders.

The brick employes of Seattle, Wash., are agitating the formation of a union to protect them against Japanese labor, with which they say they cannot compete. On the other hand the brickyard owners claim they would rather not employ Japanese laborers, for while they can get them for less money, it takes two Japanese men to do the work of one American, and that they only employ the Japs because of their inability to get a sufficient number of the regular men at reasonable wages.

The Galesburg Paving Brick Company's plant, at Galesburg, Ill,. was completely destroyed by fire the evening of May 24, with the exception of the engine and boiler house, entailing a loss as nearly as can be estimated of $20,000, on which there was $12,000 insurance. Mr. Bloomfield, the manager of the company, who was in Chicago at the time of the fire, states that the plant will at once be rebuilt and this time the buildings will be of brick. This is the second time this plant has been damaged by fire.

Adolph Hilker, one of the oldest and most prominent citizens of Racine, Wis., and a member of the brick manufacturing firm of Hilker Bros., died at his home May 22. Mr. Hilker went to Racine in 1867 and has been engaged in the brick business ever since that time. He leaves eight children. A local paper commenting on his death, says: "In his death Racine has lost one of her most energetic business men and his presence will be sadly missed by those of our citizens with whom he came in daily contact."

Henry Boetcher, at Appleton, Wis., brought home a fourteen-year-old girl he had adopted, dressed her in male apparel, and compelled her to work in his brickyard with men and boys. Her sex remained undiscovered nearly a year. Some of the neighbors informed the humane society officers. They threatened to take the child away from Mr. Boetcher, but on his promise to dress her in girl's clothes and give her better treatment the society relented, but will in the future keep a close watch on both the man and girl.

The employes on the yard of E. A. Goodrich, South Fitchburg, Mass., went out on strike the first of the month, demanding either a reduction in their working hours or an increase in pay. The matter was amicably settled and the men went to work again after a couple of days' "rest." Mr. Goodrich said that the day of the strike was the first fair day during a working season that he had failed to produce brick at this yard for nearly a half century. Mr. Goodrich also operates a yard a short distance from South Fitchburg, where everything has been running smoothly with no indication of labor troubles.

In a recent communication R. H. Dickinson writes that he and his brother, K. D. Dickinson, have formed a partnership, doing business in the firm name of Dickinson Bros. They have purchased a large site in West Virginia, on which they will erect a large brick plant, equipping it with machinery from the shops of the Henry Martin Brick Machine Manufacturing Company, Lancaster, Pa. They will manufacture fire brick as well as common red and pressed building brick. Mr. Dickinson says they expect to have a new postoffice close to the location of the plant, but for the present their headquarters will be Mt. Hope, W. Va.

HERE IS A SNAP.

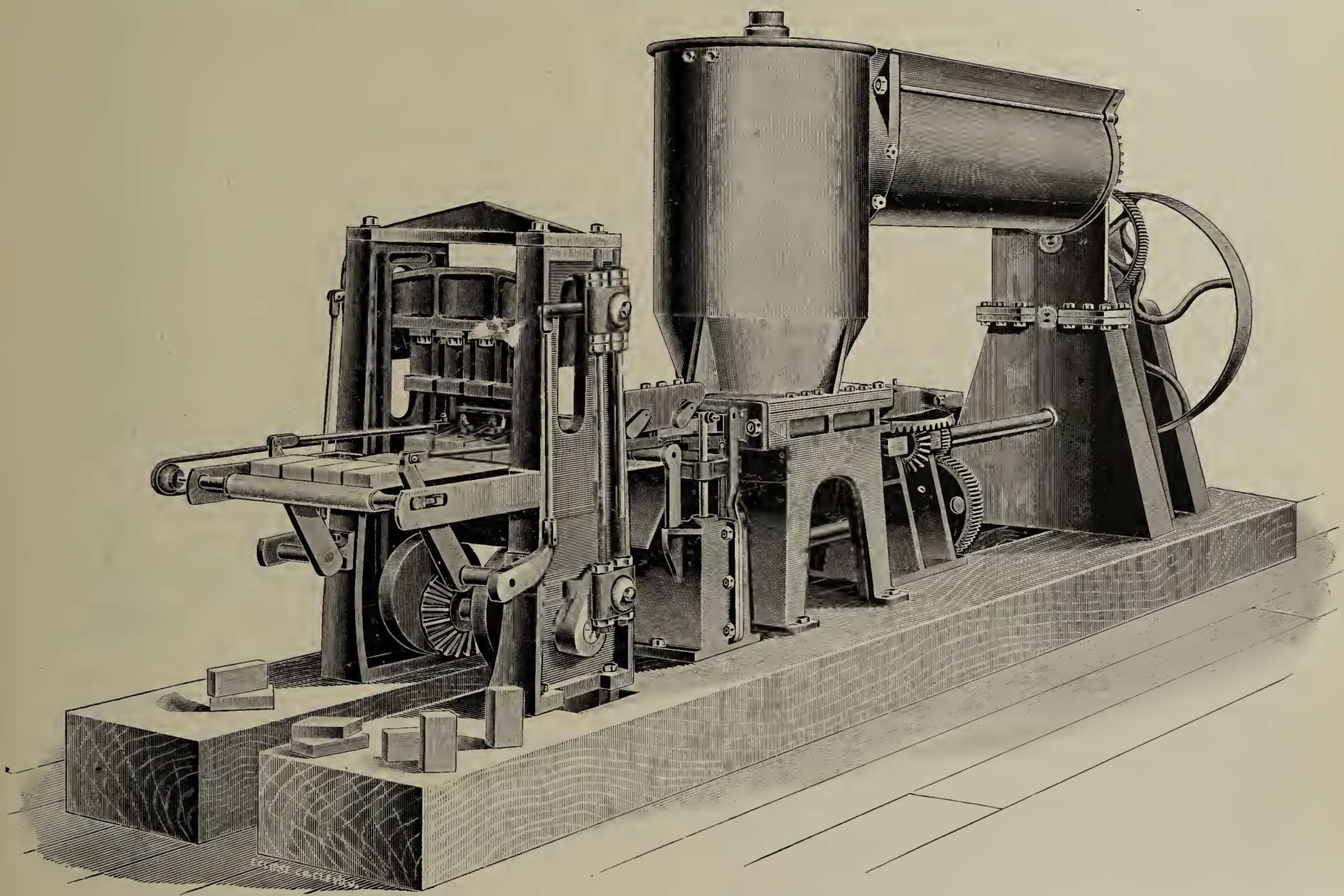
A $25,000 Brick and Tile works for $7,500. Clay of fine quality, vitrifies. Machinery first-class and in good condition. Kilns alone worth the money. Will stand careful investigation. For particulars address IOWA, care Clay-Worker.
6 1 c

The DAWN OF THE NINETEENTH CENTURY,

"PROGRESS and PERFECTION."

The DICTATOR BRICK MACHINE will take the Clay or Shale as it comes from the bank or Dry Pan and automatically produce perfect repressed brick.

NO LAMINATION.



DICTATOR BRICK MACHINE. Capacity 40,000 Perfect Repressed Brick per day.

The Machine for making Paving Brick,

—STRONG, DURABLE, SIMPLE.

The Battenfeld Mfg. Co.,

Write for Catalogue. *922 Garfield Bldg, CLEVELAND, OHIO.*

A QUEER FIND IN A MAINE FOREST.

"AND, DEPARTING, leave behind us footprints on the sands of time" sang the poet. Every good man, and, indeed, every man, good or bad, is bound to do that. It is something in the very nature of their existence which cannot be avoided. It is only the brickmaker and now and then another manufacturer who does more. They may have been either good or bad, but they left their footprints; some square-toed, broad-gaited, masculine, and straight away, others pigeon-toed, wabble-gaited, weak and vacillating, and the footprints left by each tells the history and the character of the man, who, departed, taking with him his feet and everything else, except his footprints. Brickmakers leave now and then a brick bat pile or a brick machine which refuses to decay. These live longer than the footprints and often serve to excite curiosity and create mystery in succeeding generations, but they speak little of the character of the man who left them and seem to serve only as monuments emphasizing the wail of dying and dead humanity, "how soon are we forgotten."

I am led to speak thus by thought of a strange machine which I saw a few days ago standing in the midst of a boggy clearing in the heart of the Maine backwoods. I saw it first ten years ago, as I passed, one cold moonlit night, on my way into the logging camps behind Mount Katahden, eighty miles away. It looked then like a windlass used in pressing hay, but there were no meadows anywhere about, and I thought then that it might have been the windlass often used by log drivers in warping logs against head winds across the lakes. I saw it again five years ago. The Bangor & Avostook Railroad was being pushed through sixty-five miles of unbroken forest, from Brownville (of slate fame) to Houlton. Midway between the two towns ran a narrow highway and a small clearing, with some appletrees, a log hut and a board barn, deserted, and the windlass broke the monotony of forest scenery. The highway was the old stage road from Bangor to Patten and Houlton. It ran east and west. The railroad crossed it running north and south. While I lingered there a town began to grow up at the crossing. A small hotel sprang into existence and a store popped up on the opposite side of the street. I was out for a rest and lingered to watch the development of a new community. In rambling through the clearing I came upon a heap of crumbled brick and found, near the shore of a brook which swarmed with trout, hid in heavy woods-growth, a deposit of gray clay. I found where somebody, generations before, had dug the clay, and then I found the remains of an old pug mill. The bits of burnt brick found showed that a skilled moulder had worked there, but where he worked and who he was, or where his brick went to nobody could tell me. Sherman village, five miles away, on the southwest, had forgotten him. Patten village, eight miles east, where hundreds of woodsmen bid adieu annually to civilization for the winter, never had heard of brick being made at that crossing. But brick were in demand there now, and encouraged by me, Mr. Leen, the owner of the land, and the hotel keeper at the crossing, went to manufacturing brick. The yard was built quite near to the old windlass, but it was not in the way, and no one bothered it. The new brickyard was a success and, for two years, it barely kept up with the demand. Then the market became glutted and the yard has lain idle. I was there the other day and looked it over. I saw the strong new Hobbs machine we had placed there growing rotten and seamy and heaving out of shape, and the grass and new trees were high, growing on the yard where Mike Leen made brick. I went over to take a look at the windlass. "What was such a queer high windlass needed for," I asked. The old resident answered, "I don't know as it is a windlass, and nobody knows what it is." So I looked at it. It was solidly built, of oak, and the red paint spread upon it by its maker was still comparatively bright. It had a base, or body frame, four feet high and six feet square, within which was set a wheel of wood, bound with iron, and through which ran a cylinder or shaft of hard wood. A sweep of hard wood ten feet long turned the shaft. "Is it a hay press?" I asked. "Looks more like a brick press," said the farmer, who had never seen one. Still laughing at the foolish notion of the farmer, I caught hold of a knob on the wheel and lifted. To my surprise a lid flew back and disclosed a chamber partly filled with clay. I dug it out and found the chamber was about the size of two brick, that two brick, laid in flat, would leave barely room for the iron lid to close. It was a brick press after all. There were four or five of these chambers in the wheel, and apparently the brick were put in when damp to straighten them rather than press them smooth, as no sign of repressed brick can be found there. As the wheel revolved, four legs, supporting the wheel within the frame, turned with it. They ran on castors of wood in a circular track, and as the legs supporting the wheel reached the top of the incline it brought the pressure against the lid of the chamber, which, when it reached such a point, passed under and was laid down firmly by a heavy iron-bound oak cross bar. As the legs jumped down the short side of the elevation a plunger beneath threw the pressed brick out upon the table. The machine was undoubtedly the invention of the man who made brick then, and shows that while he didn't know exactly how to prepare his clay in order that it might make straight brick at the first moulding, he still had the inventive genius that follows the brickmaking industry and he made his brick straight afterward. But why such genius should waste itself in a desolate spot in the wilderness is another of the mysteries. He builded well, for the strange machine is stronger to-day than the new one placed there by Mike Leen.

"The evil that men do lives after them, but the good too often is buried with them." This is an exception to that rule. The evil which that forgotten toiler in the mud did is buried with him, else by that evil we could dispel the mystery concerning him, but the good that he did—the good machine which he builded out of his genius and by his own hands—lives after him. It lives only as an interrogation point in the bog.

Who was this man?
From where came he?
Whither has he gone?
His brick, where are they?
Why did he toil in this lonely place?

The scream of the locomotive, the roar of passing trains, the noise of busy progress and the voices of many men turning the wilderness into a lively town give back no answer. Soon they will demolish even the interrogation point itself and they, in turn, passing away, will leave not even an echo on the shores of time.

How soon are we forgotten.

BRIAN J. DUNN.

AN ILL-ADVISED VENTURE.

REUBEN—Old 'Squire Tubbs got let down in fine shape a couple of months ago.

SILAS—How so?

REUBEN—Aw! he gave a feller a dollar and seventy-five cents fer a Mexican dollar to use fer campaign purposes, and now he's found out that imperialism is goin' to be the main issue!—*Puck.*

A GOOD STORY ON A POPULAR MILWAUKEE BRICK-MAKER.

—Long on Brick Lore, But Short on Cowology.—

John F. Burnham, of the Burnham Brick Company, is long on building information and were it necessary could probably tell how to make bricks without straw, but he has lived in the city all his life, and is very short on some points in natural history, which in the country are but A B C to the smallest boy.

He went into the country the other day and bought a cow. J. P. Murphy, vice president of the Milwaukee bank, also wanted a cow. He learned of the mission of his friend Burnham and commissioned the latter to also buy a cow for him.

Mr. Burnham found a farmer with Jerseys to sell, picked out what he thought a likely looking animal and purchased her for himself. Then he looked over the herd and got one for his friend Murphy, devoting more time and care to this choice than he had given to the animal he had picked out for himself. He finally selected one which, according to the farmer, was in every respect young, sound and healthy, and was just about to close the bargain when he remembered something.

Mr. Burnham has some little knowledge of horses and knew that wise horsemen always looked at a horse's teeth to determine its age. Catching the cow firmly by the muzzle, he drew back its upper lip and was astonished to find that it had not a tooth in its upper jaw.

"I thought you said this was a young cow?" he said, angrily. "You can't fool me that way. She hasn't got a tooth in her upper jaw. You can't pass off any old cow on me that way. I'm no sucker and I won't do any business with a man that attempts to deceive me that way. You can keep your cow."

When Mr. Burnham told Mr. Murphy the reason he had not purchased a cow for him was because the farmer had attempted to pass off on him an old cow without any teeth in her upper jaw the banker laughed immoderately. "When I lived on a farm," he said, "the cows never did have any teeth in their upper jaw. At least I never heard of one that had, and I presume they are built that way yet," and then Mr. Burnham agreed that the joke was on him and acknowledged it handsomely after the customary manner.

A NEW KIND OF CHIMNEY BRICK.

A German system of chimney building has been recently introduced into this country, says the Boston Transcript. These chimneys are of round construction, being built of radially molded bricks, perforated. The perforations serve as a dead air space, preventing radiation through the walls, resulting in better average draft and causing same to be less affected by atmospheric changes. A sufficient number of sizes and shapes of these are carried in stock to enable the builder to produce a circle of any diameter and thus to build a chimney of any size, and to conform to the diminishing radius as the height increases. These bricks are much larger than the common form, and the joints are correspondingly fewer. No attempt is made to make the perforations register. They serve simply to give the mortar a better hold and to furnish dead air space which retard the radiation. It is possible, too, that they serve a useful purpose in the uniform burning of the brick. At all events, brick so perforated crushed at 5,035 pounds per square inch, against 4,987 pounds for solid brick made out of the same material. The perforations increase the adhesion of the joint about threefold.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

A BIG BLUFF? OH! NO.

We claim the Berg Press does infringe our Patents. In that Press are some devices secured to us as new and original, by our Letters Patent. This is an admitted fact. Those claims in our Patents must be declared "VOID," else the Makers and Users of the Berg Press must be deemed guilty of infringement.

Now the fact is we have brought suit against the Makers of the Berg Press, that is **No Bluff.** The evidence establishing our "Prima facie case" has already been taken, and that is **No Bluff.**

When the Courts have decided our Patents to be "GOOD" and the Berg Press an "infringement," as we honestly believe they will, the brickmaker who has been talked into buying the Berg Pitman-Lever Press will then know full well that we made **No Bluff.**

If each purchaser withholds payment until this suit is decided, or takes a bond for the money, a Bond that is good, sure and collectible, he will make no mistake. That will be **A Good Bluff,** one which the Makers and Sellers may not find agreeable "to call."

We have started out to protect what we believe to be our just and equitable rights, and we propose to fight it out on these lines if it takes "ALL WINTER" and that is **No Bluff.**

CHISHOLM, BOYD & WHITE CO.,
CHICAGO, ILL.

June 1st, 1900.

WRITTEN FOR THE CLAY-WORKER.

PACIFIC COAST NEWS.

SUPERINTENDENT GARDNER, of the Napa, Cal., State Hospital, has received from the managers of the Agnews Hospital a letter inquiring if the Napa Hospital could make 125,000 bricks to build a new structure at Agnews, Cal. Dr. Gardner has replied that he can furnish the bricks and will fix a price. Agnews has been paying $6 a thousand for bricks, but the dealers have raised the price to $9.

An extensive bank of fine potter clay has been discovered near Darrington, Wash. The clay deposit averages six feet in depth, is 600 acres in area, and within a half mile of the Darrington extension of the S. & I. Railroad. Samples of the clay were recently taken to Everett, where they were molded and placed in an assaying furnace and subjecte dto a heat of 2,000 degrees. Upon being taken out it was found that the clay stood the test finely. Samples of the clay are now on the way East and, if favorable reports are received, a first-class pottery, brick and sewer pipe factory will be erected at Everett. Among those interested in the property are Sam Grafton, A. D. Warner, J. N. Walker and W. R. Stockbridge. These gentlemen have an option on the entire clay bed.

A pottery and brick and tile plant will be erected in South Colby, Wash., some time this month.

Mr. L. S. Guice has established a brickyard at Hermosillo, and another near Batamotal, Mexico, to supply the demand for building material in Sonora. Brick plants with modern machinery are going up all over the Republic.

R. M. Dunn, of Portland, Ore., has put in a brick plant at Sumpter, Ore., and has commenced the manufacture of brick.

The firm of Hannah, Laird & Johnson, brickmakers at Vancouver, B. C., has been dissolved. Messrs. Hannah and Johnston will continue the business.

Mr. Gonzalo Siller is preparing to establish a brick plant at Gomez Palacio, Durango, five miles north of Torreon, Mexico. He has asked the State for exemption from taxes for twenty years, agreeing to invest $100,000 in the enterprise and to install the most modern machinery.

A. Day & Co. have started a brick manufacturing plant at Kanosh, Utah.

The Seattle Brick and Tile Company reports that it is doing a large business in Seattle, Wash., and has recently added a fine new dry kiln to its plant. There is a large amount of building going on in that section.

J. S. Morgan has sold his brickyard at Albany, Ore., to Wilson & Kitchen, of that city.

Since the announcement of the discovery of kaolin beds, near Eatonville, on the Nisqually river, Washington, some time ago, the parties interested in the discovery have been at work bringing the find to the attention of capitalists and experienced workers in kaolin, with the result that a company is now being formed to operate on a large scale. Charles T. Peterson, of Tacoma, Wash., has purchased the claim located by George Kreger, and had samples of the clay examined by kaolin workers from East Liverpool, O., and other places, who prononunce it of first quality. The deposit is in a layer eight feet thick and extends along the river bank, cropping out for about 3,000 feet, running back into the hills. It is easy of access, and extensive enough to make dishes for all the world for years to come. Parties who are now interested in the enterprise with Mr. Peterson propose to go into the business of manufacturing dishes on a large scale, for which all the conditions are favorable. Not only will all the common kinds of ware be made, but several specialties will also be made, for which they will have a large market. The works will probably be located in the suburbs of Tacoma, and the clay brought in on the cars as soon as either one of the three railroads now building toward Eatonville is completed to the vicinity of the beds. Details of the arrangements are not yet complete, but negotiations have progressed so far that the value of the deposit has been brought prominently to the notice of several capitalists who are practical manufacturers, and the success of the enterprise is assured.

Work has been commenced on the new brickyard at Waitsburg, Wash. A test kiln of 100,000 will be burned first, and if the clay proves to be satisfactory, a kiln of 300,000 will be made. C. W. McCoy is the leading spirit in the enterprise.

William Russell, of Gold Hill, Ore., the well-known brickmaker of that section, has formed a partnership with Kellogg & Darling for making brick at Jacksonville, Ore. Stickle & Statenberg are also clearing ground for a brickyard there.

Preparations have been made for burning a kiln of 200,000 brick at the Marcy yard, Forsyth, Mont.

J. H. Miller & Sons, of New Whatcom, Wash., expect to manufacture over two millions of brick during the summer. They employ twenty men and are manufacturing brick at the rate of 25,000 per day.

Garrett Bros., of North Yakima, Wash., have added to their brickmaking plant a new automatic brick press with a capacity of 20,000 brick per day. Later in the season they will also put in a repress machine for the manufacture of pressed brick.

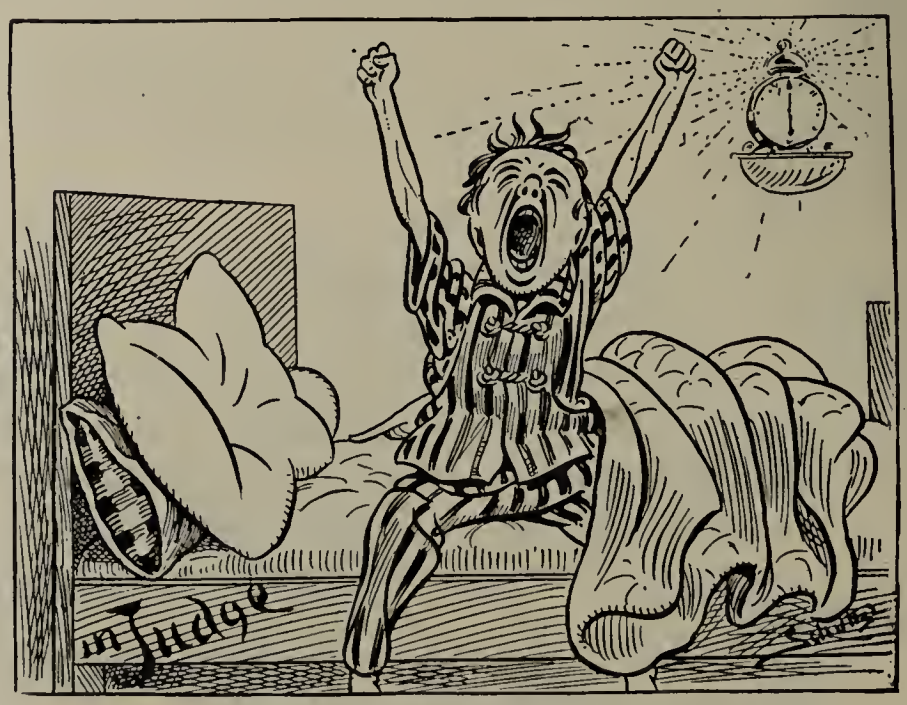
Long & Pickens have put in machinery and have commenced the manufacture of brick at their yard on Central avenue, Great Falls, Mont.

W. R. Shimp, of Ontario, Ore., started a large brickyard near Ontario last month and is turning out a large quantity of brick.

John Lapointe and John Croft have started a brickyard at Nelson, B. C. They have secured permission from the City Council to cut away the clay bank on Josephine street, between Front street and the railroad track. It is estimated that this bank will yield ten million brick.

The Pacific Art Manufacturing Company, which was recently organized in Los Angeles, Cal., to make vases, tiles, etc., in Southern California, has elected the following officers: Griffith J. Griffith, president; Major George Easton, vice president, and J. C. Marquardt, secretary.

San Francisco, Cal. SUNSET.

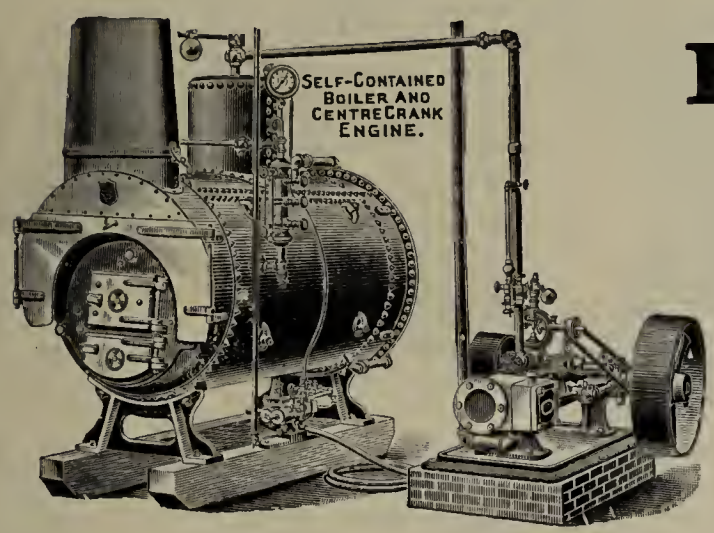


AN OPTICAL DELUSION.

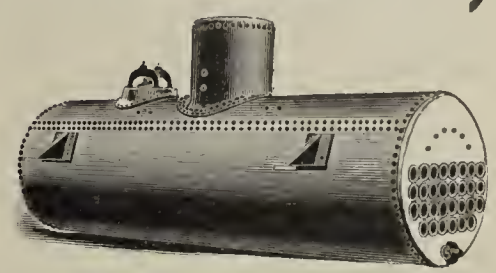
This young man looks like a very muscular gladiator. Note the wonderful development of his arms.

But it was only the pillow.

THE MURRAY IRON WORKS COMPANY,



Burlington, Iowa,

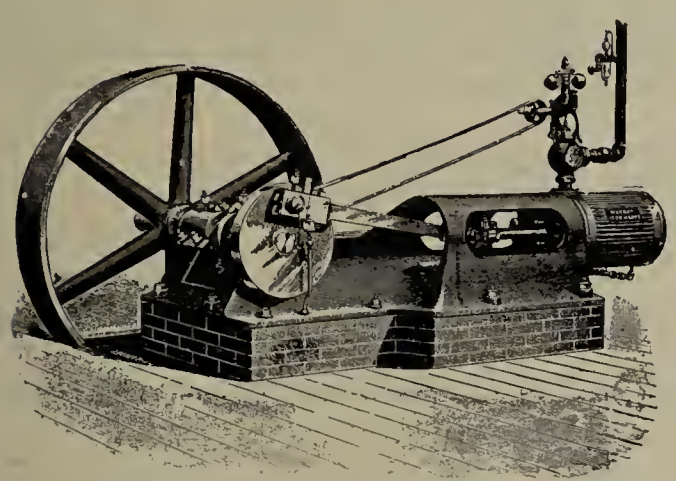


BUILDERS OF

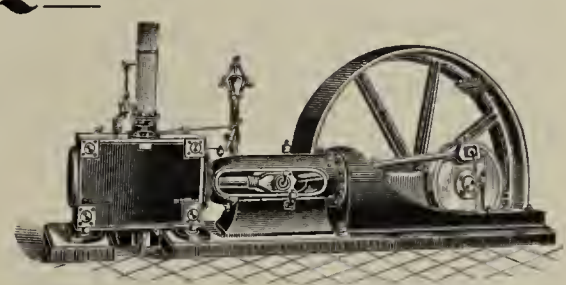
Corliss and Slide Valve ENGINES and BOILERS

For all Pressures.

Send for Catalogue No. 40.



OUR SHOPS are Fully Equipped With all the modern tools and appliances; we employ 400 men, carry thousands of tons of materials and can execute your orders promptly and at the lowest prices.



The PROGRESS BRICK PRESS.

THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick. Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE ON APPLICATION.

ORNAMENTAL BRICK.

We carry a full line of shapes in red color, and will be pleased to forward our Brick Catalogue on application. Liberal discount to dealers.

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. *ST. LOUIS, MO.*

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

FOR SALE—At a bargain—One 4-mold Boyd press; one 42-in. Fernholtz clay pulverizer; both in good condition. Address WILLIAM F. SCOTT, 1214 Poplar St., St. Louis, Mo. 6 1 1

WANTED—Situation as superintendent, by a practical clay man; front brick (dry press or stiff mud), fire brick, fire proofing, sewer pipe, common brick; up-and-down draft kilns. Address
6 1 d WESTERN, care Clay-Worker.

WANTED—A stiff-mud second-hand brick machine, capacity 12,000 to 20,000 per day; state condition, weight, make and price f. o. b. East St. Louis.
T. P. PLUMRIDGE,
1112 Chemical Building, St. Louis, Mo.
6 1 k

WANTED—A good competent man to take the superintendency of a first-class brick and tile yard in Iowa; one who understands burning thoroughly and has had some experience in managing men preferred; good salary to the right man who is not afraid of work. Address IOWA,
6 1 d Care Clay-Worker.

WANTED—A man with practical experience in the manufacture of all sorts of fire brick, sewer pipe connections, traps, access pieces, etc.; also a thorough knowledge of the Dunnachie patent Regenerative Gas Kilns, desires a permanent situation; can give good references. Address GLENBOIG,
6 tf r Care Clay-Worker.

FOR SALE—Cheap, complete brick-drying apparatus; one Sturtevant fan, 96x30 in.; one Atlas engine, 10x12; 8 sections of pipe, 12,000 to 13,000 feet, in first-class running order; has been used very little. This plant has been drying from 50,000 to 60,000, but has changed system of drying owing to conditions. Also a lot of relaying 16 and 20-in. rail. Address STURTEVANT,
6 1 d. Care Clay-Worker.

EXCURSION TO ELWOOD VIA PENNSYLVANIA LINES.

Tuesday, June 26, and Friday, June 29, for State Encampment Sons of Veterans, low-rate non-transferable excursion tickets will be sold via Pennsylvania lines to Elwood, valid for return trip until Saturday, June 30. 6 1 1

The Belt for the Brick Yard

Is the one that is not impaired in length or kind of service, when subjected to excessive weather, moisture or dust conditions. There is only one constructed to withstand these without injury, and it is

LEVIATHAN BELTING.

Our customers bear us out in this, and a trial order will demonstrate it to you.

MAIN BELTING COMPANY,

1221-41 Carpenter St., Philadelphia, Pa.

55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.

Write for Samples and Price Lists.

Anglo-American Pottery.

Old English China with American Views.

A MANUAL FOR COLLECTORS, BY

DR. EDWIN ATLEE BARBER, A. M., Ph. D.

Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

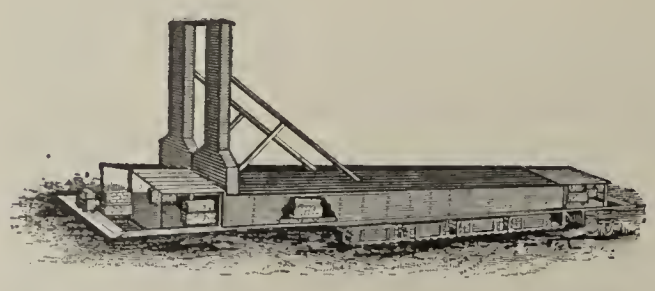
The price is $1.60 per copy, postage prepaid.

T. A. RANDALL & CO.,
The Clay-Worker.
INDIANAPOLIS, IND.

A. F. BARRON,

Patentee and Builder of the

CHICAGO IRON CLAD and BARRON'S TENDER CLAY DRYERS.



These are the gradual outgrowth of a correct principle patented 28 years ago. Every year since that date has witnessed improvements that has kept this system beyond the reach of competition and we now can build Dryers to dry clay products of every grade, even if the clay is of a tender nature. The original principle is still retained. Crude methods of application displaced by money saving devices in steam fitting and construction—enabling patrons to turn out clay products of highest grade in strength and color and at a great saving in expenditure of fuel. In seeking information mention the peculiar nature of the clay, process of manufacture, etc. Address,

A. F. BARRON,

Temple Court Building. CHICAGO, ILL.

For Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan Bark, Cinders, Ores, Sawdust, Lime, Cement, etc. Also continuous Pan Conveyors.

Iowa Pipe and Tile Co , Des Moines, Iowa.

Borden & Selleck Co , Chicago:

Gentlemen—We have used the Harrison Conveyor for the past two years. It takes about ninety tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours truly, IOWA PIPE & TILE CO.

BORDEN & SELLECK CO., Mfrs. and Sole Agents, **48 & 50 Lake St., Chicago.**

Send for Illustrated Catalogue.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS Agent and Patentee, **161 Grand Street, Rahway, N. J.**

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.

For **uniformity** in **burning, hardness** of **ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump,** and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

FOR SALE—One E. M. Freese, Steam Mammoth Brick Machine, with cutting table complete. Capacity, 60,000.
CHARLES F. SHUSTER,
5 4 c Norwood, Pa.

ENAMELER superintendent wants position; practical proof of ability given to firms intending business.
CLARENDON, care Clay-Worker.
6 1 c

WANTED—100 brick cars, suitable for pallett system; also 250 double-deck cars, to hold not less than 500 green brick, track, gauge 24. Box 230, May's Landing. N. J.
6 1 c m

WANTED—Party or parties with experience to furnish additional capital and take active part in operating terra cotta plant, already constructed and equipped with kilns, machinery, etc.; plant is well located, between Philadelphia and Trenton, on Delaware River & Pennsylvania Railroad; plenty of first-class terra cotta clay in vicinity. Address
6 1 c F. G. GREEN, Burlington, N. J.

FOR SALE—A whole or a controlling interest in a face brick plant, situated on a main-line railroad in southern Ohio. There goes with the property over 250 acres of coal and clay land. The clay and coal are above factory level and are assembled down hill. A horse can be driven anywhere in the mines. The clays are developed and suitable without mixing to make the finest mottled flashed brick in the world, and a successful manufacturer will associate himself with the enterprise. There is a market for the product at remunerative margins from Maine to Minnesota and from Canada to the Gulf. Address all communications to J. C. B.,
Care Clay-Worker.
6 1 d m

WANTED TO PURCHASE.

Narrow gage saddle tank locomotive, Porter or Baldwin make preferred, also one steam shovel. Please furnish full description. Address LOCOMOTIVE,
5 3 6 1603 Monadnock Block, Chicago.

PERSONAL.

We seek the address of M. J. Carlton, formerly employed as brick works superintendent by The Weber Brick Co., of New Jersey, and by Mr. John Miller, of Washington, D. C.
CHAMBERS BROS. CO.,
52d St., below Lancaster ave.,
5 1 f Philadelphia, Pa.

A COMPLETE BRICK PLANT FOR SALE AT A BARGAIN.

EVERYTHING NEW.

Only brick plant located in Warren, O., a town of ten thousand inhabitants. Having bought same at assignee's sale, must be disposed of at once.
THE HORTON MFG. COMPANY,
2 tf 1 Painesville, O.

CHEAP TICKETS TO CHARLESTON, S. C.

They will be sold July 3, 5, 6 and 8, via Pennsylvania lines, account meeting of National Educational Association. Anybody may take advantage of the special rate and enjoy a vacation outing. Information about variable routes, stop-over privileges, through time and other details will be furnished free by passenger and ticket agents of the Pennsylvania lines. Apply to the nearest one.
6 1 l

FOR SALE — One 42-inch Steadman mill, used only a few days; good as new; will be sold cheap. C. and A. POTTS & Co.,
4 2 1 Indianapolis, Ind.

FOR SALE — One No. 7 Penfield plunger mill. One Penfield elevator. One Morenci, Mich., cutting table. Address
4 3 c BARRED, care Clay-Worker.

WANTED — A first-class man as superintendent of a sewer pipe factory. State experience, salary expected and for whom you have worked. Address
4 3 d J. T. S., care Clay-Worker.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — Brickyard fully equipped, central Iowa. Will sell whole or an interest to practical man. Cost $25,000. Less than half will buy it. Good reasons. Address "PAVING BRICK,"
4 3 c m care City Bank, Boone, Ia.

FOR SALE — Brick machinery.
We buy and have for sale all kinds of machinery; good second-hand engines, boilers, brick machines, crushers, pugs, presses, dryers, cars, rail, etc.
We have several yards in operation for sale. We equip entire new yards.
Write us what you want. Address
3 tf d C. W., care Clay-Worker.

FOR SALE — Two brickyards in first-class shape, pallet system. One three-machine yard, capacity five to six millions, sidings from two railroads direct to shed. One two-machine yard, capacity two and a half to three millions, siding from railroad direct to shed. Both yards load direct from kiln to cars. These yards located so they cover the markets of Massachusetts, Rhode Island and Eastern Connecticut, and are equipped ready to operate. MARCY & GARDNER,
4 3 d Palmer, Mass.

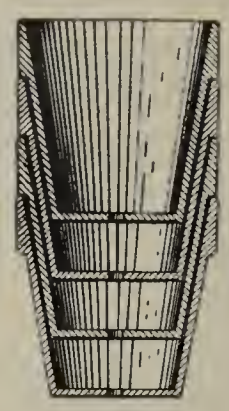
WANTED — A situation as superintendent or foreman of paving brick department in a clay manufactory. Have had years of experience, and can successfully manufacture blue vitrified paving brick, such as have proven so satisfactory in England. They are generally considered the most durable of all paving brick, and can be made from shale or clay used in this country in the manufacture of sewer pipe, etc. These brick can be made at small cost—little, if any, more than common builders. I will guarantee this and to produce paving brick the equal of any made in this country. I know whereof I speak, and do not propose to indulge in any experimental work. Can give the best of references. Address "BLUE PAVER," care Clay-Worker. 3-1-r

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.
PROCESS—Changing buff brick to blue-gray: the same mixture; no spraying.
SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH.
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 4 tf d

FOR SALE.

One Iron Standard steam power machine, with pug mill attached.
One Fletcher & Thomas pug mill.
One Anderson Brick Machine, with 12-foot pug mill.
Two reliable hand brick machines.
One new Brewer Crusher.
One second-hand Brewer Crusher.
One Carnell repress.
One Penfield No. 7 brick and tile machine.
One Penfield soft mud machine.
One Penfield double plunger brick machine.
One Freese board delivery cut-off table.
One Fate-Gunsaulus rotary table.
One forty-horse power boiler and engine.
One Monarch Machine, used two summer seasons; in excellent repair.
THE HORTON MFG. CO.,
4 tf d Painesville, O.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,

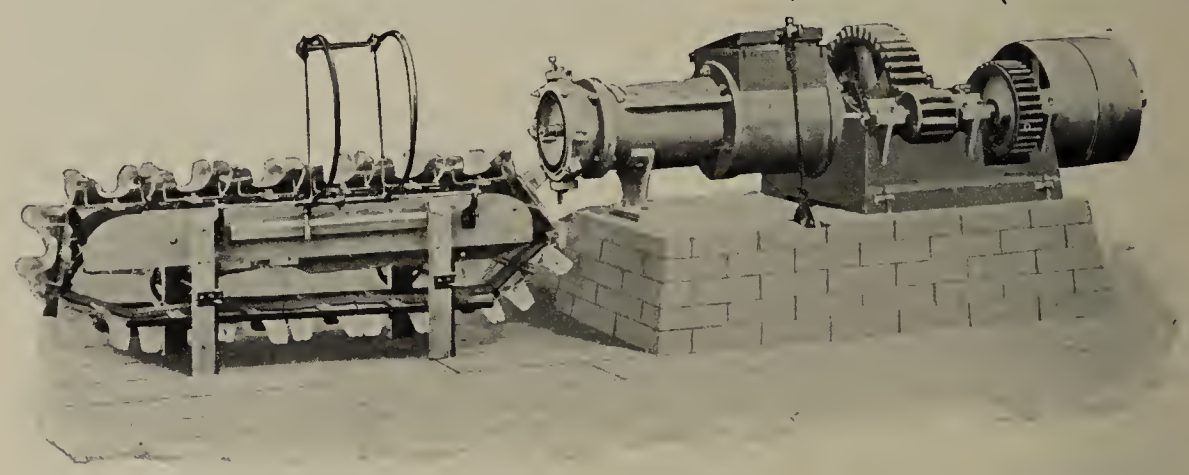
78 South Pennsylvania St., INDIANAPOLIS, IND.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.
Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.
Full line of Tile and Brickyard supplies kept constantly on band. Get our prices.

MADDEN & CO., Rushville, Ind.

Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,

Detroit, Mich., U. S. A.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va., Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

Evens & Howard Fire Brick and Sewer Pipe Company.

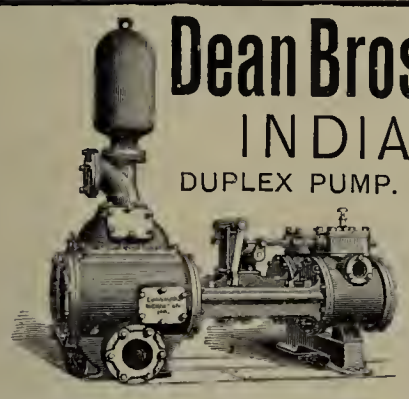
ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Dean Bros.' Steam Pump Works

INDIANAPOLIS, IND.

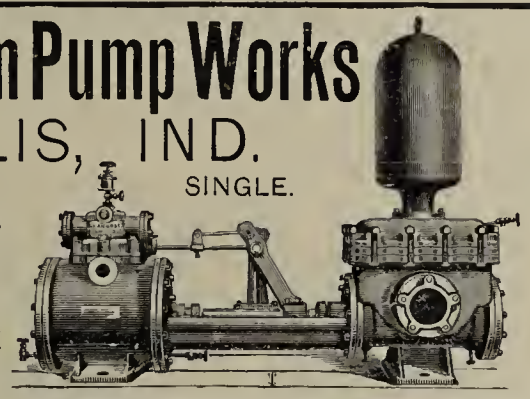


DUPLEX PUMP.

PUMPING MACHINERY FOR ALL PURPOSES.

SEND FOR CATALOGUE AND PRICES.

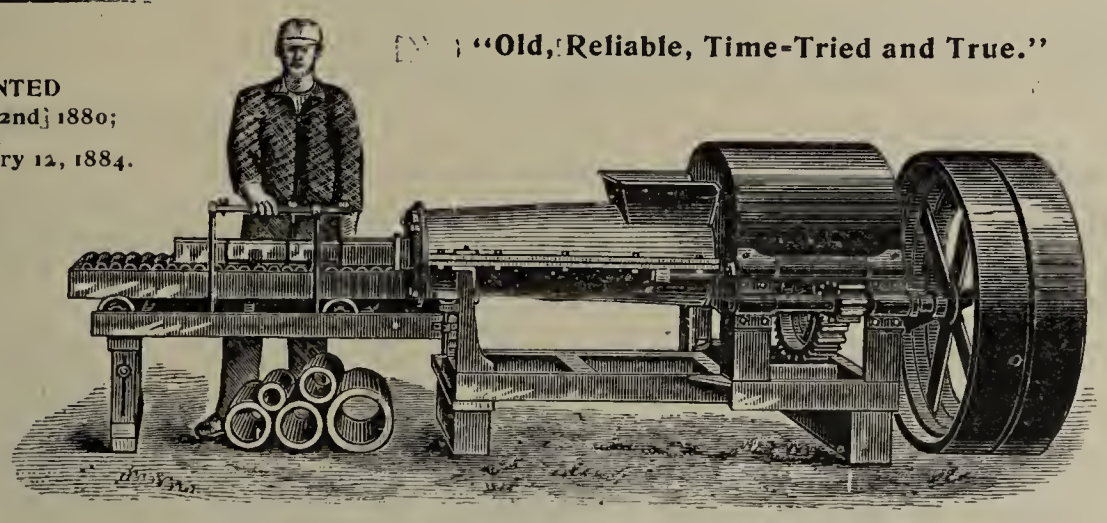
SINGLE.



KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED June 22nd, 1880; and February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.

T. W. CARMICHAEL,
Inventor and Manufacturer,
6 tf d Wellsburg, W. Va.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address

OLD BRICKMAKER,
1 tf d Care Clay-Worker.

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to

I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

FOR SALE.

Michigan brick and tile machine, with upright pug mill, pulleys, tile dies 2½ to 12 inch, hollow brick die, hollow block die, side and end-cut brick dies and all cutting tables.

No. 2 Adrian brick and tile machine, tile dies 2½ to 8 inch, side and end-cut brick dies and combination cutting table.

Board delivery cutting table, new.

Little Giant repress, same as new.

Kiln grates.

30 horse power tubular boiler, with front, stack and grates.

Canton duplex boiler feed pump, new.

40 horse power center crank engine.

40 horse power tubular boiler, all fixtures complete.

Penfield double plunge machine, tile dies 3 to 12 inch, brick die and all cutting tables, same as new.

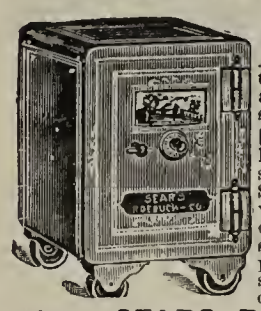
Rotary brick and tile table, nearly new.

65 foot, 8 ply, 14 inch Leviathan belting.

3 tf d J. F. CLARK, Morenci, Mich.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of WELLS & HALL,
Successors to WESTBROOK & WELLS,
Ogdensburg, N. Y.



$6.95 to $99.75

At from $6.95 for a 100-pound house safe to $99.75 for a very large double outside and double inside door bank or public office safe, we sell the **HIGHEST GRADE FIRE-PROOF COMBINATION LOCK SAFES MADE,** letter your own or firm name on, and ship to anyone any place in the United States, payable after received. For $23.95 we sell a good size safe for any store, office, factory, shop or hotel. **We will save you more than one-half in price.** For full particulars, special safe catalogue, special pay-after-received offer, etc., cut this notice out and mail to us. **SEARS, ROEBUCK & CO., CHICAGO.**

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.

NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. **Carbonate of Barytes**

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

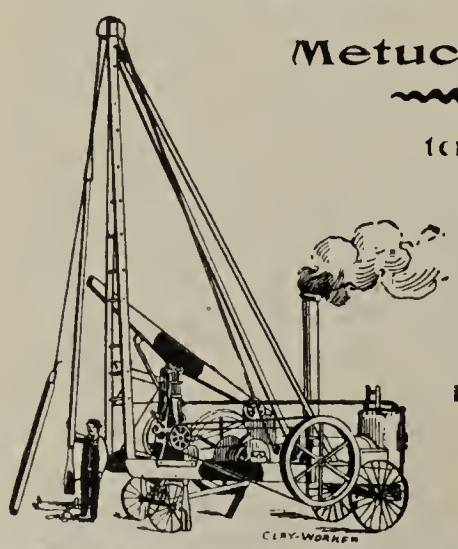
Circulars and Particulars on Application.

ODD LENGTHS OF RUBBER AND GIANT RED STITCHED, from 2 ft. to 50 ft. long, and from 1 in. to 16 in. wide; 3, 4, 5, 6 and 8 ply. **First-Class Belting** less than mfrs. cost prices. **Get Our Prices** on Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gages, Brass Fittings, Hard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weiler Jacks, Circular Saws, Sawing Machines, One-Man Log Saws, Asphalt Felt Roofing, Endless Thresher Belts. **One Trial** will make you a regular customer of the **MILLER OIL AND SUPPLY COMPANY, 36 McNabb St., Indianapolis, Ind.**

VanDuzen's STEAM JET Pumps. Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** etc., for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

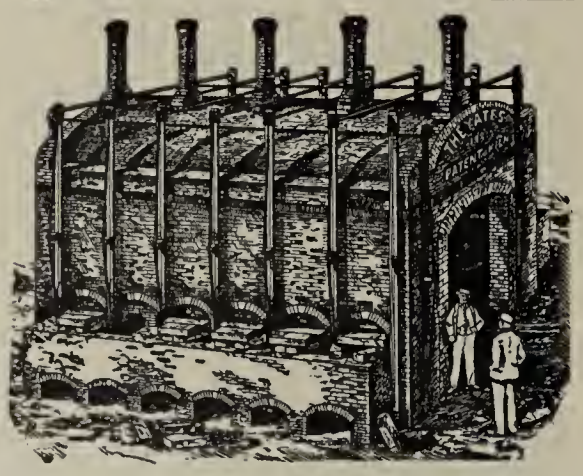
W. R. Osborne,



Metuchen, N. J.

for Wells, Tanks, Pumps, Etc.

LOW PRICES



Economy of Fuel and Large Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns. Hot air dryer. Continuous and Muffle Kiln

ALFRED YATES,
JOHNSONBURG, PENN

Have you thought About your Cuts for your NEXT CATALOGUE? We Make 'em Right

INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.
INDIANAPOLIS, IND.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } **Chenoa, Ill.**

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

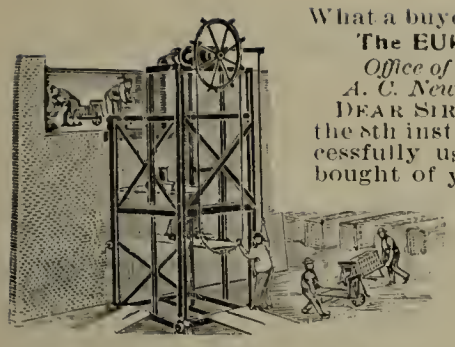
W. B. MERSHON & CO.,
Saginaw. East Side Mich.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.

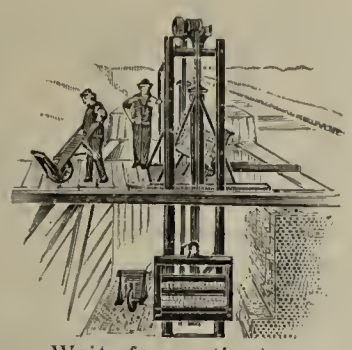


What a buyer in 1890 says to-day of
The EUREKA BRICK ELEVATOR

Office of the Buffalo Brick Association,
A. C. Newton, Patentee, Cresent, N. Y.

DEAR SIR—Replying to your inquiry of the 8th inst, this Association is still successfully using the two brick elevators bought of you in 1890. They are useful and practical machines, and the long and hard use of them by us shows that they are constructed in a very serviceable manner.

Very truly yours,
The Buffalo Brick Asso.
O. W. WAGER, Mgr



Write for particulars.

A. C. NEWTON, Manufacturer, Crescent, N. Y.

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

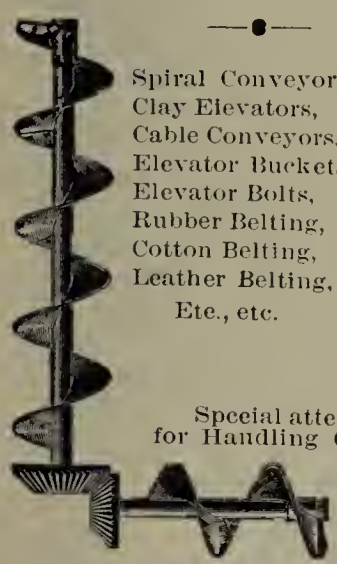
H. W. CALDWELL & SON CO., Western Ave. 17th-18th St. CHICAGO, ILL.

Our new Catalogue No. 25 (380 pages), will be sent upon application.

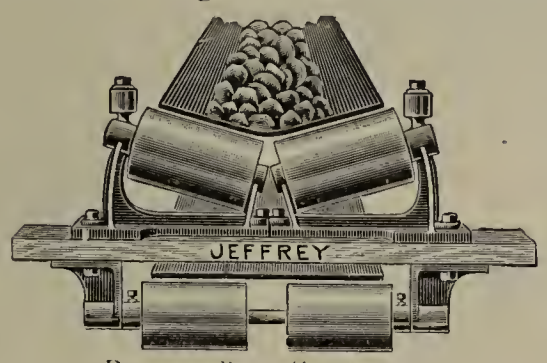
The JEFFREY MANUFACTURING CO., Columbus, Ohio.

Elevating, Conveying and Power-Transmission Machinery,

For Handling Material of all Kinds.



Spiral Conveyors,
Clay Elevators,
Cable Conveyors,
Elevator Buckets,
Elevator Bolts,
Rubber Belting,
Cotton Belting,
Leather Belting,
Etc., etc.



RUBBER BELT CONVEYORS.

Jeffrey Detachable Chain,
Chains, (all styles),
Sprocket Wheels,
Shafting,
Pulleys,
Hangers,
Gearing,
Elevator Boots,
Etc., etc.

Special attention given to the designing of machinery for Handling Clay, Green Tile, Brick, Sewer Pipe and packages of every description. We can in many instances effect a saving of from 10 to 50% over present methods used.

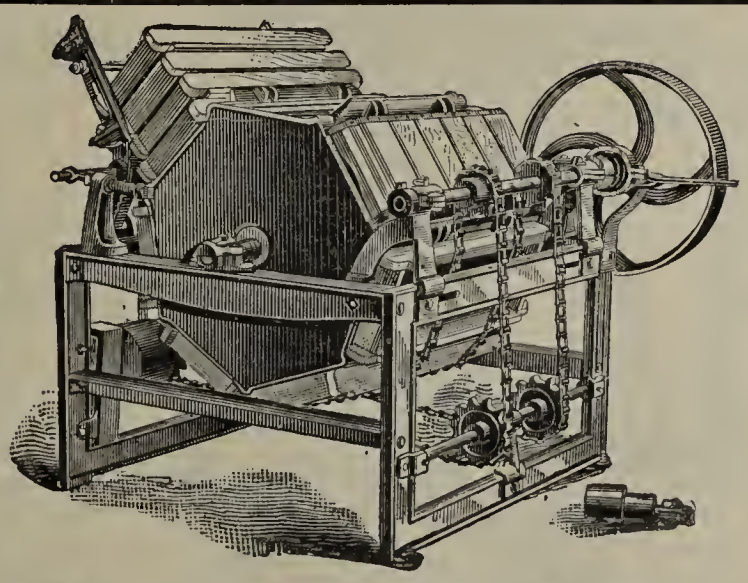
SEND FOR CATALOGUE AND PRICES.

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent. CINCINNATI, OHIO
H. W. FULLER, Gen'l Pass. Agent, WASHINGTON, D. C.

The VANDALIA LINE

The Short Line for St Louis and the West.

Leave Indianapolis.		Arrive at Terre Haute.	Arrive St. Louis
No. 15	7:25 am,	9:55 am	5:00 pm
No. 5	6:45 am	8:35 am	12:56 pm
No. 21	12:30 pm	2:05 pm	6:40 pm
No. 7	3:30 pm	5:10 pm	9:40 pm
No. 11	7:05 pm	9:00 pm	1:44 am
No. 19	11:20 pm	1:50 am	7:12 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No. 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.

All trains carry first-class coaches.

12:15 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent,
E. A FORD, G. P. A. Indianapolis, Ind.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 3:05 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 12:20 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY.

Lv Indianapolis, 4:10 am. 8:05 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY,
Industrial Agt., St. Louis, Mo.
or
E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between CINCINNATI and INDIANAPOLIS, DECATUR, SPRINGFIELD, JACKSONVILLE, HANNIBAL and QUINCY.

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	4.05 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

NIAGARA FALLS EXCURSION.

WAIT FOR THE OLD RELIABLE

Lake Erie & Western Railroad,

PERSONALLY CONDUCTED

NIAGARA FALLS EXCURSION

IN CONNECTION WITH THE

Lake Shore & Michigan Southern Ry.

LEAVE INDIANAPOLIS 11:15 AM.,

Thursday, August 2, 1900,

RATE: $7.00 FOR ROUND TRIP.

ALSO

SANDUSKY and PUT-IN-BAY

WITH SIDE TRIPS TO

LEWISTON, TORONTO, THOUSAND ISLANDS, ETC.

For tickets, rate, time and pamphlet containing general information, call on any ticket agent of the above route, or address

C. F. DALY,
General Passenger Agent, Indianapolis, Ind.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

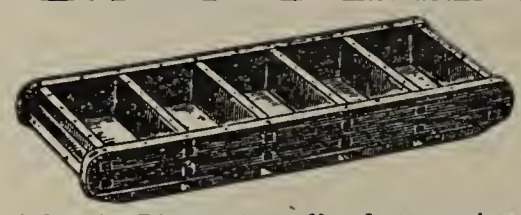
For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**



We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.

Increases grinding capacity.

Gives a finer grade of clay

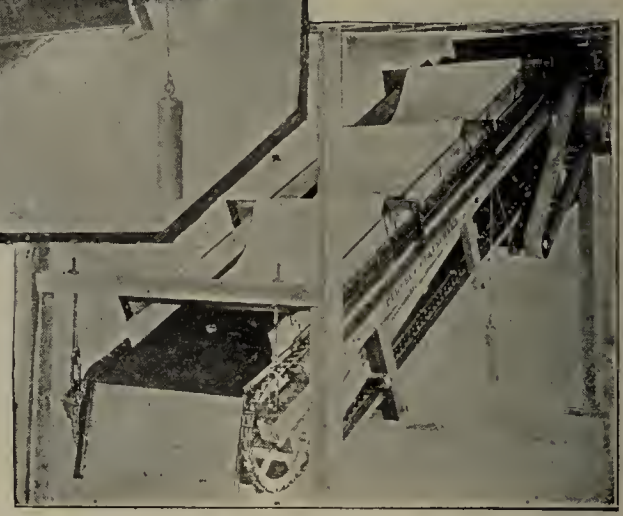
Does the work as well in cold weather as in warm.

Screens cold moist clay as well as dry.

It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush.

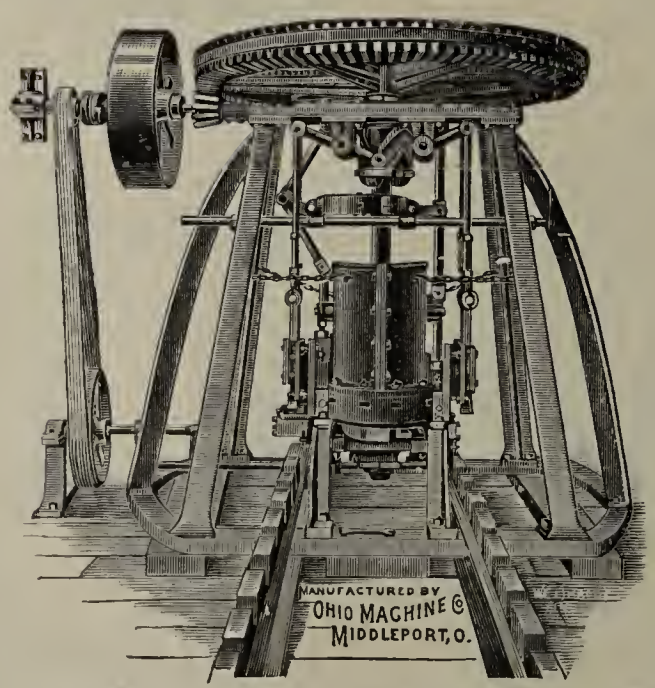
HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

The AJAX BRICK MACHINE,



MANUFACTURED BY THE

Ohio Machine Co.,

MIDDLEPORT, OHIO.

The well known and high class street pavers and building brick coming from the Ohio Valley are made on this machine, the above Company have several machines ready for shipment, and are prepared to place a machine with responsible parties on very easy terms, parties interested can send a few barrels of clay to the makers (freight prepaid), they will be pleased to make samples and ship green and burned brick for inspection, the machine is POSITIVELY guaranteed, and intending purchasers will do well to write the Ohio Machine Company for particulars.

COLUMBIA, MO.--A New Location for Fire Clay Manufacturing.

Population 6,000; two railroad systems (M., K. & T. and Wabash); midway between St. Louis and Kansas City; abundance of hardwood, also of elm and cottonwood; inexhaustible coal fields; choice building stone; **great fields of fire clay**; seat of University of Missouri, tuition free; also two large female colleges and other schools; sixty miles of gravel roads; healthful and prosperous; excellent location for manufacturing products sold to the people of the growing southwest. Address **SECRETARY, Box 234, Columbia Improvement Club, Columbia, Mo.**

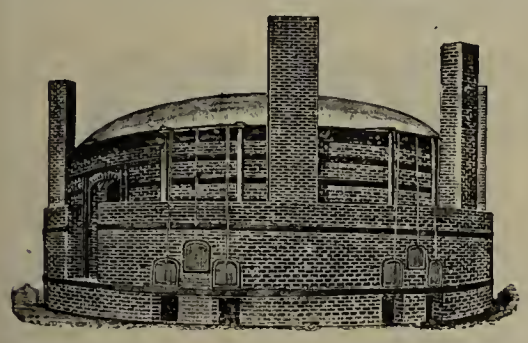
MORRISON'S LATEST IMPROVED KILN

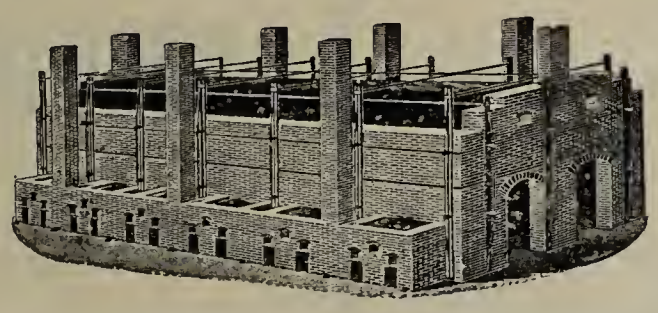
FOR BURNING BUILDING BRICK.

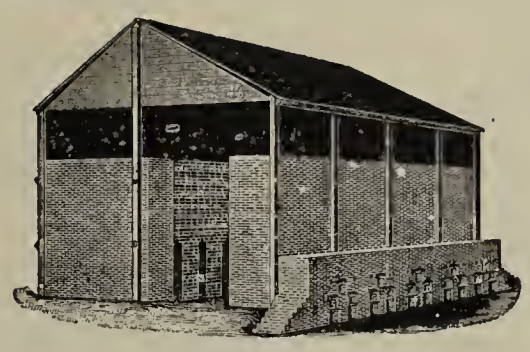
It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object. Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO., P. O. Box 335, Rome, Ga., U. S. A.

The THREE KINGS.

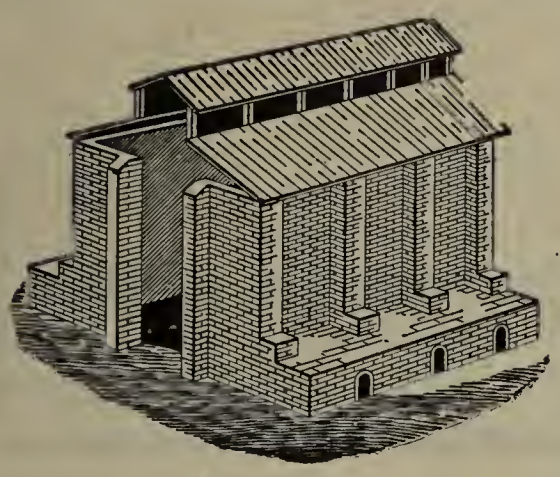






SWIFT SLACK COKING TABLE FURNACE KILNS. Over 700 old kilns changed and many new ones built in the past year. Send for Catalogue and Price List of Plans and Specifications.

F. E. SWIFT, Washington, Iowa. U. S. A.

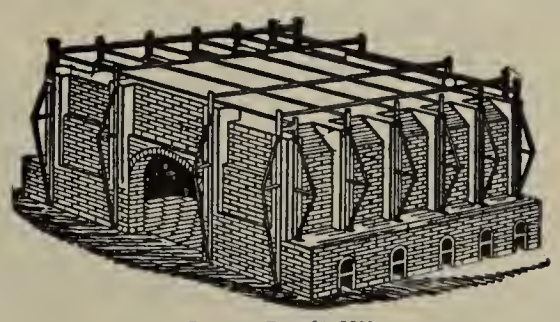


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL,* 2,422 Chestnut St., *Kansas City, Mo.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades.
Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING.

SYRACUSE, N. Y.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

THE COALDALE BRICK AND TILE CO.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

COALDALE VITRIFIED PAVERS,
Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

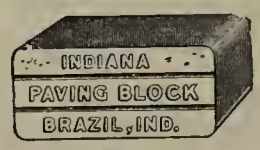
Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT, COALDALE, ALA.
TELEGRAPH OFFICE, WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

INDIANA PAVING BRICK AND BLOCK CO.

W. W. WINSLOW, Proprietor.



Street Paving Brick and Block.

TELEPHONE 1190.
OFFICE: 1 HUBBARD BLOCK,
INDIANAPOLIS, IND.

Works at BRAZIL, INDIANA.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date.
By H. A. Wheeler, E. M.
Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

R. D. CULVER, Pres. and Gen'l Man.
I. G. POSTON, Sec'y and Treas.

The Wabash Clay Co.,

MANUFACTURERS OF ALL SHALE

PAVING BRICKS AND BLOCKS.

Our leading brands are POSTON BLOCK, WABASH STANDARDS, "SPECIALS," for crossings on macadam streets, GUTTER BLOCKS and COLUMBIAN SIDEWALK BRICK.

Our material has for years successfully stood the heaviest traffic of Indianapolis, Terre Haute, East St. Louis and dozens of other large cities of Indiana and Illinois. We ask investigation and comparison by those seeking the best paving material. Samples furnished on application.

Office and Works at VEEDERSBURG, IND.

Preston Brick Co.,

MANUFACTURERS OF

Vitrified Shale Paving Brick,

SEWER AND HARD BUILDING BRICK.

Hornellsville, N. Y.

T. B. McAVOY, PRESIDENT.
FRANK B. McAVOY, SEC. AND TREAS.

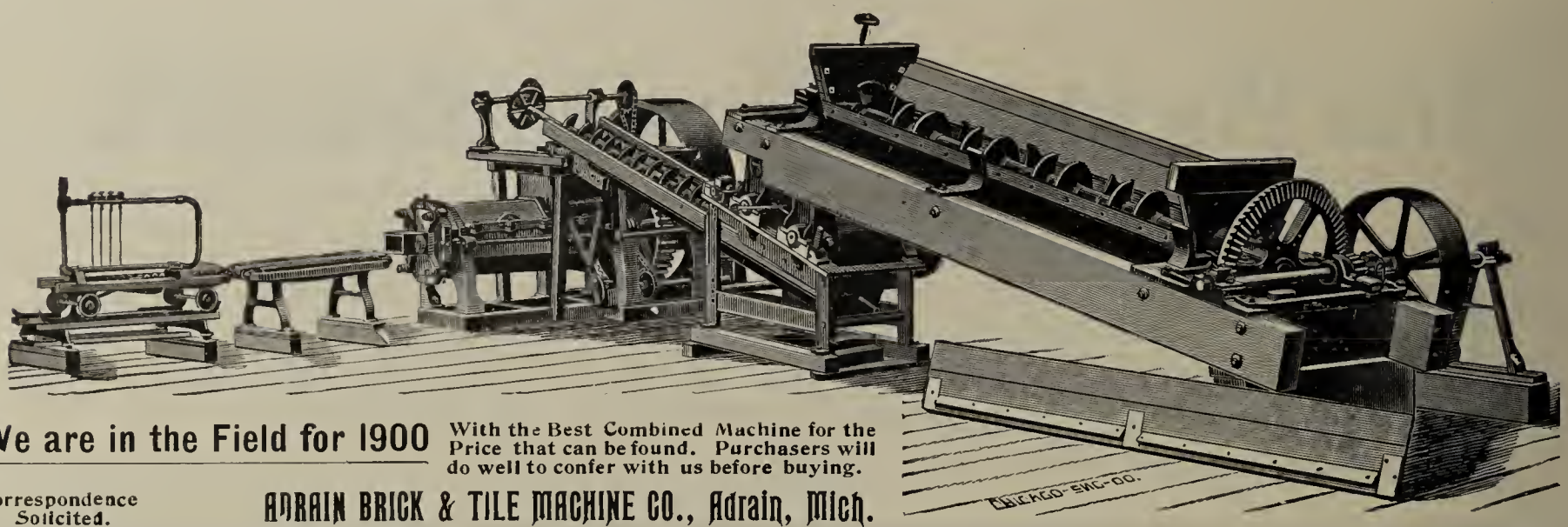
McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.



We are in the Field for 1900 With the Best Combined Machine for the Price that can be found. Purchasers will do well to confer with us before buying.

Correspondence Solicited.

ADRAIN BRICK & TILE MACHINE CO., Adrain, Mich.

La Brique, (The BRICK,)

Prices of Advertisements for One Year:

One Page, £16.
One-half Page, £10.
One-quarter Page, £6.
One-eighth Page, £4.

ORGAN OF THE BRICK AND CERAMIC INDUSTRIES IN THE FRENCH SPEAKING COUNTRIES.

Published each Month. Annual Subscription Six Shillings.

5,500 copies sent by post and guaranteed by receipt from Postmaster general. All correspondence to be addressed to

Mr. H. DeWit,

61 Rue Bodeghem, Bruxelles, (Belgium.)

Outing BICYCLES.

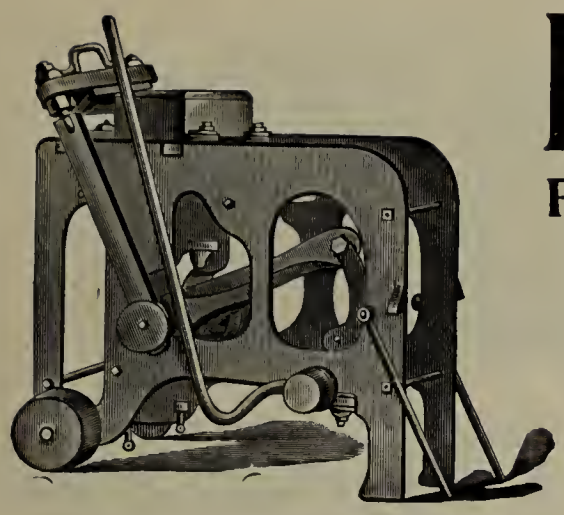
ARE made of the best material, embody the best ideas and are constructed by skilled mechanics. They are reliable and strong. If we have no agent in your city, get our Catalogue and net prices.

Chainless $75.00.
Racer $60.00. Cushion Frame $60.00.
Road Wheels $50.00, $40.00, $30.00.

OUTING M'F'G. CO.,

Indianapolis, Ind.

Ask the Publisher of this Paper what he thinks of the "OUTING."



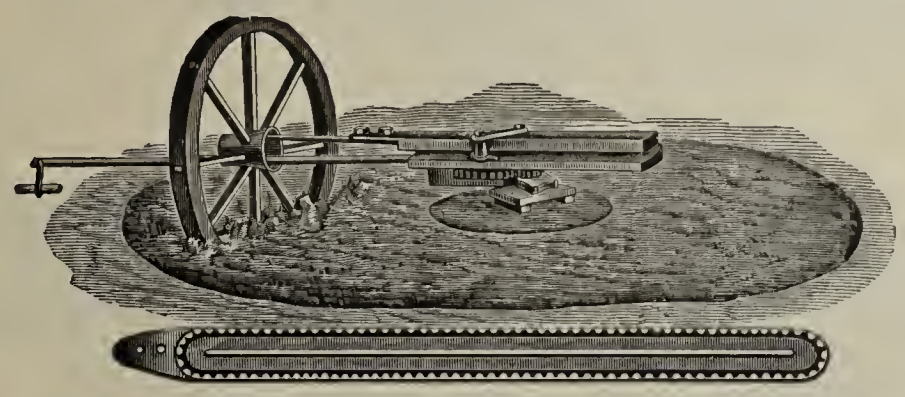
RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

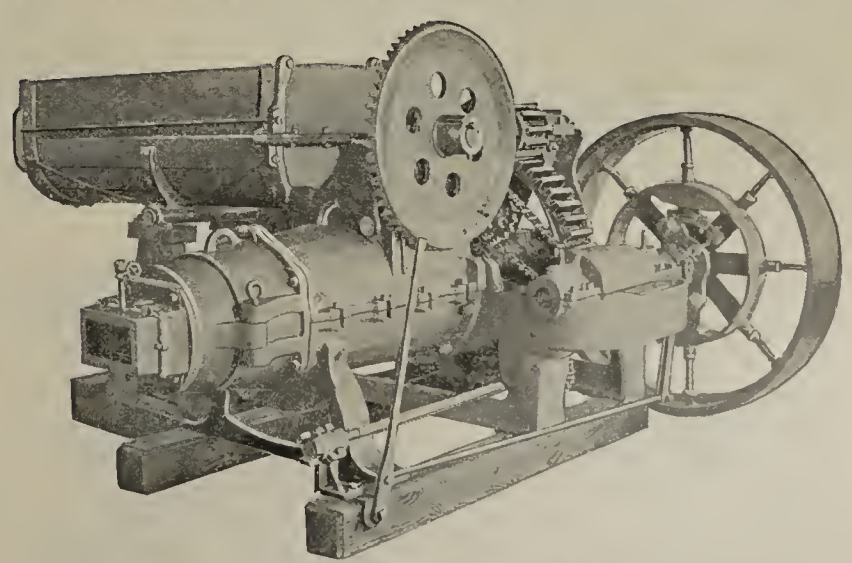
[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED

TAKE A LOOK

At this for a Combined Machine. It has the advantages of other combined machines and others besides. It does not interfere with the stiffness and rigidity of the machine "proper."

The feed end of Pug Mill is clear of all machinery. Pug Mill is hinged so it can be raised clear of Machine, leaving everything free of access.

Let us talk to you about it.



All That Could be Desired.

Kinston, N. C., March 27th, 1900.

Messrs. J. C. STEELE & SONS, Statesville, N. C.

Gentlemen:—We herewith enclose check for $—— in settlement of the brick machine, cutting table, etc., purchased of you a short time ago, for which kindly send us receipt.

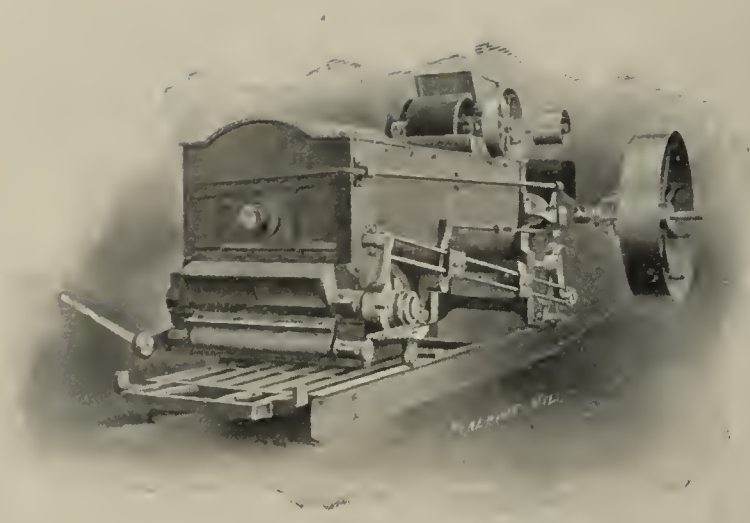
The machine is working well and we are extremely well pleased with it. It is all that could be desired.

Very truly yours, L. HARVEY & SON.

J. C. STEELE & SONS,

Manufacturers of
The "NEW SOUTH" BRICK MACHINERY,

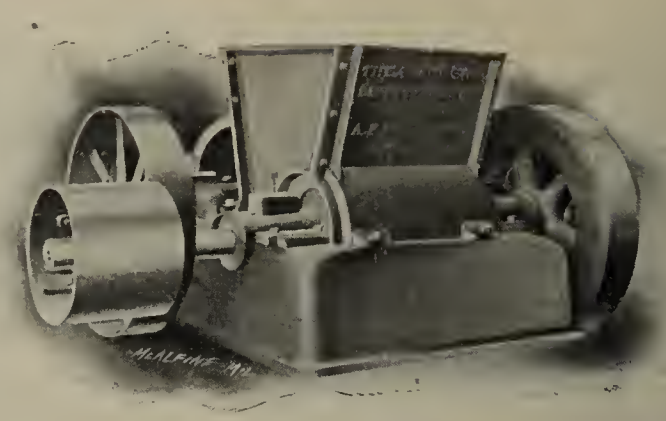
Statesville, N. C.



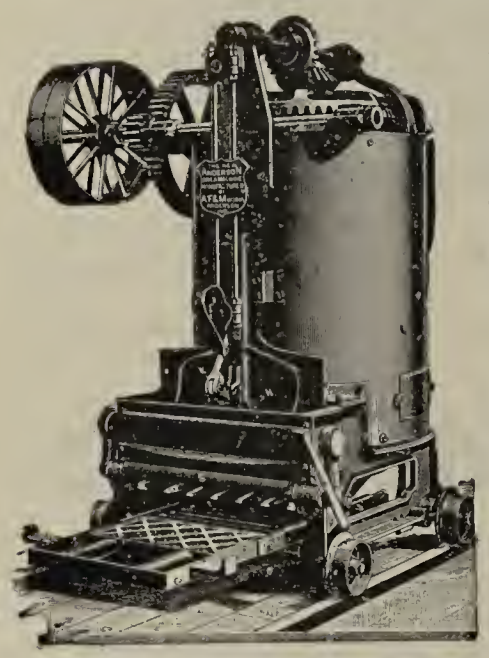
Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



Best Disintegrator on the Market.



Steel and Iron Upright Stock Brick Machine.

MANUFACTURERS OF . . . .

New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

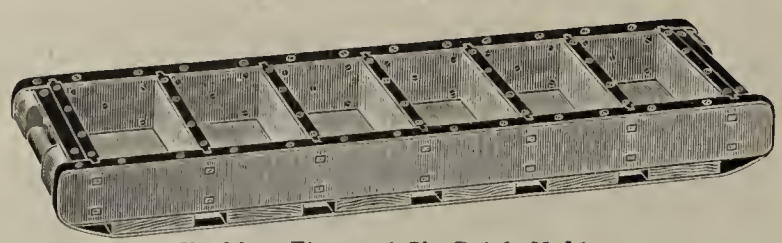
Pug Mills, Moulds, Trucks and Barrows,

And all Brickyard Supplies.

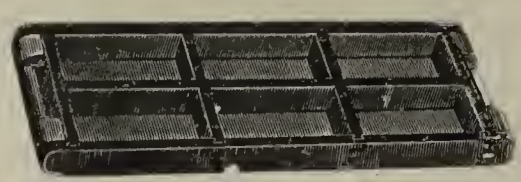
1899 Horse Power Machine.

The Anderson Foundry and Machine Works,

Anderson, Ind.

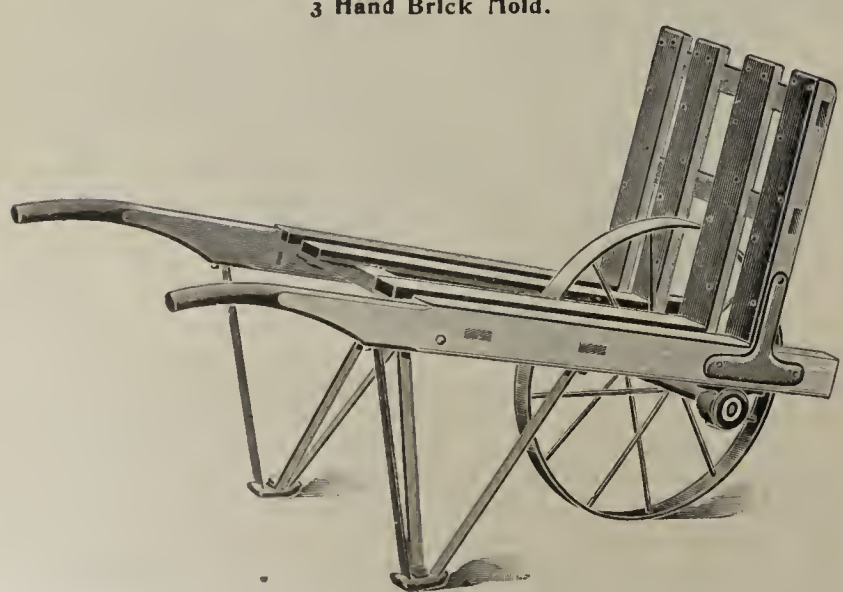


Machine, Five and Six Brick Mold.



6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

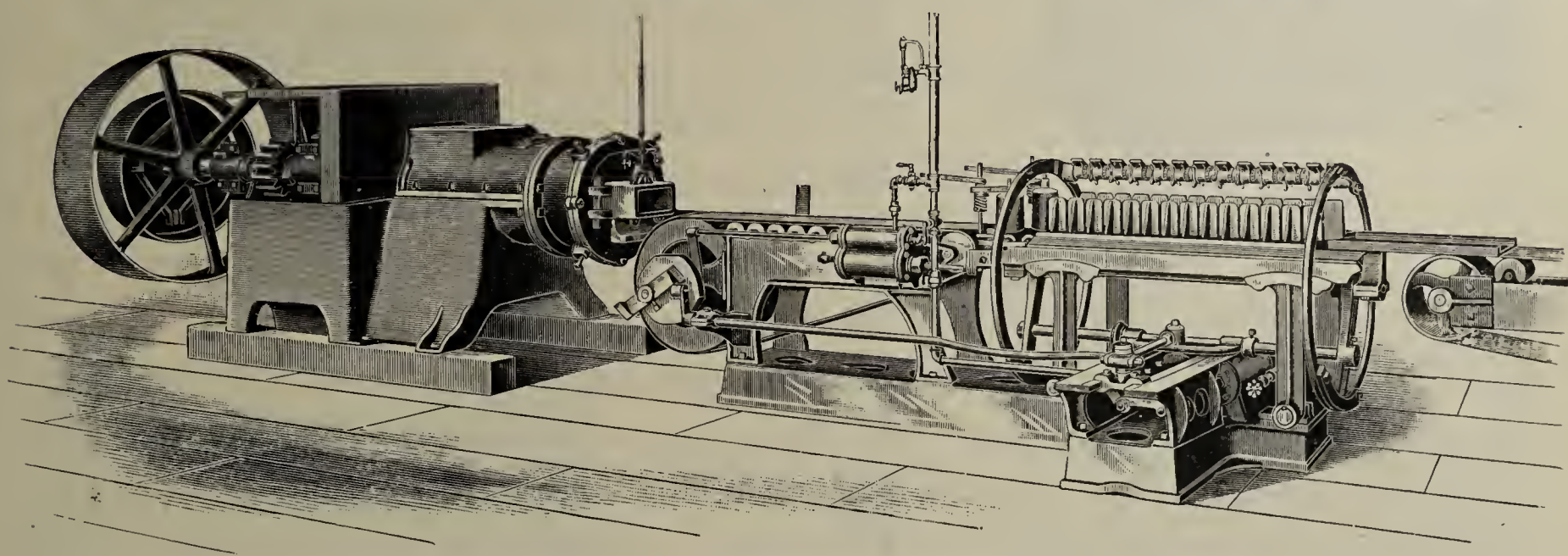
D. J. C. ARNOLD,

New London, O.

You Obtain More for Your Money

(When Purchasing)
(While Using)

Leader Machinery

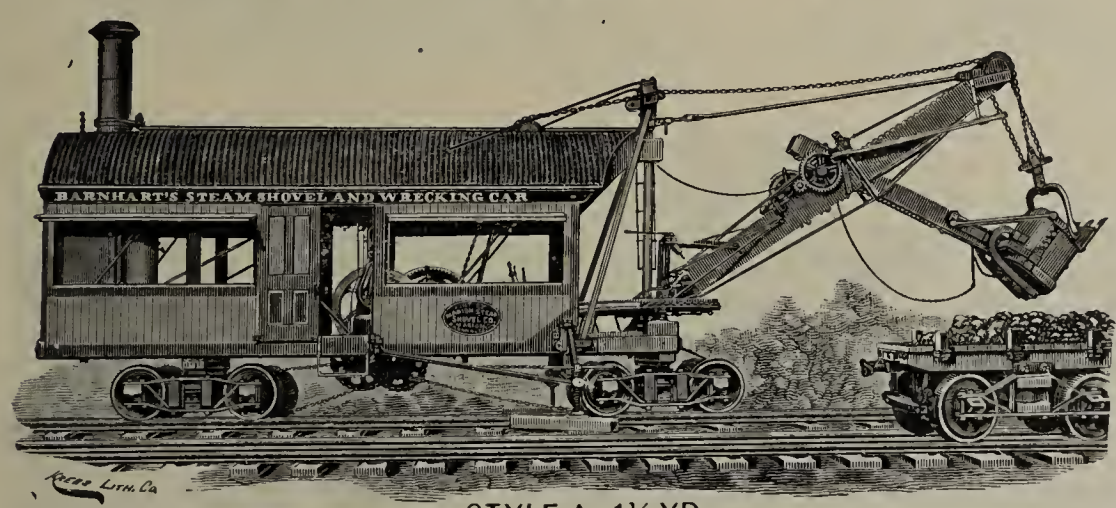


Leader No. 25 with Side Cut Die and Automatic Cutter.

LEADER MACHINES are most economical because they are properly designed and well built. They do good work with least waste. Printed matter illustrating and describing **Leader Brick Machines, Pug Mills, Crushers, Presses,** etc., free.

LEADER MANUFACTURING CO., Decatur, Ill.

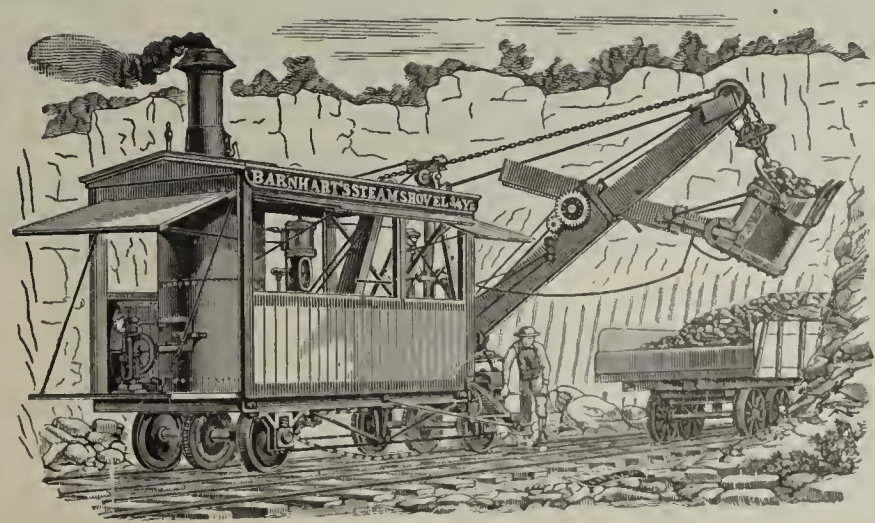
Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.



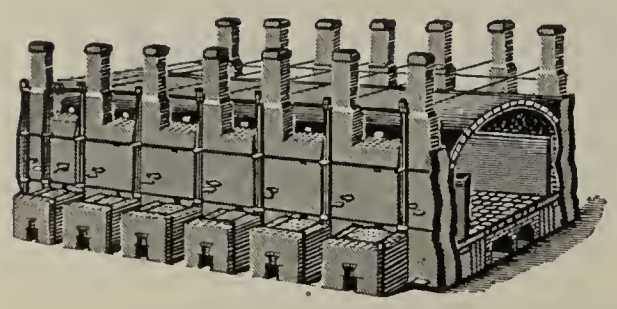
STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Oaks, Pa., January 26, 1900.
M. M. BUSHONG, Phoenixville, Pa.

Dear Sir:—Your letter of inquiry of the 25th inst, in regard to kiln received; in reply will say it gives us great pleasure to say that your kiln is doing splendid work, we have made eleven (11) burns and they were all a great success, in fact it surpassed our expectations in every particular, both to quality of paving brick produced and the amount of coal consumed and we contribute its success to the perfect system of drafts and absolute control of same. In other words if your kiln does not burn evenly from top to bottom or wall to wall it is the fault of the man in charge and not the kiln.

We have had a wide experience in the kiln line and do not hesitate to say that your kiln is the best for burning Shale Paving Brick to be found.

We can assure you that in the future should we build more kilns they will be the **Bushong Down Draft.** Wishing you success we remain,

Yours respectfully,
PERKIOMEN BRICK CO.,
Per HAGGINBOTHAM, Supt.

BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.

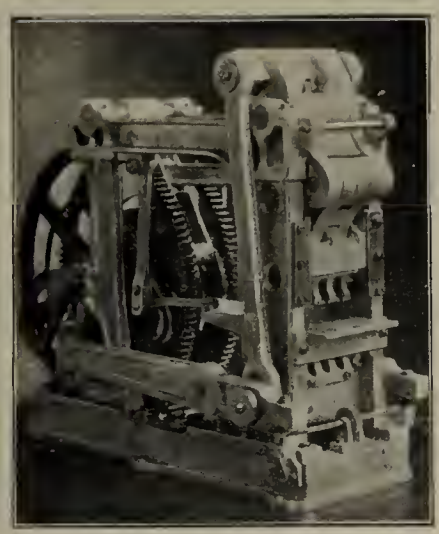
These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

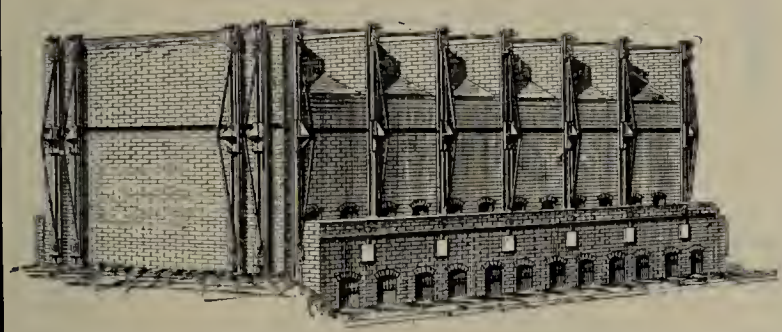


The GRATH DRY CLAY BRICK PRESS.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

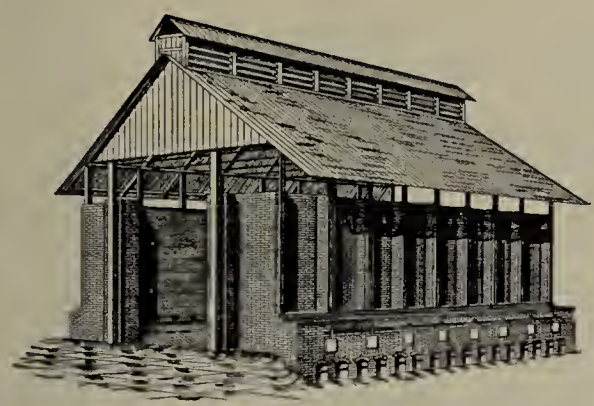
Features:

1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Requires less power to Operate.
5th. Brick free from Granulation.
6th. All Bearings Bushed.
7th. All parts Accessible.
8th. Thickness of Brick Changed without Stopping.
9th Master Wheels Close to Bearings.
10th. No Working parts under Lower Cross Head.



The GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH GRATH GAS AND COKING FURNACES ATTACHED Built Round, Square and Continuous. Perfect results guaranteed. No soft, overburned or flashed brick, uniform throughout.



The Grath Up-Draft Kiln.

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with slack coal, with better results than lump coal in ordinary Furnaces and without any black Smoke.

The Grath Gas and Coking Furnaces

Can be attached to ALL kinds of Kilns, either old or new, and produce better results with SLACK than lump coal in ordinary furnaces. PROTECTION GUARANTEED TO ALL USERS. WILL PROSECUTE ALL INFRINGEMENTS.

The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK. The only successful Press of its kind in the market.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

The Coffeyville Vitrified Brick and Tile Co.

MANUFACTURERS OF

Repressed Vitrified Paving, Building and Face Brick and Drain Tile

Plants at Coffeyville, Cherryville and Independence, Kan. Daily Capacity 325,000

Coffeyville, Kansas, April 30, 1900.

W. P. GRATH, Pres.,
The ILLINOIS SUPPLY & CON. Co., ST. LOUIS, Mo.

DEAR SIR—Replying to your favor of the 24th inst., we are very much pleased to state that the Hand Power Press which we purchased from you is giving perfect satisfaction, and is making a very fine grade of ornamental brick, with less than half of the expense and more than double the capacity of the screw press.

Wishing you success in the sale of this machine, we are

Yours very truly, THE COFFEYVILLE VITRIFIED BRICK & TILE CO.
Per W. H. MAHAN, Gen'l Mngr.

For Further Information and Catalogue on Above, address

The Illinois Supply & Construction Co., ST. LOUIS, MO., U. S. A.

Mention The CLAY-WORKER.

BEHOLD!

Is it not Written?

If Ye Have Aught to Do

DO IT.

You Know

Hot Air Is necessary for the drying of brick

Why Not Heat the **Air** instead of heating water to make Steam, and then attempting to radiate the heat from several miles of steam pipe?

Others are saving **$15.00 per day** by the use of our **Buckeye Dryer,**

Why Not You.

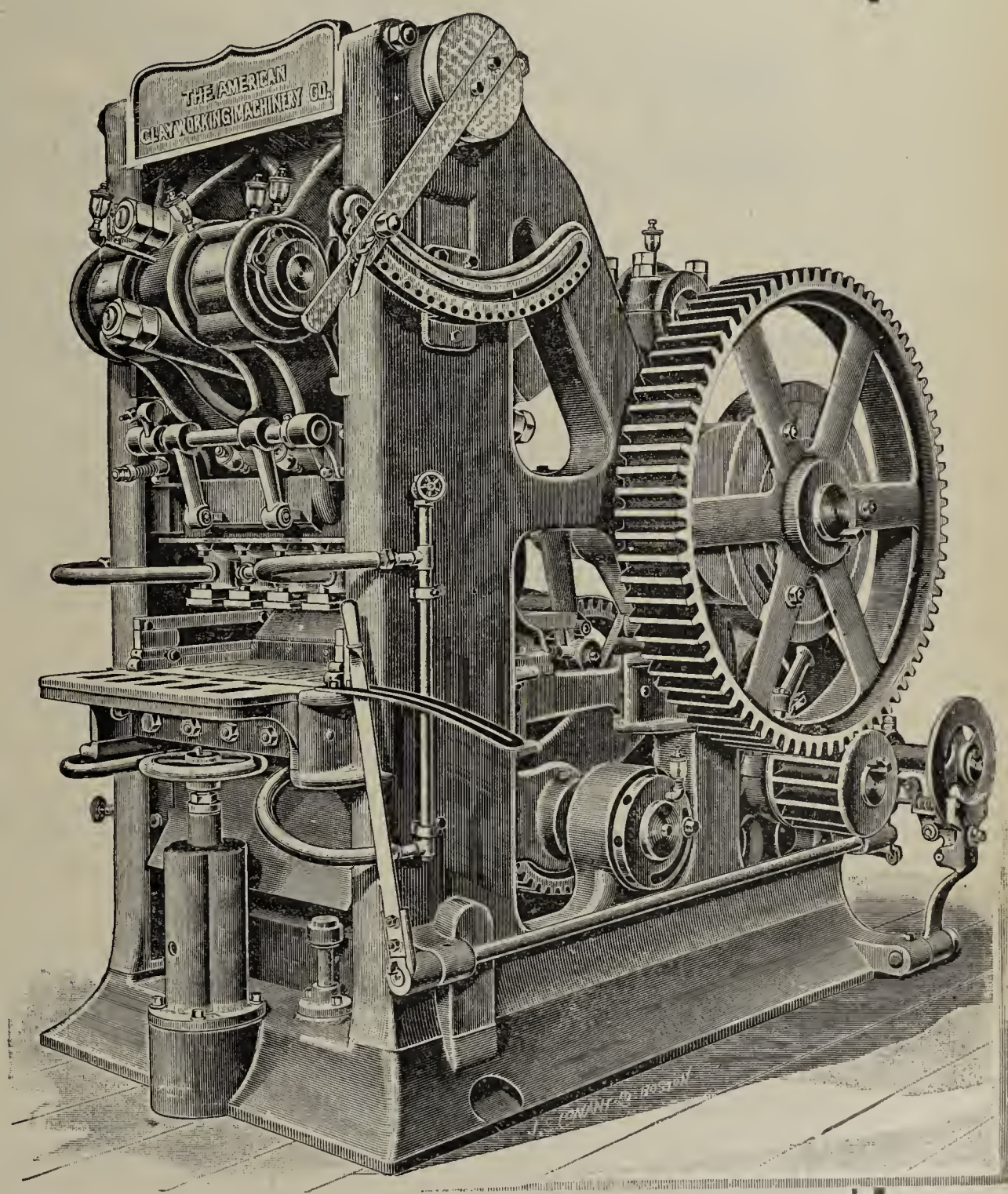
Write Us and we will do the **Rest.**

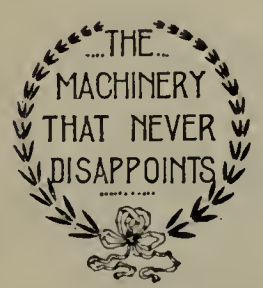
The CLEVELAND CAR CO.,
CLEVELAND, OHIO.

It's Up To You!

Built Right.
Run Right.

THE first requisite of a successful machine is the principle on which it works. No matter how good the making or material, no matter how alluring the price may be, if the principle is not good it is an undesirable machine, which will eventually land its owner in bankruptcy or the mad house and itself in the scrap heap. An investment in such machinery is little better than criminal. Look thoroughly into the market before you buy, then if you do not buy our machinery your misfortune will be an error of judgment only. We have kept a constant step with the clay business for half a century. The same exacting care which has kept us in the front rank of manufacturers is keeping us in the lead. Some of our most popular machinery is our dry press line. They're "Built Right and Run Right." If you are in the market write us. We build dry press, stiff mud and soft mud machines. Our complete catalogue for the asking.





The American Clay-Working Machinery Co.,

NEW YORK OFFICE:
39 and 41 Cortlandt Street.

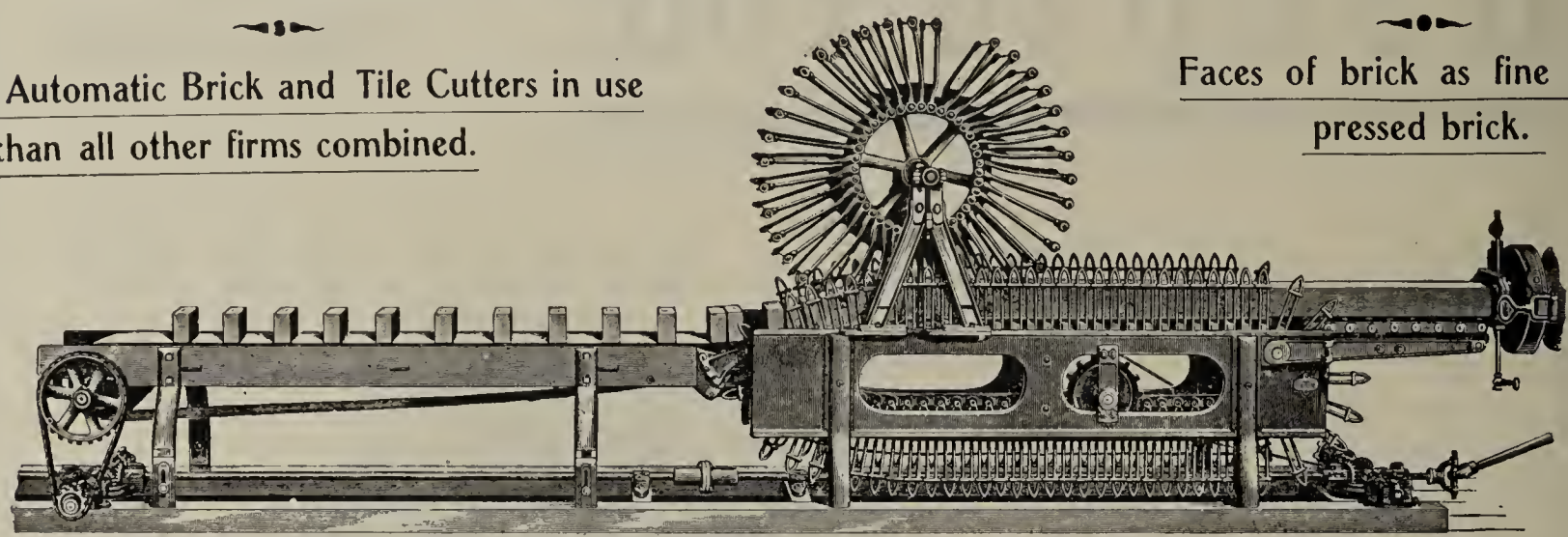
BUCYRUS, OHIO, U. S. A.

PROGRESSIVE BRICK MAKERS

Are not easily deceived. They know the value of **points** like these—**Strength, Endurance, Reliability,** no "break-down," no "lay-off," but **every day** full capacity of **brick of guaranteed quality.**

More Automatic Brick and Tile Cutters in use than all other firms combined.

Faces of brick as fine as re-pressed brick.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Did we hear somebody say "Merry-go-Round" or "Wire Bird Cage?" Well, it's a "Merry-go-Round" we've had this Spring to keep up with our orders for Bensing's Automatic Brick Cutting Tables. Just listen to the song the little bird in the wire cage sings:

The Only Table

That gives an absolute down cut—
Correct in principle and mechanism.
Which has a continuously rotary motion, not stopping and starting between each cut.
Which doesn't cut a waste brick (except by accident) at every cut.
Which has no long steel bottom board over which the column must slide.

This Table

Breaks one-tenth less as many wires as other tables, and if a wire does break, gives more than four times as long to replace it as any other table.
Requires less than five per cent of the oil used by other tables.

The manufacturers of this table do not guarantee it to do as good work as any other, but BETTER WORK—they guarantee it to deliver on the off-bearing belt, better, smoother faced, sharper edged brick than can be produced by any other brick cutter ever made.

A full line of "Stiff Mud" Brick Machinery.
Also "Soft Mud" Brick Machinery, both Steam and Horse Power.
Write us for Catalogue of the **best** brick machinery built.

J. D. FATE & CO.,

Manufacturers of

BRICK AND TILE MACHINERY.

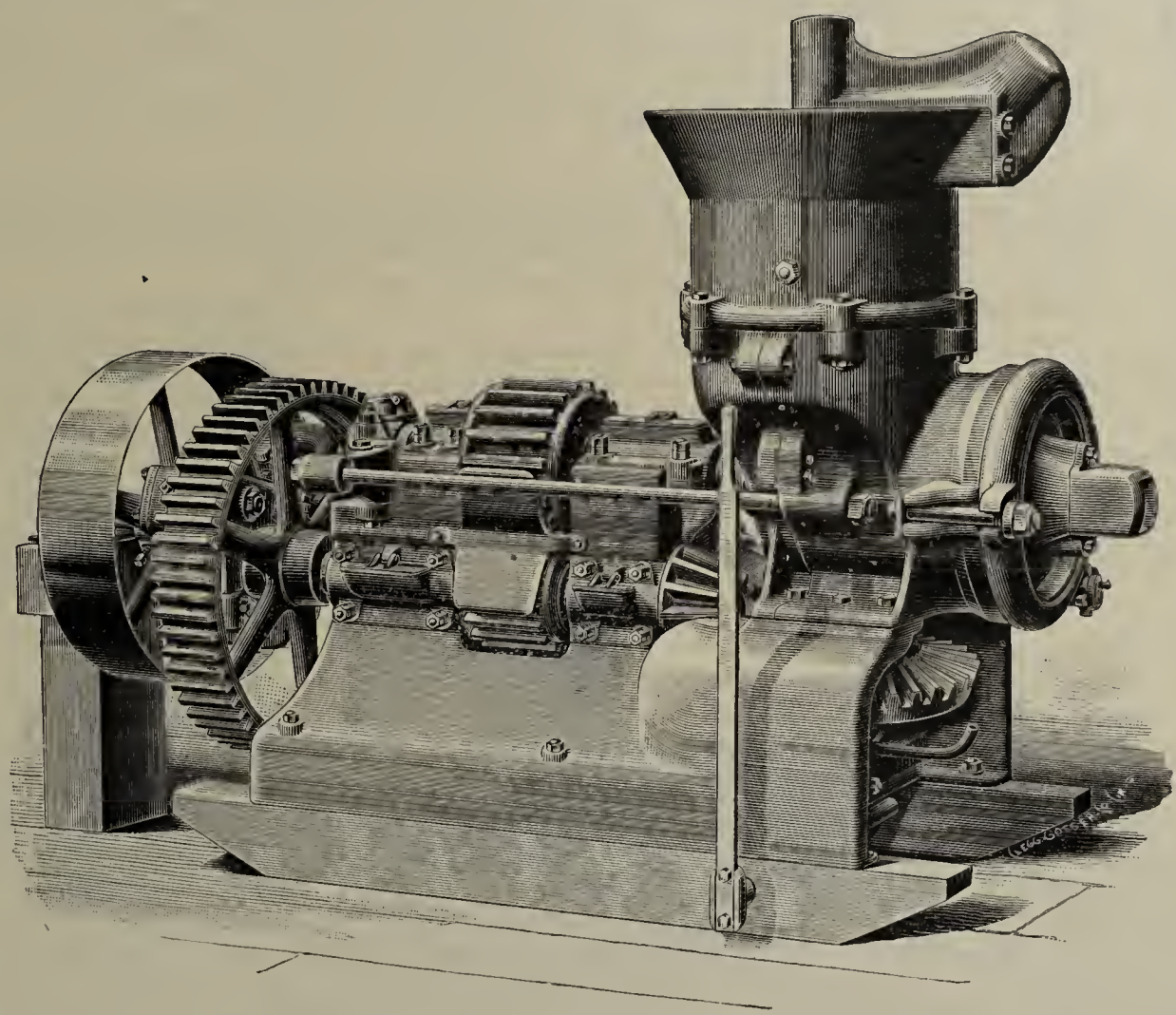
PLYMOUTH, OHIO.

Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.
Agent for Virginia and North Carolina: H. L. JACOBS Suffolk, Va.

Wonder Brick Machinery.

SOLD ON ITS MERITS.

SEND FOR CATALOGUE. **WRITE FOR PRICES.**



Intermediate Wonder Brick Machine.

BE PROGRESSIVE—There is nothing gained by staying in the back ground. Life is what we make it. and the enviornments have a great deal to do with the disposition.

Make life pleasant by having your surroundings up-to-date.

You can do this by buying a Wonder Machine.

The **WONDER** is no experiment, having been on the market some fiifteen years, and each year it is improved and brought up to the latest mechanical ideas.

The Wallace Mfg. Co.,

Frankfort, Indiana.

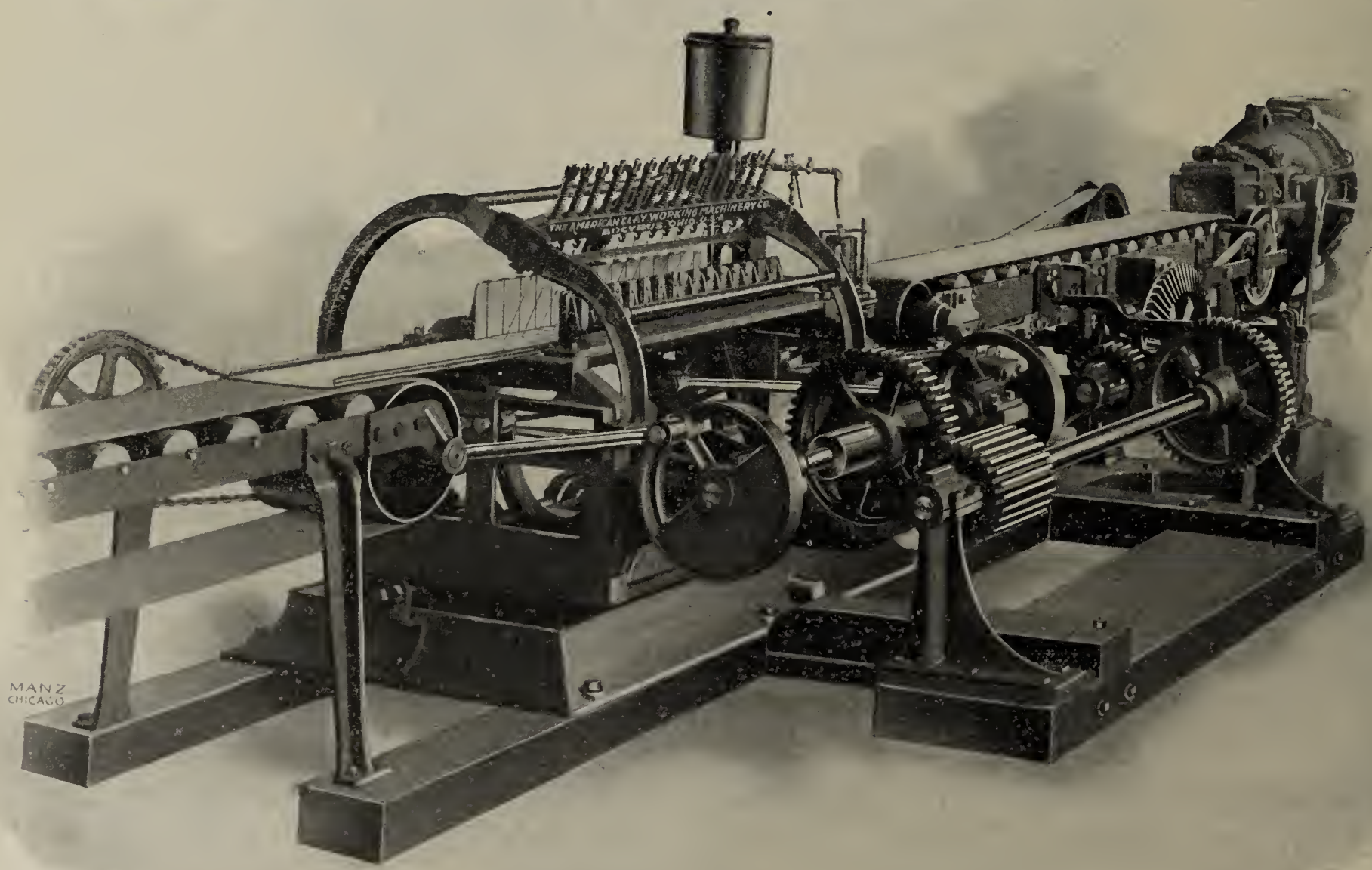
WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

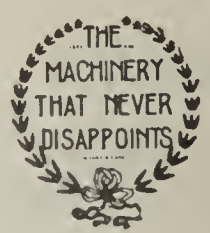
SOUTHERN MACHINERY CO., Charlotte, N. C., Agents for Tennessee, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina and Virginia.

Make Him Write It In the Contract.

DURING THE PAST FEW WEEKS a purchaser, who wanted to be sure of his purchase, stipulated in his contract that the machinery must be guaranted to be as good in every way as that manufactured by the **AMERICAN CLAY-WORKING MACHINERY CO., of Bucyrus.** The manufacturer accepting this order puts his name to the acknowledgement that our line is the **Standard of Excellence**. Not only that, but if the contract is lived up to—to the letter—he will have to take out his machinery because there is no other line of clay-working machinery equal to that of the American Co. It may appear to be as good but its the ceaseless operation, year after year, which shows the quality of material and faultless construction of our machines. Its a safty factor to yourself to be protected. If some other manufacturer claims his machinery is "just as good" as the American line, **make him write it in the Contract,** and make him **FULFILL THE GUARANTEE.**

Our new side cut **Oscillating Automatic Down Cut Table** is the cutting table success of late years. Its a machine to be pround of from start to finish. If your not informed regarding its advantages write us. We manufacture a full line of clay-working machinery and appliances. Make your wants known or send for our catalogue.





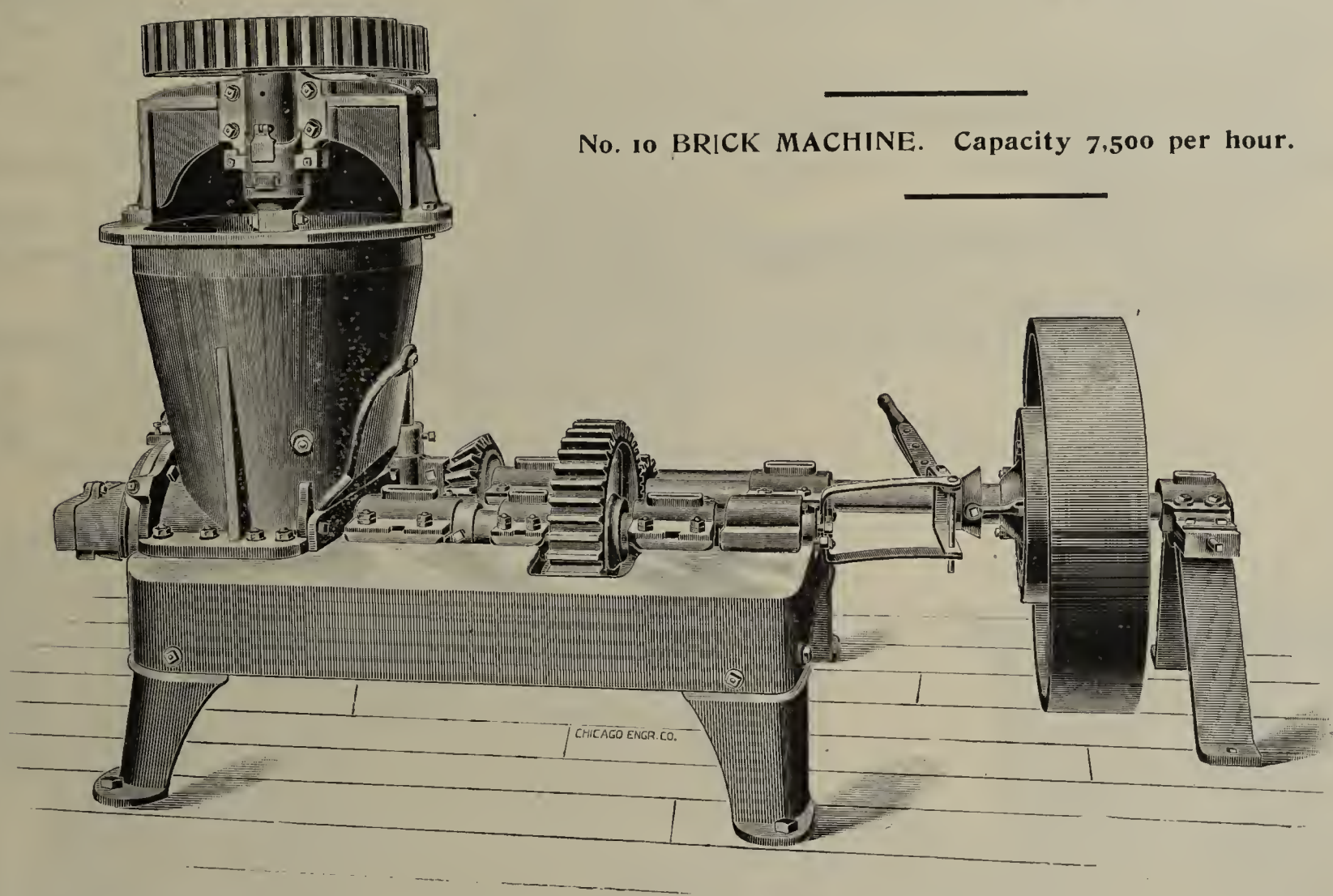
The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

NEW YORK OFFICE, 39 and 41 Cortlandt St.

"Get Your Money's Worth"

WHEN a man is buying Brick Machinery there is a duty which he owes himself. He naturally seeks the most value for his money and if his search is diligent he will find just what he is looking for in our **No. 10**



No. 10 BRICK MACHINE. Capacity 7,500 per hour.

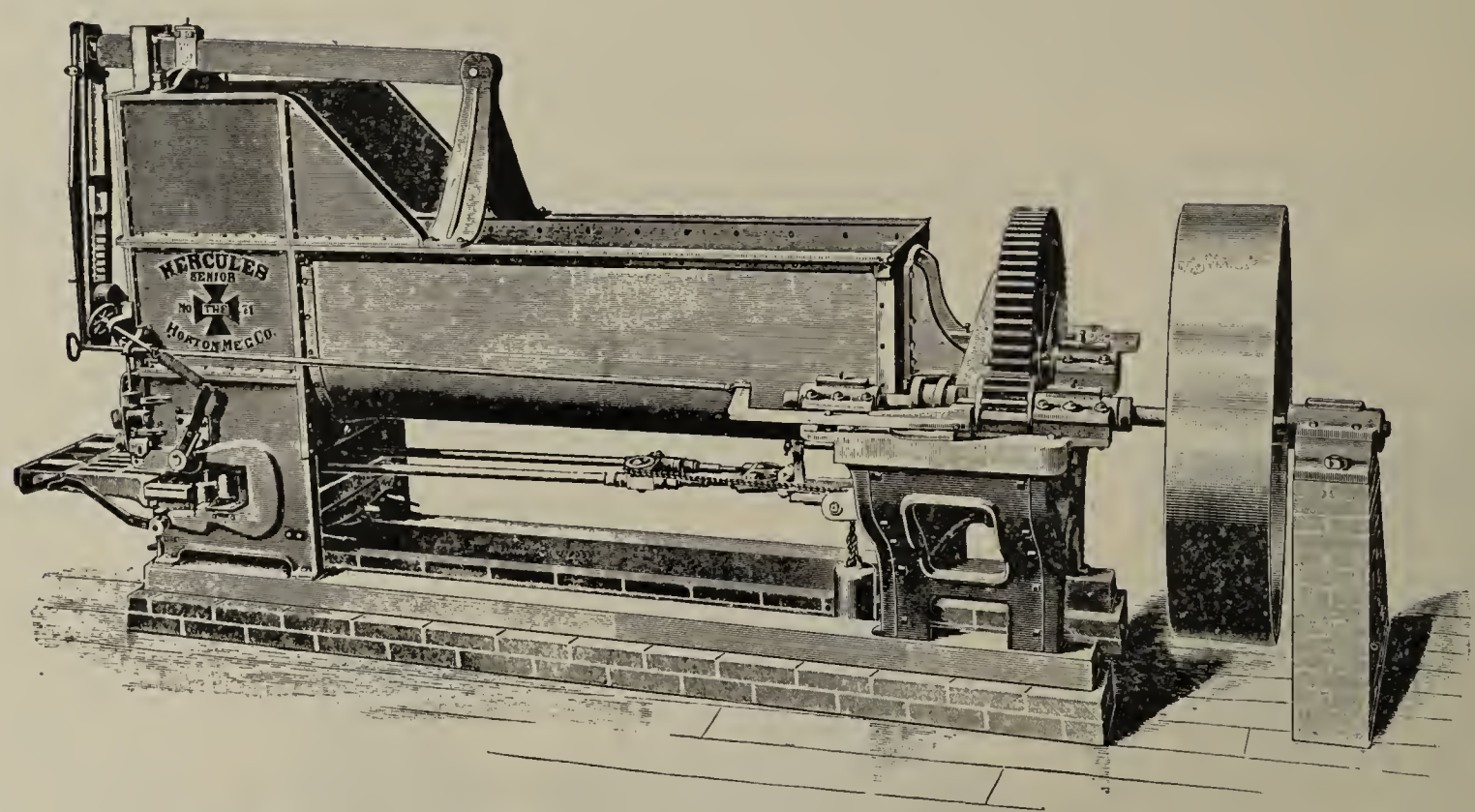
Machine. It has a spotless reputation and has yet its first failure to be recorded against it. Does not this fact demand your respect.
Send for Catalogue and Prices.

H. BREWER & CO.,

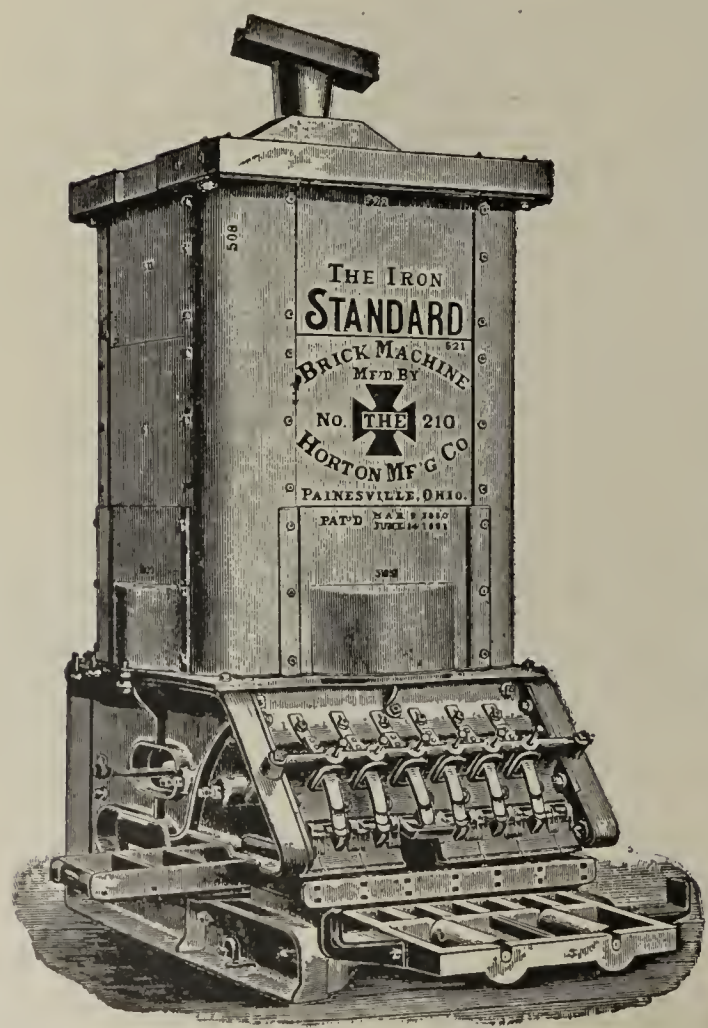
TECUMSEH, MICH., U. S. A.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES



IRON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brickyard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

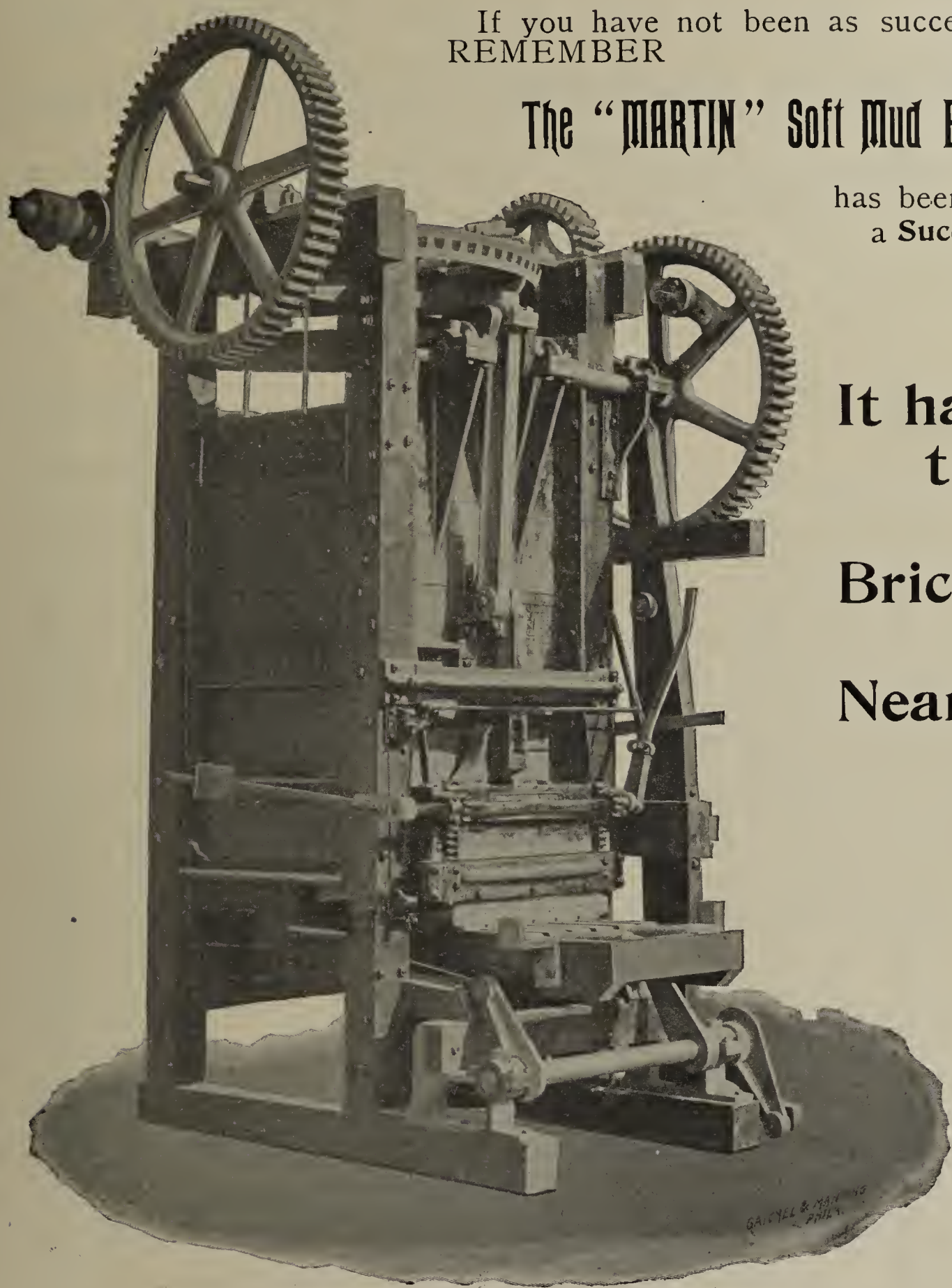
Write us for 1900 CATALOGUE C.

Start the New Year Right.

If you have not been as successful as many others REMEMBER

The "MARTIN" Soft Mud Brick Machinery

has been the making of many a **Successful Brickmaker.**



It has stood the test of Brickyard life for Nearly half a Century.

Up-to-Date Equipments are OUR Specialty.

We Furnish Everything a Brickmaker Needs.

Our new Catalogue contains much useful information.

THE HENRY MARTIN BRICK MACHINE MFG. CO., INCORPORATED.

Sole Manufacturers of the "Martin" Patents,

LANCASTER, PENN., U. S. A.

Some Interesting Reading

As well as Fair Warning to All.

The Patents Owned by

C. & A. Potts & Co.,

Are declared Valid by The Highest Courts in Our Land.

Don't take chances of Purchasing other so-called Disintegrators, you are Liable to get into Trouble. You take no risk when Purchasing a POTTS. Neither of Infringements Suits or quality. They are The best on EARTH.

UNITED STATES CIRCUIT COURT,
Southern District of Ohio, Western Division.

C. AND A. POTTS AND CO.,
vs.
FRANK F. CREAGER, HARRY M CREAGER and JONATHAN CREAGER.
No. 4,244. In Equity.

PERPETUAL INJUNCTION.

THE PRESIDENT OF THE UNITED STATES OF AMERICA
TO
Frank F. Creager, Harry M. Creager and Jonathan Creager, their clerks, attorneys, servants, agents and workmen, and any and all persons acting by, through or under the authority of said defendants or either of them.

WHEREAS, it has been represented to us in the Circuit Court of the United States for the Southern District of Ohio, Western Division, on the part of C. and A. Potts and Co., complainant, that it has lately exhibited its Bill of Complaint against you, the said Frank F. Creager Harry M. Creager and Jonathan Creager, defendants, to be relieved touching the matter therein complained of, in which Bill it is stated, among other things, that Letters Patent of the United States No. 322,393, for Improvements in Clay Disintegrators, were issued on July 14. 1885, in due form of law, to Clayton Potts and Albert Potts, and that said Letters Patent have been properly assigned to and are now owned by the said C. and A. Potts and Co., the complainant herein, and that you, the said Frank F. Creager, Harry M. Creager and Jonathan Creager, have infringed the rights secured by the aforesaid Letters Patent, by making and selling to others Clay Disintegrators embodying the invention set forth and claimed in the said Letters Patent, contrary to the form of the statutes in such cases made and provided, and that your said acts and doings in the premises are contrary to equity and good conscience.

Now, therefore, in consideration thereof, and of the particular matters in the said Bill set forth, you, the said Frank F. Creager, Harry M. Creager and Jonathan Creager, your clerks, agents, attorneys, servants and workmen, are strictly commanded and enjoined under the pains and penalties which may fall upon you, and each of you, in case of disobedience, that you forthwith, and **perpetually** hereafter until the expiration of said patent, absolutely desist and refrain from any further manufacture, sale or use in any manner of the patented improvements, or any part thereof, in violation of the rights of the said C. and A. Potts and Co. under the said Letters Patent of the United States No. 322,393.

Witness, the Honorable MELVILLE W. FULLER, Chief Justice of the Supreme Court of the United States, and the seal of the Circuit Court of the United States for the Southern District of Ohio, Western Division, this 27th day of March, A. D. 1900, and the one hundred and twenty-fourth year of the Independence of the United States of America.

B. R. COWEN,
[SEAL] Clerk.

Received the writ at Cincinnati, Ohio, on the 28th day of March, 1900, and on the same day served the same on the within named Harry M. Creager and Frank F. Creager, by handing to each of them personally a true copy of this writ with all the endorsements thereon. And on the 30th day of March, 1900, I served the same on the within named Jonathan Creager by leaving a true copy of this writ with all the endorsements thereon at his usual place of residence, placing same in the hands of his wife.

V. J. FAGIN. U. S. Marshal S. D. O.
By W. J. Sanderson, Deputy.

Southern District of Ohio, Western Division. } ss.

A true and correct copy of the original Perpetual Injunction on file in the Clerk's office of the United States Circuit Court at Cincinnati, Ohio.

Attest: B. R. COWEN, Clerk,
By Robt. C. Georgi, Deputy.

MANUFACTURED ONLY BY

C. & A. POTTS & CO., = Indianapolis, Ind.

BRICK MANUFACTURERS CANNOT AFFORD TO IGNORE THE SPLENDID QUALITIES OF THE CLAYWORKING MACHINERY MANUFACTURED BY **C. & A. POTTS & CO.**

Horizontal Stock Brick Machines.

All Iron or Wood Frame.

PUG MILLS, DISINTEGRATORS, MOULD SANDERS, and all Brick-yard Supplies.

They have invariably become recognized leaders in every locality, invincible in the yards and in all contests, winning their way by fine work and lasting qualities and positive economy. They are up-to-date, progressive machines, with all the latest improvements. Well Built, Strong and Durable.

There have been more Potts Machines sold this season than ever before fully one-half of which have gone to yards to replace machines which were sold last season because they were "just as good" as the Potts, and cheaper.

When you purchase a Potts Brick Machine, Disintegrator or Sander, you take no chances and get the best machinery for the money on the market.

TRY US.

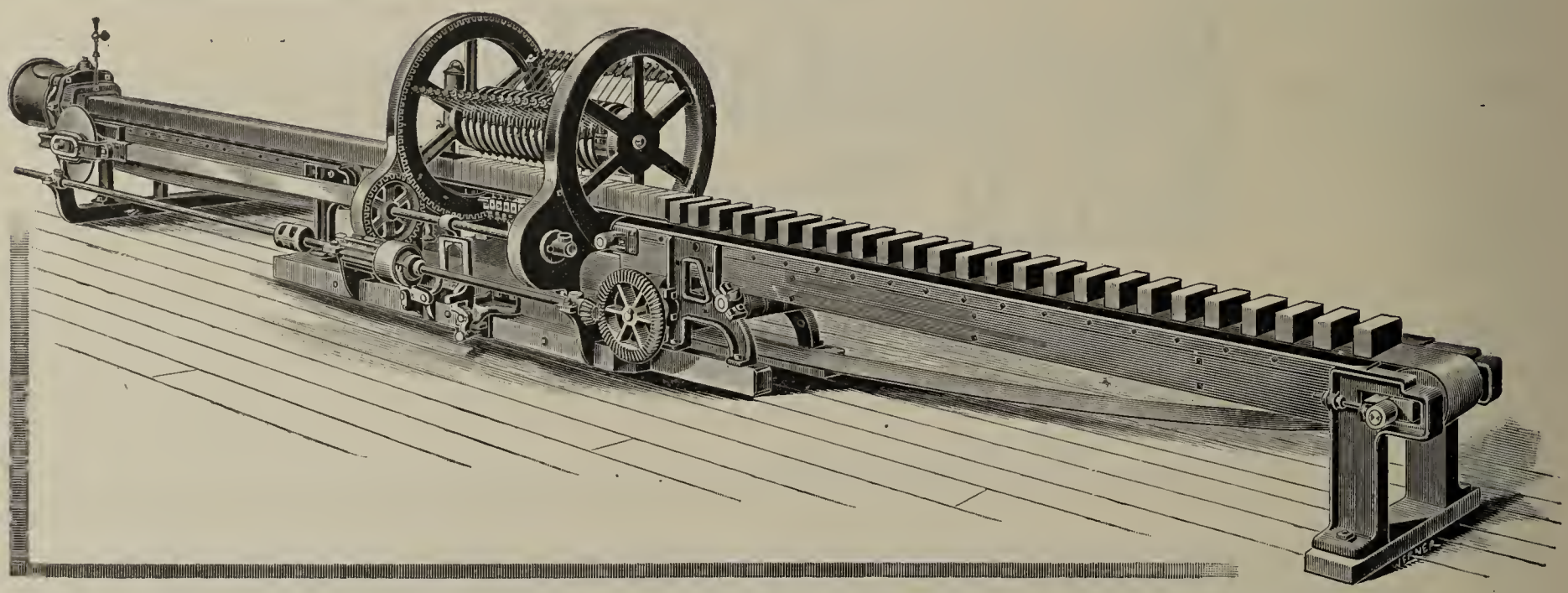
C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

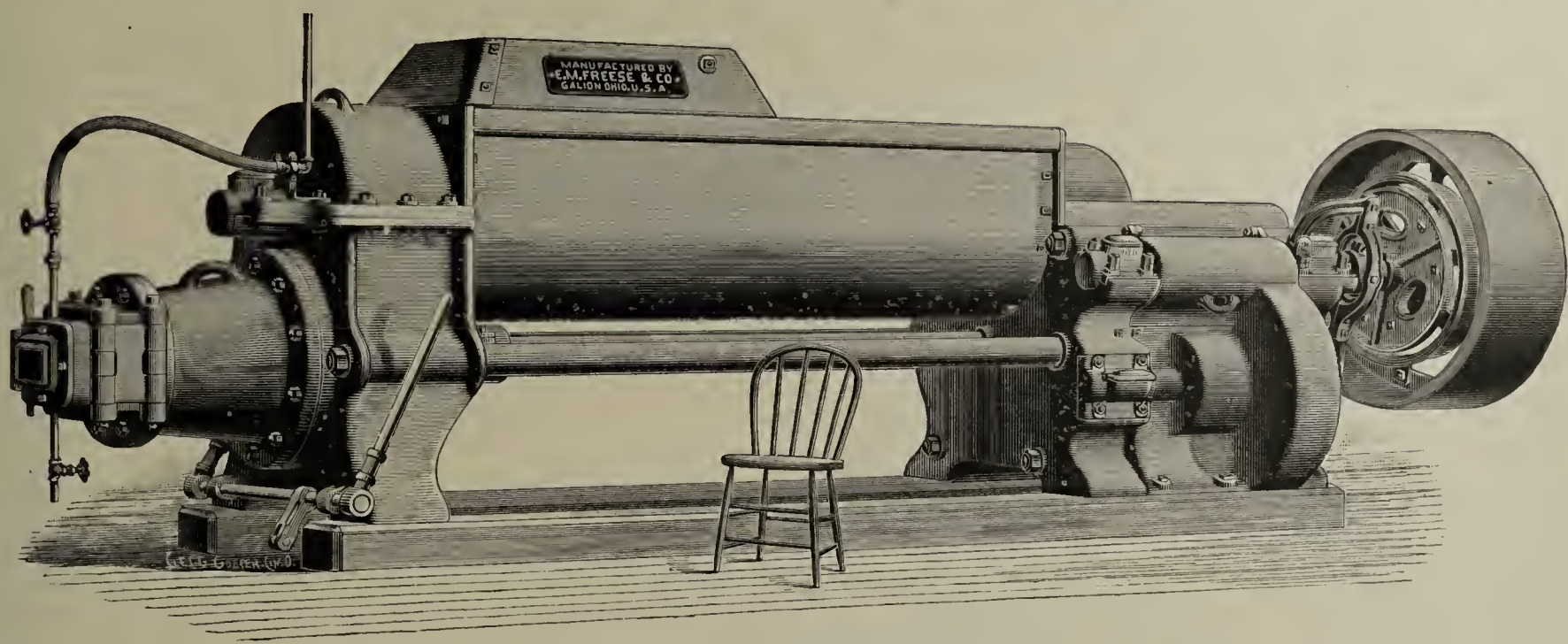
POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

E. M. FREESE & CO.,

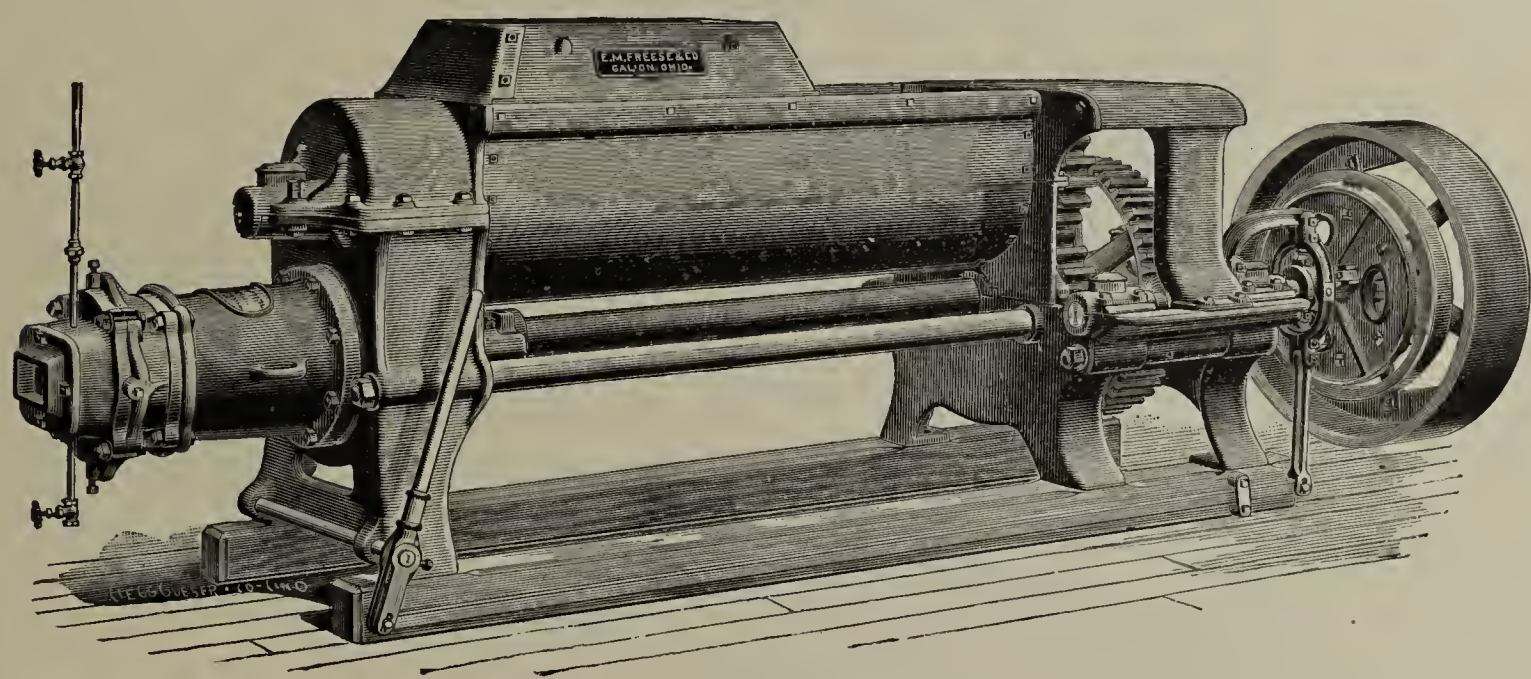
Galion, Ohio.

The Original Union Brick Machines



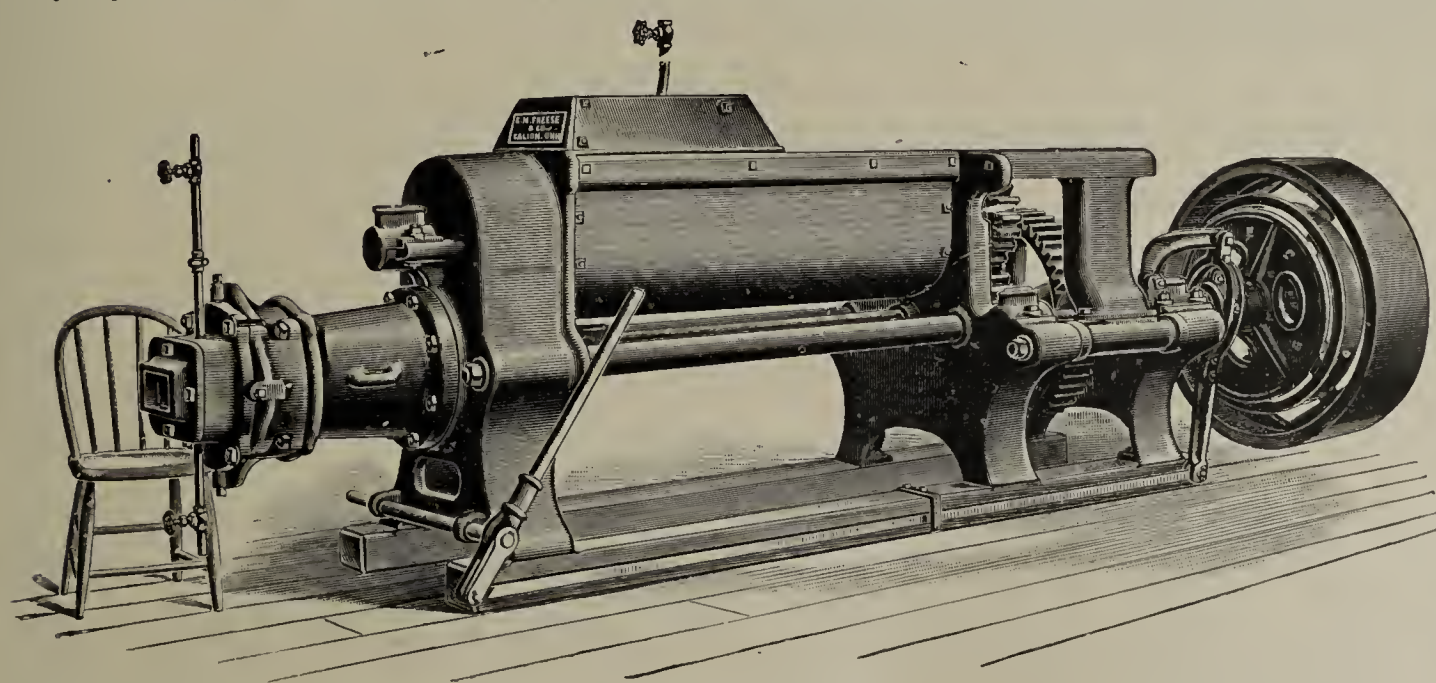
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

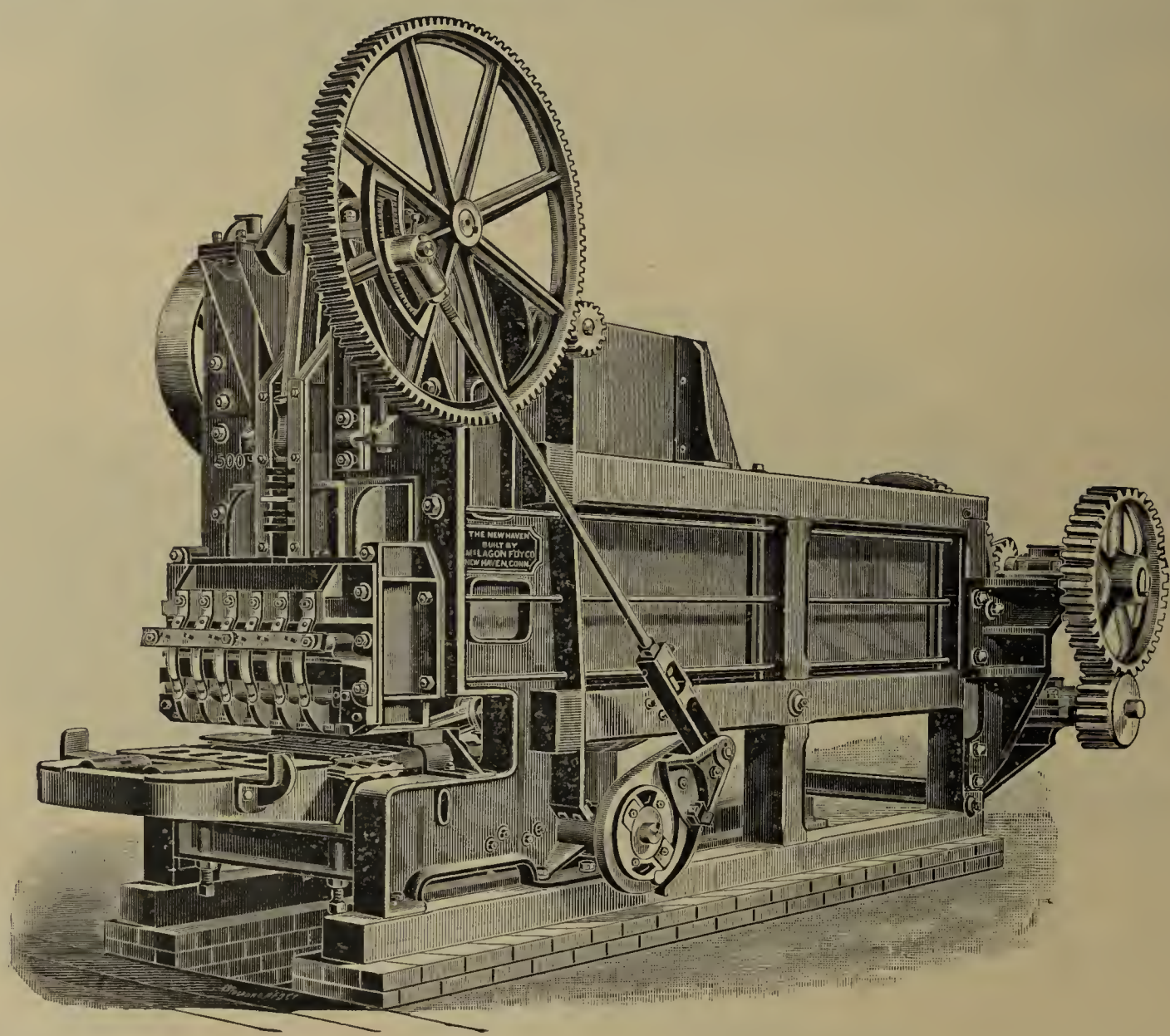
They are a SUCCESS Investigate them.

No separate Pug Mill required.

E. M. FREESE & CO., Galion, Ohio.

"The Lamp of Experience."

Which we published recently and which may be "HAD FOR THE ASKING"
Is full of Interesting Facts for Brickmakers. Note the Quotation below.



AFTER TEN YEARS.

Lebanon, N. H., October 12, 1899.

The EASTERN MACHINERY CO., New Haven, Conn.

Dear Sirs:---I have just COMPLETED MY TENTH YEAR with machine, and IT HAS DONE JUST AS GOOD WORK AS THE FIRST YEAR. It is PERFECTLY SATISFACTORY. Yours,

JASON DENSMORE.

"NEW HAVEN" Brick Machinery is Sold Exclusively on its Merits.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

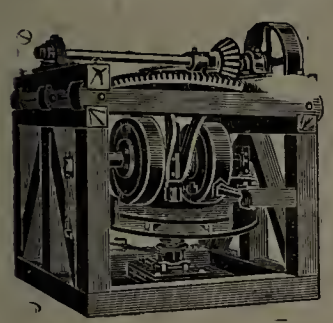
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

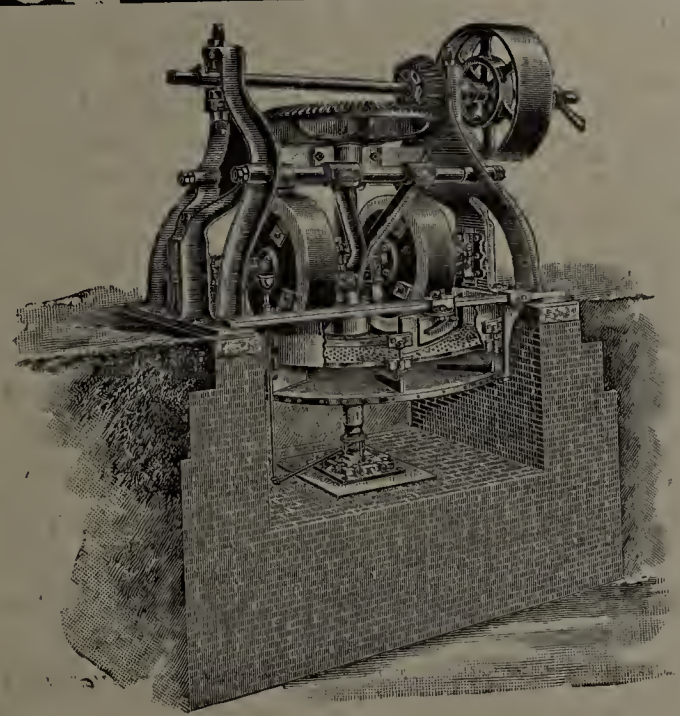
MANUFACTURERS OF

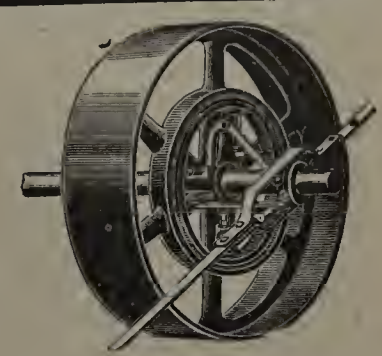
Brick Machinery.

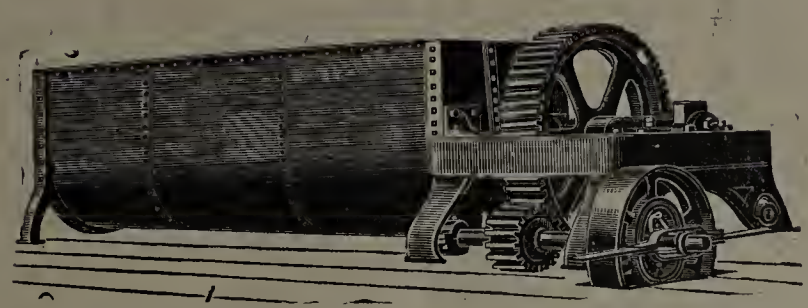
COMPLETE EQUIPMENTS.

Tile Machinery.









Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

A Few Facts

About the
"A. B. C." BRICK DRYER.

It will enable you to run the year round, despite weather conditions. It will enable you to make and dry your brick for 20 cents a thousand or less. It will dry your brick without injury.

Catalogue on request.

American Blower Company,
Detroit, Michigan.

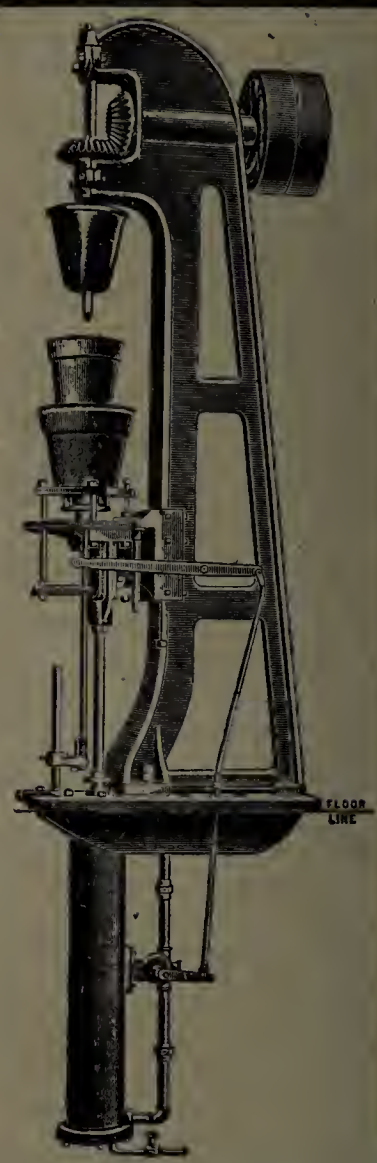
New York. Chicago. London.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS,
OHIO, U. S. A.

MANUFACTURERS OF
ALL KINDS OF

Clayworking Machinery.



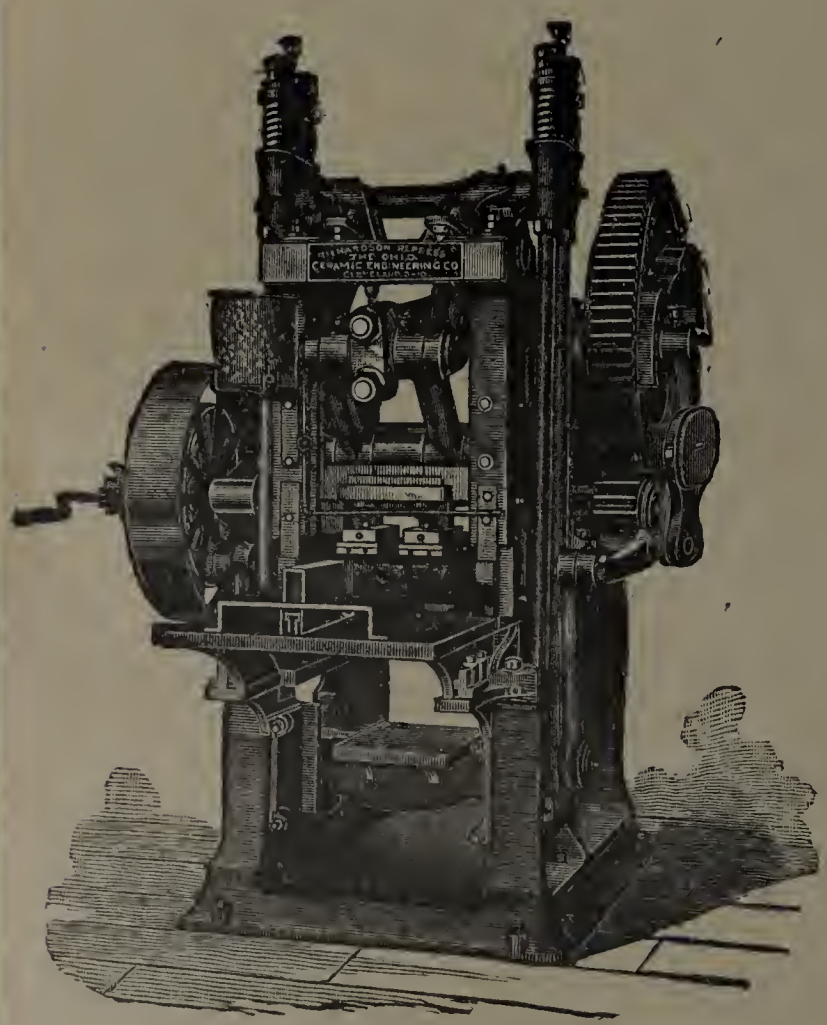
The accompanying cut shows our improved machine for making

Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



The RICHARDSON REPRESS.

If it won't do what we say it will do, Return it.

THESE ARE OUR INSTRUCTIONS TO BUYERS OF THE RICHARDSON REPRESS,

OUR LINE INCLUDES

Two sizes Power Represses.
Two sizes Hand Represses.
Also Hand Presses for Ornamental Brick.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

Table of Contents, Page 43.

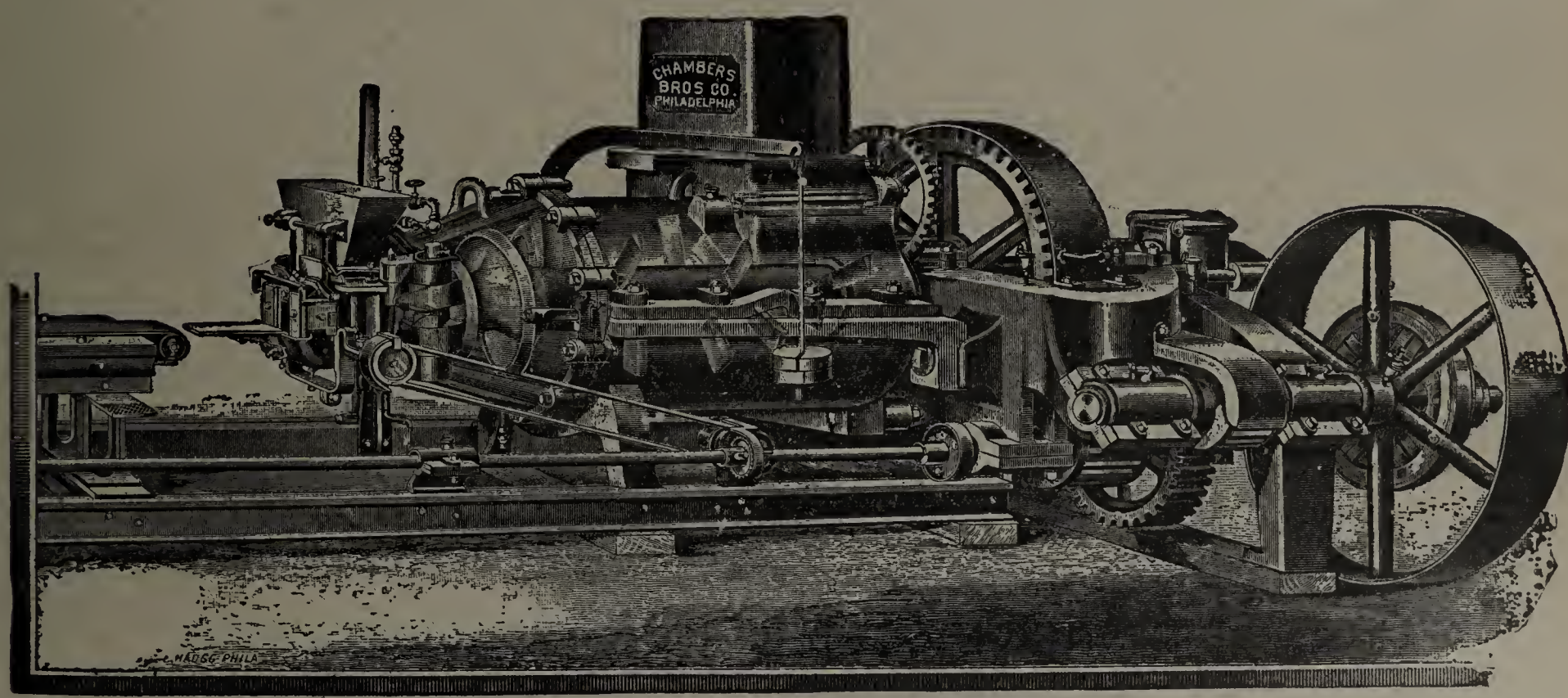
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIV, No. 1. INDIANAPOLIS, IND., JULY, 1900. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We Aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

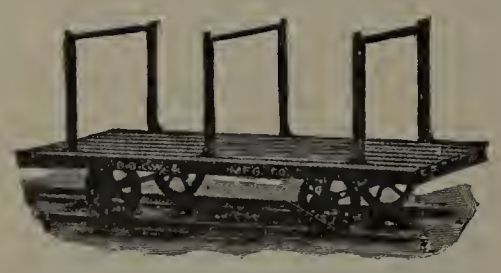
PHILADELPHIA, PA.

The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

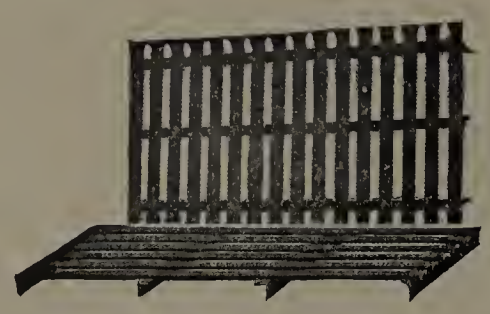
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

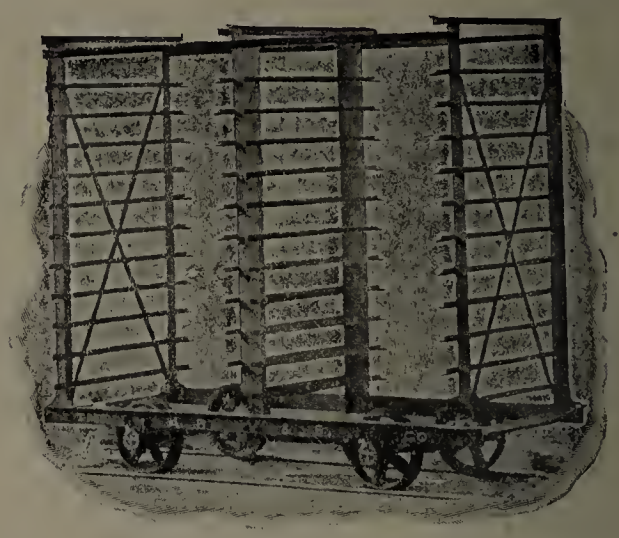
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet 7 inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name.	Page.
American Clay-Working Mach Co, The	8
Anderson Foundry and Mach. Works	4, 5
Chicago Brick Machinery Co.	5 6
Chisholm, Boyd & White Co.	7
Fernholtz Brick Machinery Co. The	9
Progress Press Brick and Machine Co	..
Ross-Keller Brick Machine Co	..

Brick and Tile Machinery.

Name.	Page.
Adrain Brick & Tile Machine Co	65
American Clay-Working Mach Co., The	8, 74
Anderson Foundry and Mach. Works	4, 5 66
Baird and Son, H. C	59
Battenfeld Mfg. Co, The	51
Brewer, H. & Co	75
Chambers Brothers Co	1
Chicago Brick Machinery Co	6
Eastern Machinery Co, The	82
Fate & Co., The J. D	72
Freese, E. M. & Co	80, 81
Henry Martin Brick Mach. Mfg Co, The	77
Hensley, J. W	3
Hortou Mfg Co, The	76
Kells & Sons	59
Leader Mfg. Co, The	67
Madden & Co	58
Ohio Ceramic Engineering Co., The	84
Potts & Co., C. & A	49, 78, 79
Raymond Co., The C. W	44, 45
Stedman Foundry and Machine Works	55
Steele, J. C., & Son	64
Stevenson & Co	83
Wallace Mfg. Co, The	73
Wellington Machine Co, The	47
Wiles Co., A. M. & W. H	64

Brick Kilns and Dryers.

Name.	Page.
Alsip, S. H	57
American Blower Co, The	84
Barron, A. F	68
Bushong, M. M	69
Eudaly, W. A	69
Haigh, H	68
Illinois Supply and Construction Co, The	70
Morrison & Co., R. B	55
New York Blower Co., The	56
Phillips, S. G	57
Pike, E. M	60
Reppell, L. H	68
Swift, F. E	68
Standard Dry Kiln Co, The	10
Yates, Alfred	58

Brick Yard Supplies.

Name.	Page.
Atlas Bolt & Screw Co, The	2
Arnold, D. J. C	66
Borden & Selleck Co	57
Buhl Malleable Company	58
Cleveland Car Co	71
Caldwell & Son Co., H. W	61
Carmichael, T. W	59
Carnell, Geo	64
Coldewe & Co., G	56
Cox, Geo. S	56
Elder & Dunlap	56
Frost Engine Co	53
Harrington & King Perforating Co, The	3
Henry Martin Brick Machine Mfg. Co, The	77
Horton Mfg. Co, The	76
Jeffrey Manufacturing Co, The.	61
Kendall & Flick	..
Marion Steam Shovel Co	67
Main Belting Co	55
Mershon & Co., W. B	60
Newton, A. H	61
Newton A. C	61
Phillips & McLaren	60
Rockwood Mfg. Co, The	58
Turner, Vaughn & Taylor Co	84
Vanduzen Co., The E. W	57
Wells & Hall	59
Williams Patent Crusher and Pulverizer Co	9

Miscellaneous.

Name.	Page.
Burt Manufacturing Co	43
Chesapeake & Ohio R. R	59
Clinton Paving and Building Brick Co., The	63
Coaldale Brick & Tile Co., The	62
Cotton Belt Route	60
Dean Bros. Steam Pump Works	59
DeWit, H	65
Eastern Paving Brick Co	62
Evens & Howard	59
Gabriel & Schall	59
Green & Hunter Brick Co	62
Harper-Norton Shale Brick Co The	62
Indianapolis Engraving and Electro Co	58, 59
Indiana, Decatur & Western	60
Lake Erie & Western	60
Laughlin Mfg. Co	61
McAvoy Vitrified Brick Co	63
New York Brick and Paving Co	62
Osborne, W. R	58
Outing Mfg. Co	65
Preston Brick Co	63
Pennsylvania Line	59
Purington Paving Brick Co, The	63
Sears, Roebuck & Co	58
Terre Haute Brick and Pipe Co.	63
Vandalia Line	61
Wabash Clay Co., The	63
Ads., Small Wanted, For Sale, etc.	

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

Samples or blue prints with prices furnished on request.

THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

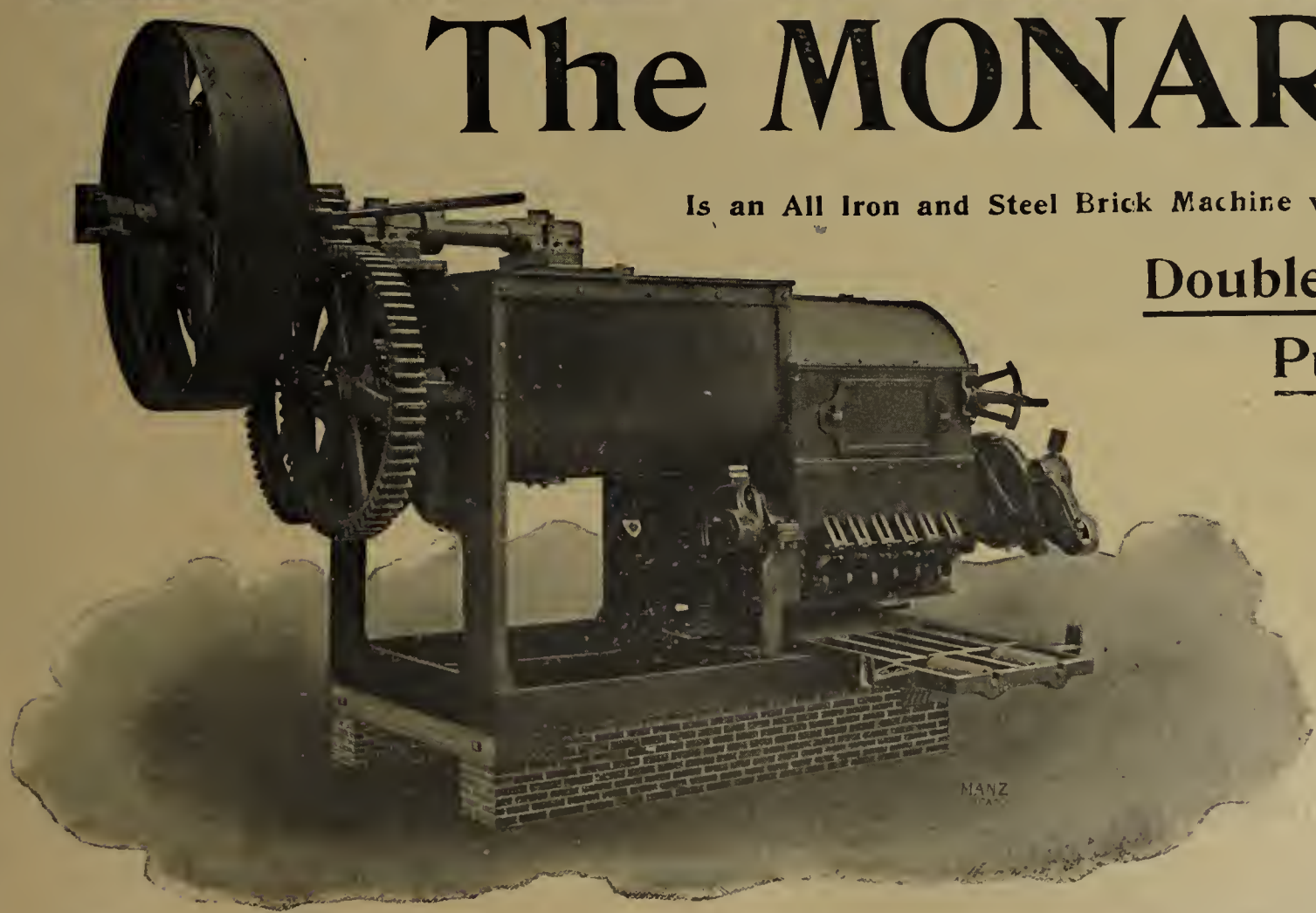
Is an All Iron and Steel Brick Machine with

Double Pug Mill.

• • •

SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •



Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

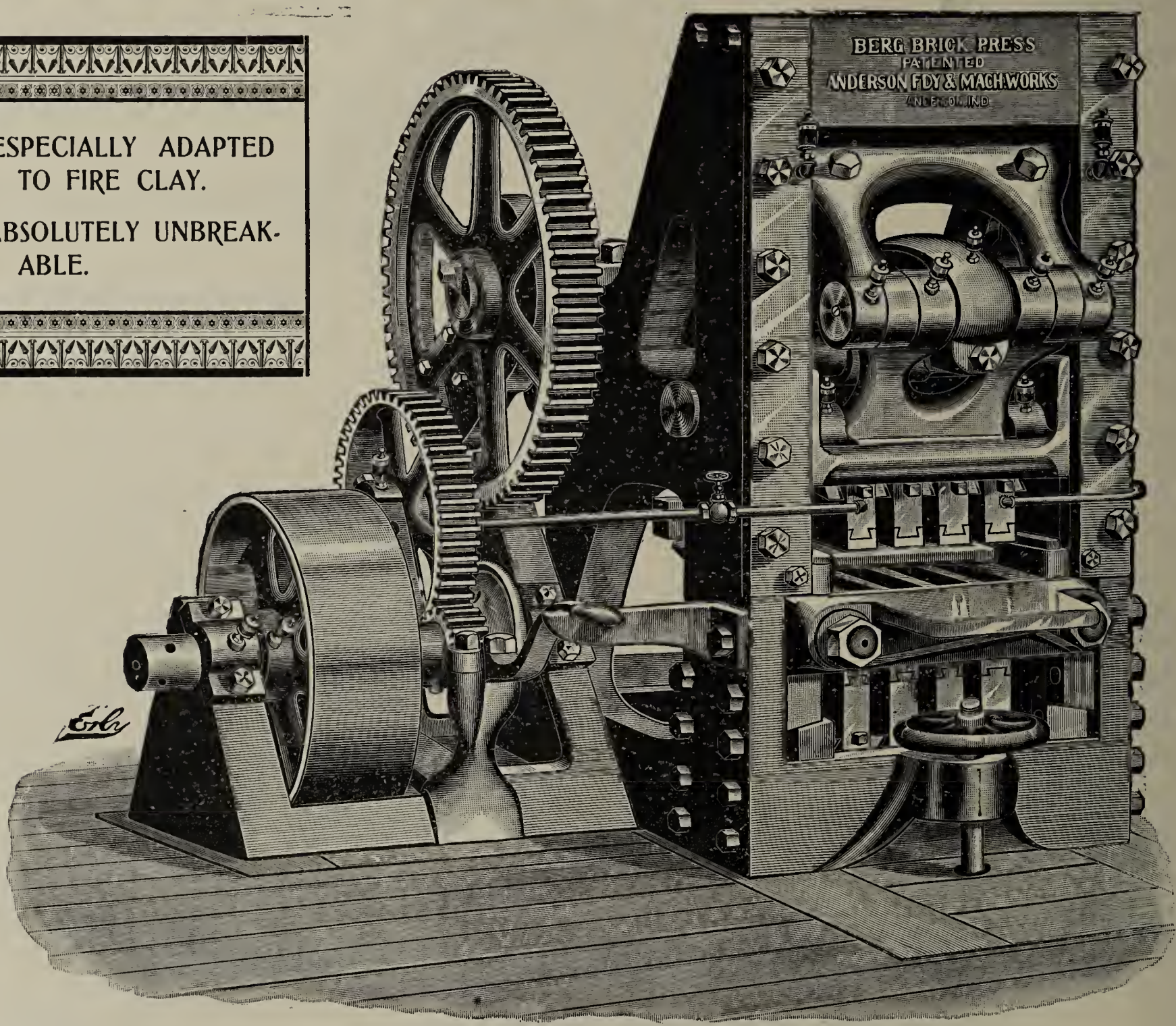
JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown. South Africa.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

WHAT IS IT?

OUR esteemed competitors protest that we do them an injustice; that there is no such thing as **"Bluff"** in their entire make-up.

Therefore it could not possibly have been a **"Bluff"** when they intimated in a recent article in the Clay-Worker (April issue) that Mr. White would tell a different story in Court than in his letter given below. But Mr. White's testimony was taken last week, and is even stronger in our favor than his letter. The United States Court moves slowly, like the mills of the gods, but it also "grinds exceeding fine."

COPY.

September 30, 1899.

John J. Moroney, 225 Dearborn Street, Chicago:

Dear Sir—I have carefully examined the Berg brick press, built by you, and have compared it with all the patents pertaining to brick presses issued to B. C. White and to J. A. Boyd and B. C. White jointly. All of the above patents are owned by the Chisholm, Boyd & White Company, and comprise the only brick press patents owned by said company up to January, 1898. The Boyd brick presses are built under these patents.

I do not find that the Berg press infringes any claim ofany of the above patents, and I see no way in which a suit against the Berg press or its builders or users could be successfully maintained by the owners of the White or Boyd & White patents.

In making this statement I take into consideration the prior state of the art, whereby a number of the claims allowed to White & Boyd and to White are limited to such an extent that they do not cover your machine.

The Boyd brick presses are all machines of my own design and invention in every important particular.

In conducting a long patent litigation involving these patents, I made a thorough examination of all patents relating to brick presses, and am therefore qualified to make the above statements without fear of succesful contradiction.

I am, yours truly,

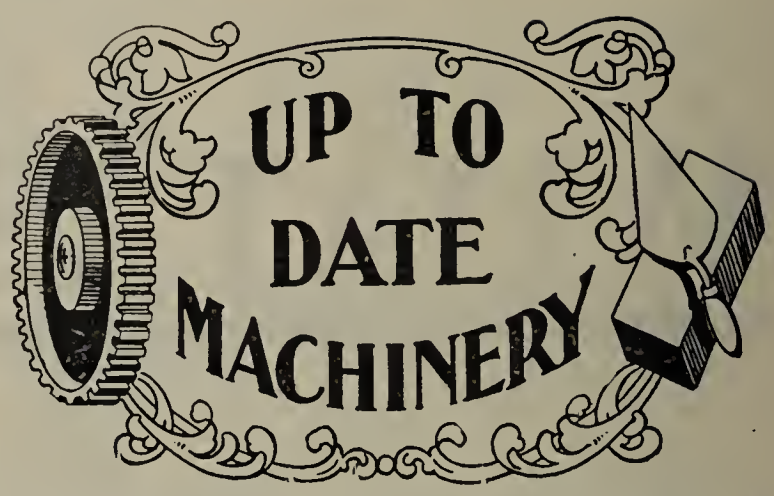
(SIGNED) B. C. WHITE.

IT IS furthest from our intention to do our Esteemed Competitor an injustice. We simply ask every brickmaker to read carefully the above letter from the Inventor of all the Boyd Presses, remembering that it is backed up by sworn testimony; then decide for himself whether a claim of infringement is not—we will not say a "Bluff" since they object to it, but—a matter of Competition rather than Patents.

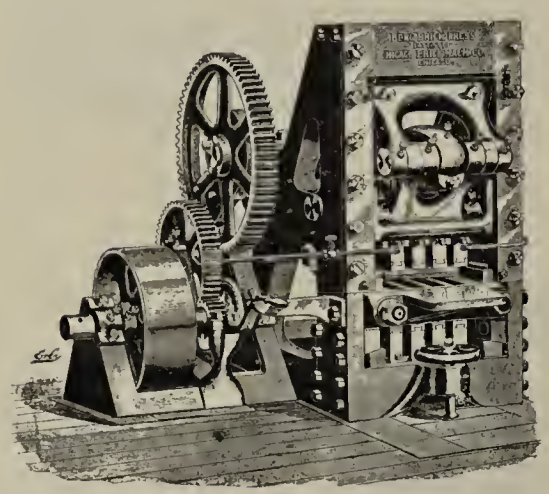
Chicago Brick Machinery Co.,

225 DEARBORN STREET.

When Buying a New Machine



Why not get it strictly **Up-to-Date.** In no other line of industry, excepting perhaps the electrical, has there been so many and such radical improvements during the past few years as in Clayworking Machinery. The dull times have been utilized to good advantage in perfecting our machinery, and the buyer of to-day gets the benefit. Why put in a Back Number, when an Up-to-Date Machine costs no more?

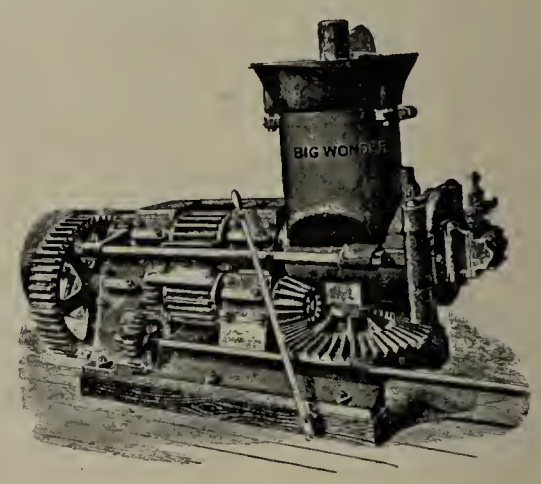


Dry Press Machinery.

Our BERG PRESS is the simplest and strongest of all Dry Presses. Three distinct pressures; absolutely unbreakable in pressing clay. Makes Shape Brick as easily as Standards, and is making in regular work blocks 18x13 inches. Specially adapted to Fire Brick and Fire Clay Shapes. **Fully Guaranteed** in every respect.

Send for Special Dry Press Circular.

Stiff Clay Machinery.

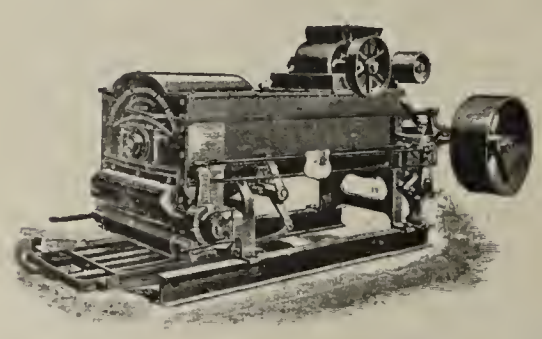


Our WONDER BRICK & TILE MACHINE is the most modern and improved type of Auger Machinery. Turns clay at Right Angles while in motion, breaking up and destroying laminations. Specially designed dies and augers to prevent laminations. Works many clays that cannot be worked on other auger machines.

Built in four sizes, capacities up to 100,000 per day. Makes Drain Tile equally well and equally rapidly.

Full Line of Cutting Tables, Crushers and Stone Separators, Pug-Mills, etc., adapted to all kinds of clay.

Send for Special Illustrated Catalogue.



Soft Clay Machinery.

Our HORIZONTAL COMBINATION MACHINE is the latest and highest development of the Soft Clay System for making Sand Molded Brick. Works clay direct from bank, doing away with all soak pits and tempering.

We also have Upright Machines for working clay that has previously been soaked, and Horse Power Machines for small yards.

CHICAGO BRICK MACHINERY CO.,

Send for Illustrated Catalogue. **225 Dearborn Street, CHICAGO, ILL.**

A BIG BLUFF?
OH NO!

We claim the Berg Press does infringe our Patents. In that Press are some devices secured to us as new and original, by our Letters Patent. This is an admitted fact. Those claims in our Patents must be declared "VOID," else the makers and users of the Berg Press must be deemed guilty of infringement.

Now the fact is, we have brought suit against the Makers of the Berg Press. ═══════ **That is NO BLUFF.**

The evidence establishing our "*prima facie* case" has already been taken, ═══════ **and that is NO BLUFF.**

When the Courts have decided our patents to be "GOOD" and the Berg Press an "infringement," as we honestly believe they will, *the brickmaker* who has been talked into buying Berg's Pitman-Lever Press will then realize full well that ═══════ **we made NO BLUFF.**

If each purchaser withholds payment until this suit is decided, or takes a Bond for the money,—a Bond that is good, sure and collectible, he will make no mistake. That will be **A GOOD BLUFF,** one which the Makers and Sellers may not find agreeable "to call."

We have started out to protect what we believe to be our just and equitable rights, and we propose to fight it out on these lines ═══════ **and that is NO BLUFF.**

LASTLY.—We have also lately brought suit in the U. S. Court against the Sales Agents of the Berg's Press, in Chicago, ═══════ **and that is NO BLUFF either.**

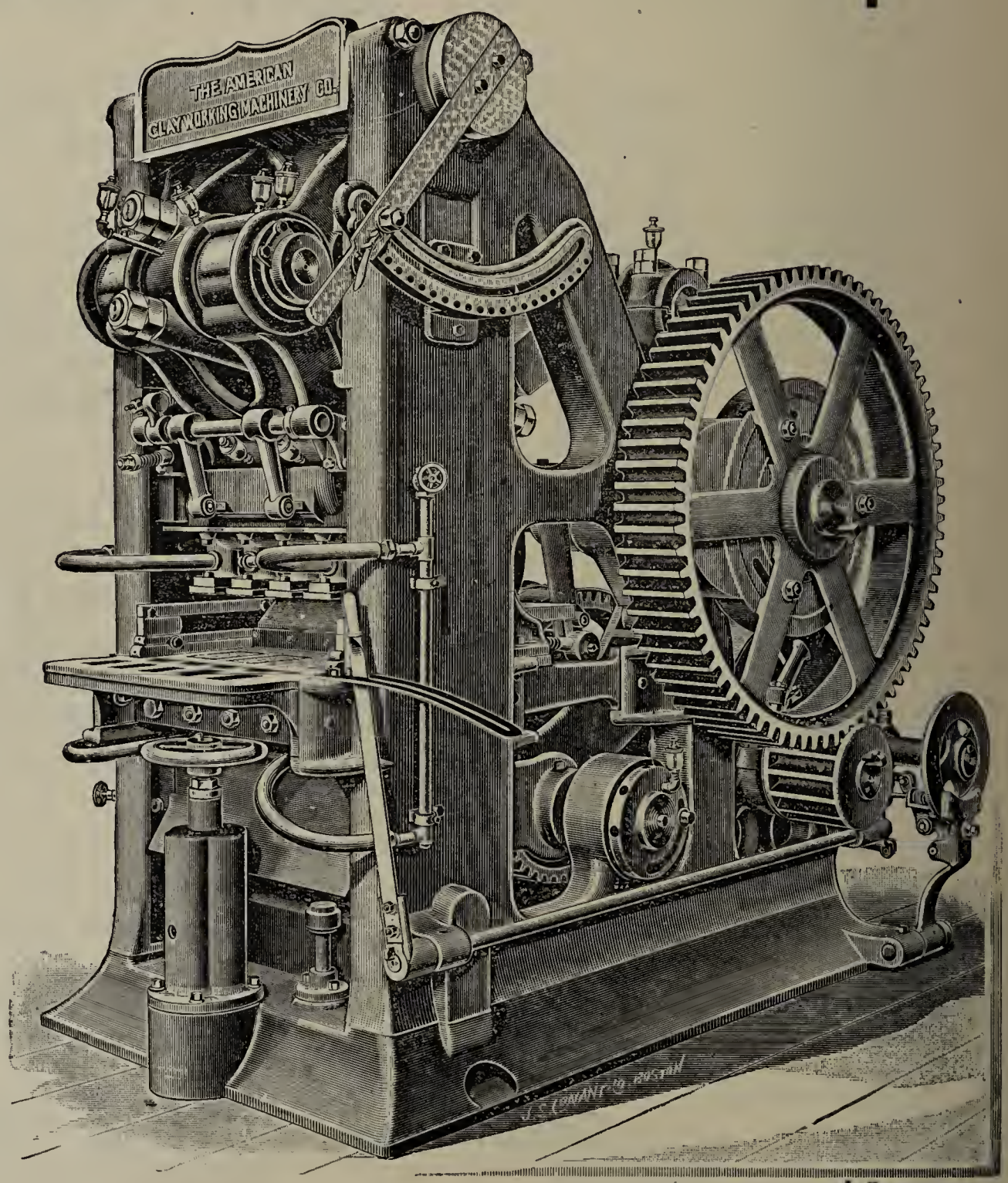
CHISHOLM, BOYD & WHITE CO.
CHICAGO.

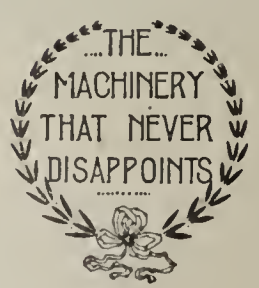
July 1, 1900

It's Up To You!

Built Right.
Run Right.

THE first requisite of a successful machine is the principle on which it works. No matter how good the making or material, no matter how alluring the price may be, if the principle is not good it is an undesirable machine, which will eventually land its owner in bankruptcy or the mad house and itself in the scrap heap. An investment in such machinery is little better than criminal. Look thoroughly into the market before you buy, then if you do not buy our machinery your misfortune will be an error of judgment only. We have kept a constant step with the clay business for half a century. The same exacting care which has kept us in the front rank of manufacturers is keeping us in the lead. Some of our most popular machinery is our dry press line. They're "Built Right and Run Right." If you are in the market write us. We build dry press, stiff mud and soft mud machines. Our complete catalogue for the asking.





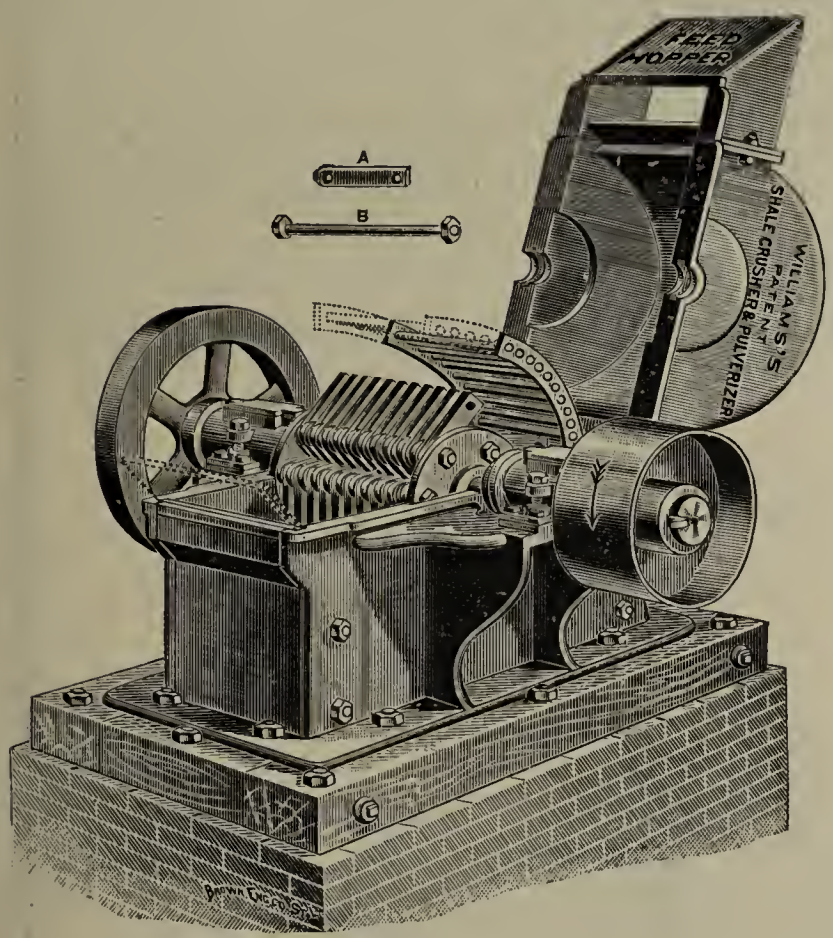
The American Clay-Working Machinery Co.,

NEW YORK OFFICE:
39 and 41 Cortlandt Street.

BUCYRUS, OHIO, U. S. A.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

SUBURBAN BRICK CO.

WHEELING, W. VA., June 18, 1900.

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO.,
St Louis, Mo.

Gentlemen:—Answering your favor of the 12th inst. We are pleased to say that the Shale reducing machine, put in our factory at Martins' Ferry, Ohio, has done good work, and in sufficient quantity for our needs, and has been very satisfactory in practice.

We have had no repairs or expense upon the machine, except for a set of new knives, during the past year, and this fact alone, when compared with the cost of keeping a grinding pan of the same capacity in repair, ought to be all the encomium or recommendation your machine needs to commend it to practical people.

Very truly yours,
SUBURBAN BRICK CO.,
Per B. F. Hodgman, Sec'y.

FOR FURTHER INFORMATION WRITE TO

The Williams Patent Crusher & Pulverizer Co.,

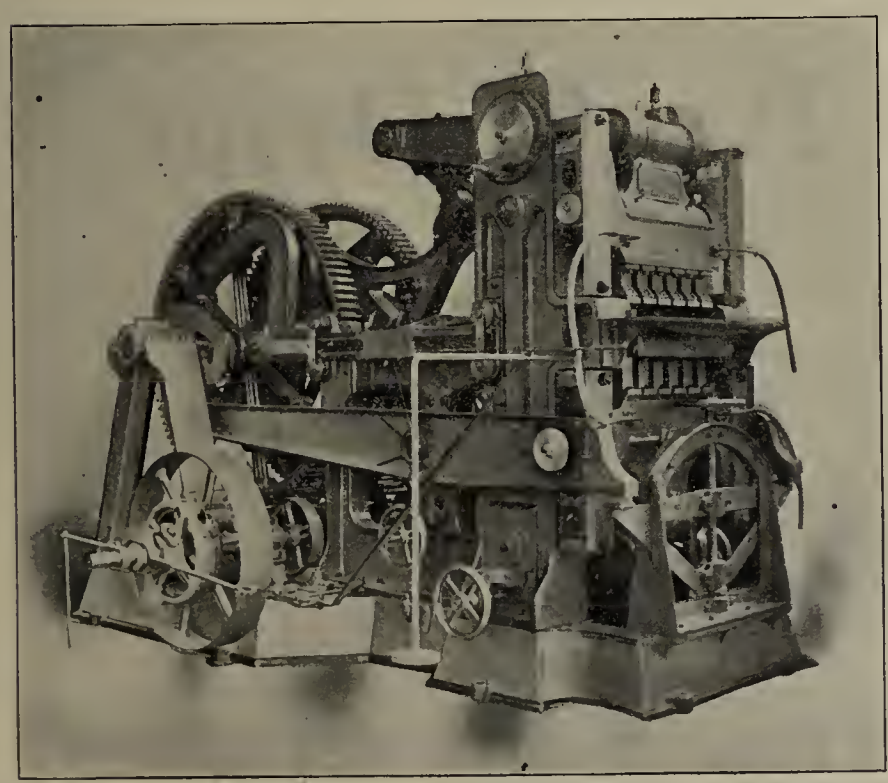
2701, 2703, 2705 and 2707 North Broadway,

ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Singer Building.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, SIMPLICITY and SERVICE.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market.

All parts subject to strain are made of the best Bessemer steel.

Fitted with the Fernholtz Mold Box. Undoubtedly the leader.

We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer**, and the **Fernholtz Clay Mixer**, in our own factory.

Dealers in Brickyard Supplies.

PARIS, TEXAS, March 13, 1900.

THE FERNHOLTZ BRICK MACHINERY CO., St. Louis, Mo.

Gentlemen:—We are in receipt of your inquiry in regard to our Brick Machine, and in reply beg to say that we have been operating machine regularly for five years, and the repairs on same have been about $50.

We consider this a very good record and will take pleasure in recommending it to anyone who is interested in Brick Machinery.

Very truly yours.
CARTER & ROLLINS.
Per Carter.

Further Information on Application.

The Fernholtz Brick Machinery Co.,

CABLE ADDRESS "FERNBRICK."
WESTERN UNION CODE.

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

Mexico Agent: INTERNATIONAL SUPPLY COMPANY, City of Mexico, Mexico.

What Brick Makers Want:

Is a Drier that will do the **best** work; do it the **quickest;** do it with the **least amount** of labor, and at a **minimum expense** for operation.

What We Want:

Is that manufacturers of Clay Products of **every kind,** examine **The Standard Drier;** investigate its possibilities, and **compare its record** with any other Drier in the World. That's all.

The Standard Brick Drier

We know, has no superior, and we doubt if it is equalled by **any other** Drier on earth. It will dry **any kind** of clay; in **any form;** do it **quickly** and **perfectly,** and at **least cost.** What more can you ask? These claims we are prepared to demonstrate to your satisfaction. Write for full particulars and testimonials.

CATALOG FOR THE ASKING.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., JULY, 1900. No. 1.

WRITTEN FOR THE CLAY-WORKER.

THE ROYAL SAXON PORCELAIN MANUFACTORY.

Dresden China—Where and How It Is Made.

THE EUROPEAN TOWN longest and best known for the development and manufacture of porcelain is the ancient episcopal seat of Meissen, Saxony, on the river Elbe; the art and industrial products of which reach the markets of the world. Here, in the immense governmental buildings in the Trebischthal, is made nearly all the so-called "Dresden" china; (very little, if any, chinaware being made in Dresden.)

The name "Dresden china" was first applied only to the productions of the royal factory at Meissen, which were sold at the government agency, in 1714. There has been no china at all made in Dresden up to date (November, 1899); but numbers of Dresden dealers buy white china in order to have it decorated in Dresden and sold under the name of "Dresden china."

In the sixteenth century the Portuguese traders brought from China some fine examples of porcelain; and towards the end of the seventeenth there appeared the "vieux Sevres" (soft) porcelain. In 1704 Johann Friedrich Bottger, of Dresden, in connection with the chemist, Tschirnhauser, made in the latter town, from a red clay found in Okrilla, near Meissen, a reddish brown to dark brown ware, and five years later discovered and used "kaolin," or true china clay, from Aue (Schneeberg), from which he made a milk-white product, which surpassed the French and nearly equaled the Japanese and Chinese product, and has ever since been known as "hard poreclain." The factory proper was established in 1710, in that famous architectural mountain monument, the Albrechtsburg, overlooking the town of Meissen; the elector, August II (called "the strong"), being encourager and proprietor of the enterprise. During nine years, under Bottger, the establishment was maintained at great expense, its principal object and result being the production of tableware for the great elector. Later, under better financial management, its products were sold at the great annual Leipzig fair and elsewhere, and a profit has been realized nearly every year since then. For a long time the secret, so carefully guarded, was preserved; but at last it got into the hands of outsiders, and rival governments established factories of their own.

Boettger Showing his Discovery or Invention of Hard Porcelain to August der Starke, Kurfuerst of Saxony. From the Mural Painting in the Albrechtsburg, Meissen.

The first porcelain clay used in Meissen was that from Aue (Schneeberg), not far off. It gave objects of a reddish hue, and is still employed where details are very tender. About 1756, however, the white ware was substituted for red as a regular article of manufacture.

But we will now commence our tour through the immense quadrangle of buildings erected by the state in 1863. The works are open to all who pay the guide a fee of one mark (24 cents), and the register shows daily visitors from all corners of the civilized world.

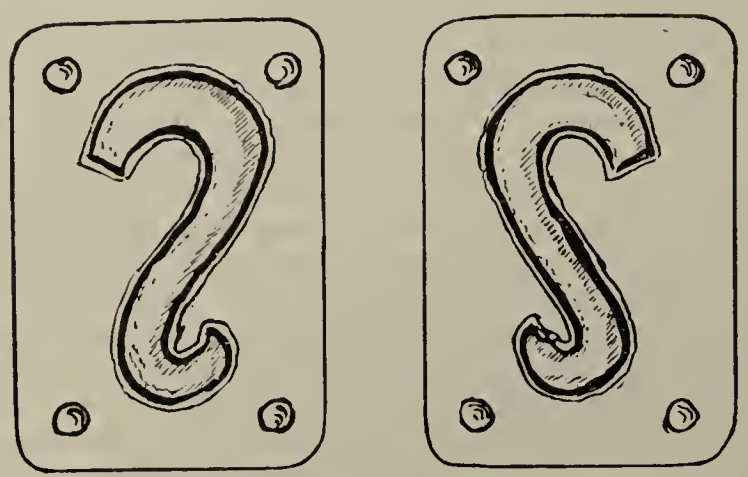
The "kaolin," or china clay proper, now comes from the villages of Seilitz and Sornzig, near Mugeln, Saxony. Prior to 1840 it was obtained from Aue (Schneeberg), in the Saxon Erzegebirge. It contains, as received at the works, about 70 per cent. of sand, which must be removed by repeated washings and passages through successively finer sieves and floatings and settlings in deep tanks with water. (These tanks are built of brick, with cement facing, and are the finest

cement work I have seen in many a day.) In them the fine clay settles to the bottom, and the water is drawn off through pipes above.

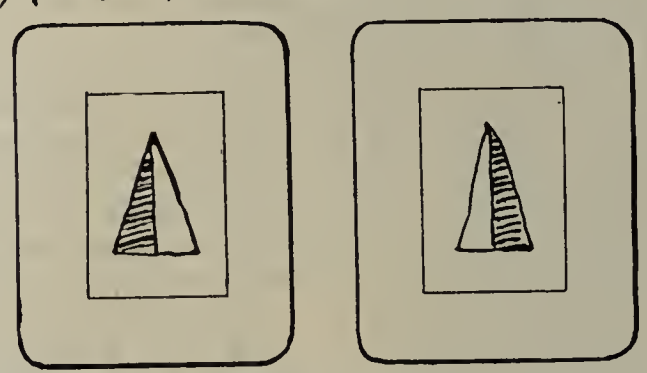
The kaolin must be mixed with a certain proportion of feldspar to make it fusible; the proportion of the latter varying with the character of the desired ware or of the pieces to be made, but in all cases being less than in the ware from other factories.

The feldspar comes from Norway. After calcining it is hammer-sorted, to get rid of mechanical impurities; then pulverized in a tumbling-barrel supplied with internally-projecting slabs of porcelain and in which a number of porcelain balls aid in effecting the comminution. It is then ground in upper-running mills between disks of sandstone, the entire mill being submerged in a water tank.

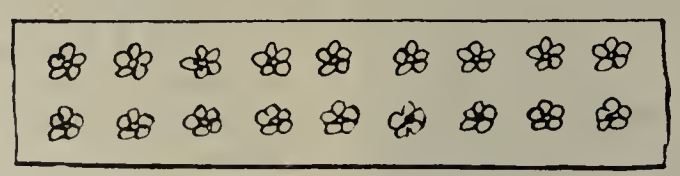
The mixture of kaolin, feldspar and water is then pumped into a filter press, in which the water is nearly all extracted,



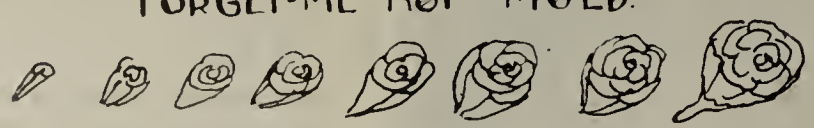
MOLD FOR COFFEE-POT HANDLE



MOLD FOR CHOCOLATE-POT NOSE



"FORGET-ME-NOT" MOLD.



BUILDING UP A ROSE

leaving slabs of a stiff, plastic mass. These are then "kneaded" thoroughly to effect intimate mixture and extract the air. As devised by Faure, of Sevres, the material, cut into strips, which are laid in X-form on a table, is passed over again and again by slightly conical rollers, or wide wheels at each end of a horizontal axis, revolving about a vertical one. The "chasers" used in this process are not unlike the Spanish "arrastra," with the addition of side rolls following up the others, so as to build up the mass into a ring instead of letting it spread all over the bed.

After kneading, the mass is put into cement tanks or bins, to ferment from three to ten months;* this process greatly improving its lightness and plasticity.

The material being duly fermented is taken out of the tanks or bins and cut into large blocks, which are worked by hand to exclude bubbles. These blocks are then ready for the former.

(Before, however, following this material any further I should say that the quartz used in the glaze comes from Norway; the limestone from Pirna, on the Elbe. These materials are calcined, hammer-sorted, very finely ground and then "floated," but are not worked up under the chasers, as they are used only in the state of an emulsion or "slip.")

We now have a plastic white mass which may be "thrown" on the potter's lathe or wheel, or modeled by the hand and by tools, or pressed in molds, according to the form of object desired.

Round articles, such as cups, are "thrown" by hand on the wheel into approximate shape, and then pressed in plaster of Paris molds, or on plaster forms, to exact and uniform size and shape, and at the same time given their embossing if any be required. The porous plaster quickly absorbs the excess of water and leaves the articles comparatively easily handled.

The wheel is that of Scriptural days, turned by the potter's foot. Articles like plates shrink about 1-10 in diameter when on the plaster forms or molds, in which they are usually allowed to dry over night. When removed, any rough burr is removed by a thin steel scraper. The employes all work by the piece. One man will turn out 130 to 150 plates per day of 10 hours.

Articles which are not circular in plan or cross section (as, say rectangular inkstand trays) are formed without "throwing," on plaster molds. The block of clay (I speak of it as "clay," although it is really "composition") is laid on a cloth, and a thin slice cut off the bottom with a cord. The block is then lifted on to another cloth, and the first piece and the thin slice of clay are taken up in the workman's hands, and skillfully reversed over the mold or form, on which it is well beaten down, without removing the cloth until it has completely covered the mold. Then the cloth is removed and the surface (which will be the bottom of the article) smoothed with a wet sponge.

Parts like handles of cups, and of trays, are made separately in plaster molds, and attached, while both pieces are soft, by simply touching the junction with thin "kaolin" slip, and pressing the two parts together. The molds have conical down-like projections to insure proper presentation and closing, and each of two contracting parts have a groove cut around the "print" proper, to receive the excess of clay. Some complicated designs have forty or fifty separate pieces; and some pieces have three-part, four-part, or six-part molds. The spout of a chocolate-pot, for example, has a mold consisting of two blocks, doweled together, and one of which has projecting from its face the "core."

To free the outside, which has relief decorations, it is necessary that the outer mold be in three parts, and these are confined in a recess in the other half of the mold, so that when the half with the core is removed the three parts bearing against it outside may be pressed out and then separated.

The cheaper grades of flowers are made by pressing clay into recesses in plaster blocks; a dozen or more being made at once by thumb of spatula; and the separate flowers are attached, when desired, to the object (as a wreath) being built up.

As this, however, gives uniformity of size, those for the more expensive pieces are made separately by hand, no two alike. Thus a rose is made by smashing with the thumb small pellets of clay and rolling them up successively so as to build up a flower. A forget-me-not is made by rolling up a small cyinder, forming a cup in its end, splitting the cup into five lobes, and forming each petal separately.

To make a mold, the original design is first made in modeling clay, this being the most difficult and important task. From this, then, is made a plaster of Paris mold in two or more (sometimes fifty) parts, as many as are necessary to

*The Chinese let their clay ferment from two to three years.

make the separate pieces "draw" from the model. This will insure that the separate pieces of the cast will draw properly from the molds. The plaster molds are wet with Castile soap and water to prevent them from sticking together and to enable the china clay to free easily. Both the modeler and the "bossirer" (embosser or toucher-up) must know their material well.

For oval dishes, etc., the original piece is made in an elliptic or eccentric lathe.

Lace, which is a specialty here, is made in two manners. The first is by saturating real lace fabric with china clay "slip" and using it on the figures. In the firing, the fabric burns out, leaving its exact counterpart in porcelain. The other way is to build it up with infinite patience, by letting fall, in place, drops of china clay "slip." The water is absorbed by the general mass, and the clay remains in delicate points and pearls. For this work of patience the more delicate hands of women are best suited.

Incised work is where the sides of vases, the borders of plates, etc., are given a basket-like appearance is given in a mold its relief decoration and the outlines of the places which are to be incised, and then the latter are cut out with narrow knives. (In factories where cheap ware is made, such work is stamped out, but the effect thus gained is not so artistic.)

Before glazing articles are well dried and then given their first or partial firing in a kiln compartment heated to 800 degrees to 900 degrees C. (say 1,472 degrees to 1,652 degrees F). They emerge much shrunken (one-tenth the diameter being lost), very porous and quite brittle. They are brought on boards on the laborers' heads to the glazing room where they are dipped in a milky slip or emulsion of quartz, kaolin and lime. At once every trace of underglaze color which they may have received (this will be spoken of further on) vanishes, and there appears a thin floury crust, which in the second firing melts and becomes transparent, letting the colors reappear. Any spots which have not been properly covered with the slip in dipping are touched up, then the articles are ready for the kiln. Occasionally articles require, by reason of imperfect glazing, to be twiced glazed; and this may be done either by dipping or locally with a brush.

The kilns, which are seven in number, are cylindrical affairs, each being divided into three stories, the lower of which receives the most heat. In the upper the first firing, or "verglubrand," is given; in the lower, the "gutbrand," or final firing under a temperature of 1,600 degrees to 1,800 degrees, equal to 2,912 to 3,272 degrees F., which is a much higher temperature than is reached in any other porcelain factory. The Limoges and Carlsbad wares are fired at much lower temperature. The final firing takes for small pieces about 22 hours; the cooling down about three days. Large pieces are heated and cooled more slowly; but in all cases the temperature is the same.

Some of the kilns are fired from five sides. The fuel is Bohemian brown coal (or lignite) and the draft goes first down at the sides, then up, then down through the center, being let off at the bottom through long horizontal flues to the chimney or "stack."

When the kiln-door is bricked up there is left a hole which is easily opened and through which trial pieces are withdrawn from time to time to test the temperature and the thoroughness of the firing.

As it would not be permissible to have the flames or combustion gases touch the porcelain objects, each one is inclosed separately in a "seggar" or fire clay box; these boxes being piled high in the kilns, all of a size in a pile, like a column, and the seggars being stacked as closely together as possible. The clay from the seggars comes from Lothheim, near Meissen.

The Royal Porcelain Factory, Meissen.

Two articles are never put in one seggar, as in many works, especially with plates, etc.; the result of such doubling up always being to show on each object the prints of the three points of the porcelain double tripods which separate the pieces.

What is known as "half-baked" ware is heated to only about 900 degrees C., equals, say 1,632 degrees F. This ware is given the decorations in cobalt blue and one or two other colors, which are the only ones that are put on before glazing.

Although many classical figures remain in faultless white, the largest proportion of objects here manufactured are decorated in polychrome. To the color decoration thirty rooms are devoted, and 180 persons find employment in this work. A

sharp odor of turpentine greets the visitor as he enters this part of the establishment.

Here we must recognize a sharp division of the work into two classes: "overglaze" and "underglaze;" terms which are self-explanatory. The underglaze ware is principally in conventional designs in cobalt blue, on articles for domestic use, and is properly trade ware. Much of it, however, rises to the level of high art and presses into its service a knowledge of drawing and painting, chemistry and physics. It may be divided into four classes: (1) The mere decoration of figures, handles, etc; (2) ordinary flower painting; (3) fine flower painting, and (4) high art work. In underglaze work the result is more durable, the colors firing at the same temperature as the glaze, and uniting therewith; but overglaze work permits a tender blending of colors impossible with the other method.

In the decoration of half-baked plates, etc.. with the Meissen "onion pattern" and others requiring or permitting almost absolute uniformity, there are employed stencils with slight perforations through which fine charcoal is lightly dusted, giving the outlines which are to be followed by the brush. The cobalt appears green at first, but comes out deep, clear blue, in the firing. After the decoration the plates, etc., are given the trade-mark, and then dipped and fired for the second time.

All the paints used are metallic. For red there are employed salts of gold and iron; for yellow, antimony; for green, chronium and copper, and for blue, cobalt. Violet is got by mixtures.

In painting, some colors require to be first "grounded," then fired, then repainted; sufficient depth being thus secured.

Gold paint is made by reducing pure gold by aqua regia and mixing the dried precipitate with a flux to give flexibility, the mass being then thinned with oil of turpentine. Pure gold decoration is brown both before and after firing, and requires burnishing with agate or with bloodstone.

"Mock-leaf" gold, however, requires no burnishing, and is used on cheap ware.

The manufactory prepares its own colors in a laboratory in which, while the object of research and production is not gold, as in Bottger's time, as much patience and care are bestowed as though the philosopher's stone, or its kindred wonders, were the desired end and aim. There are special kilns in the laboratory for enamel making; and this establishment sells its enamel to private manufacturers wishing them.

There are used 77 different "enamel" or "soft-firing" colors, and 30 to 40 "sharp-firing;" this being the greatest variety used in any establishment. Some colors, as a spinach yellow, and an irridescent copper (the latter a rediscovery after about a century's loss), are known in no other factory. Of recent years, platinum is used where steel, silver, etc., have to be represented. Formerly silver was used, but as this blackens with sulphur, platinum has been substituted with most charming effect, being prepared and used just as gold is.

But I must explain the distinction between "soft-firing" and "sharp-firing" colors. The former are enamels, or colored glasses, melting at about 600 degrees C., and permitting the use of soft china, such as is made in other establishments, but the "sharp-firing" colors are made of ground porcelain with suitable pigment, and fuse only at 1,100 degrees C., so that they cannot be used on soft or easily baked ware.

Among the colors and effects which Meissen has as its specialties are its pink, high red, brown-yellow, transparent gold, enamel blue, sky-blue, and gold and silver on royal blue ground. Among its best known and most imitated patterns are the "onion," the "German vine leaf" and the "Karten muster" or card party.

Meissen on the Elbe River, Saxony, Germany, the Albrechtsburg and Cathedral to the Right.

For a long time the only sharp-firing colors known were cobalt for blue, chrome oxide for green and uranium oxide with chrome oxide for black. More recently platinum and iridium compounds have been applied, the latter for black. early all the pigments change their colors in firing, thus gold at first is brown.

All the work done is hand work, this being the only establishment in the world which adheres to this rule and practice.

What is known as "Limoges" painting is done with white enamel on a solid royal blue background; but while the effect is beautiful it is very poor compared with that produced by the sharp-firing colors.

This latter work, in which the finely ground porcelain of various shades is the pigment, requires much more skillful artists. Of the 400 persons in the establishment who can draw,

only about twelve are capable of doing this work. Shadows are produced by laying on the colors less thickly, so that the dark background shows through, no other manner is permissible. While the "Limoges" style may be imitated, this method, called "pate sur pate" can not.

For this work, the plaque or other object is first half, or less than half, baked, then the background is put on, then the design, the plaque is next fully fired and then the enamel colors are put on, if any are used. Lastly the gold is laid on and fired, and then often engraved if especially rich effects are desired.

In the art department, proper, the designs are principally after the subjects or styles of Watteau, Bouchetz, Lancres, etc., in graceful forms, tender harmonizing colors, and charming compositions, the Children of the Renaissance, shepherds and shepherdesses of high degree, miniature cavaliers and ladies, gods and goddesses, and the like. One also notes purely classical designs, as Apollo and the Muses, and grotesques, such as Count Bruhl's tailor, and a concert group with 33 apes as musicians. Recent tendencies, however, in painted decoration, are toward higher colors, which are permitted by the faultless purity and whiteness of the Meissen ware, and more recent painters, as Defregger, are drawn on for cabinet work, while Venus and Diana, Bacchus and his crew are reproduced in infinite variety. The finer paintings of the world renowned Dresden gallery are copied in miniature with exquisite fidelity, so that Douw and Matsius, Wouverman and Brouwer, with Holbein and Raphael, reach thousands of homes in imperishable colors. The medallion work leaves nothing to be desired, and is in no way behind the most delicate miniature painting.

Kaendler created the Rococo shapes and designs, and Acier the pastoral.

An excellent example of the best grade of artistic work in the Limoges style is a vase 28 inches high, with the "Alexander" procession, after Thorwaldsen's celebrated frieze, done in white on a royal blue ground.

The establishment is now reproducing the goods which Bottger first made, a dark, rich brown ware made from the clay of the neighborhood, which is rich in iron. (Bottger accidentally discovered that the fine white clay with which he powdered his wig was entirely free from iron, and gave pure white ware. From this lucky accident came the marvelous porcelains of modern Europe.)

Meissen now makes the famous craquele ware, of which the Chinese and Japanese for so many centuries guarded the secret. In this the glaze is covered with a fine network of cracks. This is accomplished by using a glaze which cools sooner than the ware beneath, the ensuing cracks are filled in with a liquid color, and the articles refired.

The principal trade mark of the manufactory is two crossed swords or napiers. During the Marcolini period, a century ago, there was a star under their handles. The mark is much imitated by unscrupulous manufacturers, against many of whom suits are pending.

"Second quality commercial goods," as table ware, have the trade mark scratched through thus:

Of art work five grades are recognized. The first and second are unscratched, the third, fourth and fifth have one, two and three scratches through the trade mark, respectively.

As a rule there is but one quality or grade in the decoration or in the ware itself. Differences in both occur, but usually from damages in firing (spots of other minerals, vapors of metals, etc.) and in handling. These damages cause grading, which is indicated as follows:

For dinner ware, "seconds" have two scratches through the crossed swords.

For art china, as groups, clocks, candelabra, and all kinds of fine modeled set ware, first and second qualities have no special mark, "thirds," "fourths" and "fifths" having one, two and three scratches, respectively, below the crossed swords.

There have been produced here about one million different kinds of articles, of various degrees of cost and complication. One piece made for Pope Urban cost $13,000, for the model alone, and to-day the model would probably cost $20,000.

There have been produced here about 1,500,000 different kinds of articles, of various degrees of cost and complication. One group of the very largest size ever made was executed in the middle of the last century, for one of the popes. It represented the crucifixion, and the cost of the model, at the present rate of wages, would be not less than $20,000.

The factory and its stores carry about $1,000,000 worth of stock. While the governmental porcelain manufactories of Berlin and Sevres are run at a loss, this one yields to the state a profit which has recently amounted to more than $100,000 yearly, on an annual production of nearly $500,000.

One characteristic of the place is the great length of service of those connected therewith. Privy Councilor Kuhn entered as inspector in 1814, and died as director in 1870; Councilor Raithel, who entered as bookkeeper in 1851, left as director in 1894. The fact that artists and work people have served for fifty to sixty years causes* no astonishment.

There are employed about 720 persons**, of whom 630 are men and 90 women; among the former being about 480 artists, and the rest being workmen. The establishment until recently maintained at its own expense an art school free to all between fourteen and seventeen years of age, who were taught drawing, modeling and painting by artists employed in the works. A fine library is at the employes' disposal. The rooms are high, well-ventilated the year round, and in winter heated by hot water. To discourage the use of intoxicating liquors a liter (1.06 quarts) of black coffee is sold for 3 pfennigs (3-4 cents), and with milk, for 5 pfennigs.

Beneficial institutions, such as are in force by law all through Germany, have been maintained at the royal manufactory nearly since its inception. There are (besides the usual compulsory institutions for the sick and injured) two prosperous death funds, founded in 1736, and three widows' funds, one of which was established in 1756.

In conclusion it may be added that the institution is an excellent example of the true method of fostering national industry, and that its commercial as well as technical and artistic success should lessen hesitation in America, concerning the establishing of national and state institutions of industrial art.

ROBERT GRIMSHAW.

Dresden, Germany.

*An uninterrupted service of twenty-five to forty years is quite common; and a few years ago there were six veterans at work, whose united period of service was 335 years.

**In 1763 to 1774 (the best period) there were 731 employes.

PUBLICITY AND HAPPINESS.

—A Brickmaker's Happy Venture.—

The surprising experience of Mr. C. Smith Lee, of Fishkill Landing, proves that publicity is not only the best remedy for public wrongs but the surest road to private happiness. He was a widower with six children. He worked in a brickyard all the week and had no time left for personal search for a wife. Having heard what publicity had done for the Ice Trust he decided to try it. So about five weeks ago he advertised in The World for a wife. And now he is a married man, having selected a suitable helpmeet from among the 1,000 women who answered his public appeal.

The fact that 1,000 marriageable women responded to this one advertisement may be variously interpreted. At first sight it seems to support those sociologists who maintain that the housekeeping habit is so firmly established in the feminine mind that, no matter how many other occupations are opened to her, marriage will always be her favorite employment. It may be, however, that Mr. Lee's thousand correspondents included a large number of insincere and ineligible

candidates, who simply answered his "ad." for the fun there was in it.

But why seek to analyze happiness or coldly philosophize about an intrinsically joyous event? Mr. Lee has found a wife who is certainly "one in a thousand," and declares himself "the happiest man in the state." Sufficient to the tale is the moral on the surface thereof. Publicity is not only a great moral and political force but a wonder-working messenger to all creation on all sorts of errands.

WRITTEN FOR THE CLAY-WORKER.

BRICK YARD ECONOMY.

By L. C. Moore.

SHORT TIME SINCE, we shut down for a few repairs on our engine, and concluded to make a special tour of investigation and see if some other portions of our plant had suffered from neglect during the three months of spring rush. When we got through with our critical examination we felt rather guilty as we made a note of the various departments that needed overhauling. The engineer reported that the winding drum was hardly equal to the demands upon its strength. We found the track which leads from the mill to the clay bank in such a rickety state that the wonder was that the engine too was not overloaded, while the full car of clay bumped its way up that track. The cable also showed signs of severe strain from the extra work put upon it.

Our burner reported that one of our down-draft kilns would not draw well, especially when the top got almost to a finishing heat. Upon examination, the tunnels beneath the floor were found to be more than half full of dirt, sand and ashes.

Only two wheelbarrows out of the ten were in good repair, and our trucks were in almost as bad condition. The roof over one of the dry sheds had become quite leaky and considerable bricks had been damaged during the late heavy rains.

The worst of all, "Old Baldy," the pet of the yard, had gone lame and had to be turned upon pasture to recuperate from the effects of overexertion. And when we started to set matters right, every saw had to be filed, and every edged tool ground before any progress could be made.

Now, this picture is not overdrawn in any particular, but is a bit of private history, not only of our own plant, but of nine-tenths of the brick plants one could see during a month's travel.

We spent four days in a general overhauling. The track was straightened, strengthened, and put upon a grade that greatly lessened the draft upon the hoisting drum and cable. Every pulley and belt was put in correct allignment, and new parts added wherever needed. Barrows and trucks, kilns and sheds came in for their share of attention. At last everything was completed, and again the wheels were started to rolling. How lightly and smoothly everything ran and how little attention it all required. It just ran itself. And thus it happened that we could find time to sit down a few minutes and philosophise over the economy of putting machinery in ship shape and by constant attention keeping it that way, and also to devise a system for this purpose that has worked so smoothly for us that we recommend it to others. These periods of closing for repairs are very expensive affairs, as every item goes upon the wrong side of the ledger.

But costly as may seem such work, it is not nearly so expensive as the weeks of labor under unfavorable circumstances. We can get nothing without paying for it. Every unit of labor costs so many units of capital, and there is no way to evade this unalterable law of compensation. It costs more to run a loaded barrow up hill than to run it down hill.

The man may wheel just as many brick per load, and just as many loads per day for a time, and the proprietor may fancy he is getting just as much done, but a man, on an average, will accomplish only about so many units of labor, annually, and, in the end, the proprietor will pay for every extra strain which his negligence or mismanagement may impose upon his employes.

These ideas of the economy of forces will hold good in every department from the wheelbarrow to the boiler, and the money lost in this waste of energy often exceeds the amount on interest on the capital necessary to run the business. It is very necessary that a stitch should be taken in time.

There is an old adage that if you want a piece of work well done, do it yourself. But there must be a great deviation from this rule in a factory of any great proportions. The superintendent cannot attend to all the details of repair and rearrangements that are necessary to be done. He should separate his work into departments, and have a head man over each department. Hold him responsible for all such work over which he is the overseer, and see that he does it well, or get a better man in his place.

The superintendent who imagines that he is the only man on the works who knows how to lace a belt, babbitt a box or allign a shaft and pulleys will have his hands too full of this kind of labor to be a good superintendent. If he has no men who are capable of taking most of this work off his hands, he should get some new and better materials, or else set to work at once to train some of the old. The superintendent should know how to do all this—in fact, he should be a good engineer, machinist, and brick setter and burner, and then he will be capable of knowing at a glance when any work is well done, and thus see that all departments are kept in good repairs. The engineer should be required to see that the boiler and engine are in good shape to start before seven o'clock each morning, and so with the heads of each department. They should have everything in readiness, so that when the whistle blows in the morning, every crew of laborers should be able to do his quota of work and no delay caused by having to patch up some piece of machinery that has been neglected. The men of whom this extra work is required should be well paid for it, and then they will prove watchful and willingly put in extra time that they may accomplish what is required of them. Don't be niggardly in taking account and paying for this extra work. The best of superintendents will let some of the wear and tear of a week's work escape his notice, and only the man at work in his department will be able to see all the repairs that are needed.

He should report the superintendent what he thinks is necessary to be done. The superintendent can review the proposed repairs and give his orders as he thinks best for the good of the works. The next morning, a glance over the work laid out will show whether all is in good order, and generally the machinery will run without a skip or break during the entire day.

This system will keep all wide awake, prevent those vexatious delays during the day, and only few and far between will be those notices "closed for repairs."

ALWAYS BETTER TO CONDENSE.

It has always been my opinion that things in this world are too "long drawn out." Everything except life itself, perhaps, and that's too short. At the best life amounts to only a few days—a few days of joy and a few days of sorrow—and then it is gone. That, I suppose, suggested the thought that what goes to make up that life should be concentrated. Whether it be a measley little three-inch ad. or a proposition to organize a trust, condense it—boil it down. We haven't any time to waste, and all we want is the statement of fact.

Gail Hamilton was asked if a pound of feathers would fall to the ground as quickly as a pound of lead. "Yes," said she, "if the feathers were rolled as tightly as the lead."

Arguments should be rolled tightly that they may not lose their force. They should be condensed, concentrated.—Exchange.

WRITTEN FOR THE CLAY-WORKER.

BRICK PAVEMENTS OF NEWARK, N. J.

Excellent Examples of the Durable Quality of Well Laid Pavements.

—By George W. Tillson.—

JUST ACROSS the marshes back of Jersey City and about twelve miles from New York, is the prosperous manufacturing city of Newark. Her officials have lately taken up very carefully the matter of improved pavements. The engineer of the street and sewer department is Mr. Ernest Adam, than whom no more hardworking nor conscientious engineer can be found in the East. Although his time is divided between two departments he has given the pavement question much attention and is a firm believer in brick as a paving material.

On January 1, 1900, the pavement mileage of Newark was:

Asphalt	29.17 miles.
Brick	3.76 miles.
Granite	33.84 miles.
Trap	12.29 miles.
Telford	11.28 miles.
Cobble	13.56 miles.
Total	103.90 miles.

It will be noticed that, as in nearly all the large cities in the East, brick makes the poorest showing, simply as has been said before, because stone is the most available material, and the taxpayers are not alive to the merits of brick.

They have a good opportunity, however, to get an object lesson in Newark for, taken all in all, the brick pavements there are the best that the writer has seen in the East.

In the late fall and early winter of 1895 the first brick

Congress Street. Paved with Canton Repressed Shale Brick in 1895.

pavements were laid in Newark, Congress street, shown in the cut, being one of the first. The material used was the Canton repressed shale brick, laid on 6 inches of concrete with a 2-inch sand cushion and joints filled with Portland cement grout. The pavement is, as shown in the cut, in first-class condition. Considerable rumbling has occurred on this street. The work was completed in December, when the bricks were fully contracted.

—That Rumbling Sound, Its Cause and Cure.—

There has probably been more discussion and less agreement upon this one point of rumbling, what causes it and how to prevent it, than any other one thing connected with brick pavements. The reason for the rumbling is on account of air spaces between the brick and the concrete base. Why these spaces occur is a mooted question. Some people argue that the brick are laid before the concrete sets and, as it continues to dry and harden, it shrinks and settles away from the brick. That the remedy is to allow the base to thoroughly harden and then lay the brick, when no trouble will issue. Others contend that the cavities are caused by the expansion of the roadway, the pavement forming an arch held by the curbs as abutments, and being lifted from the

Rowland Street. Paved with Catskill Shale Brick in 1897.

base. Their remedy is to leave a space of perhaps an inch in width between the brick and curb and fill it with a bituminous substance which will take up the expansion.

The writer does not believe that either of these methods will always be satisfactory. It must be remembered that this peculiar rumbling only occurs with a Portland cement joint. By using some other less rigid filler the trouble is obviated, but at the same time the efficiency of the pavement is reduced. Some may not agree with this statement, but there is little question. By this is meant a first-class joint. And that brings up again the question of round versus square edges for bricks. If a Portland cement filler is to be used the edge should be square; with other fillers it is not so important; and, perhaps, the round edges would be positively better, but it is almost impossible to maintain a full cement joint with round edges. Coming back to the question of rumbling, there can be no question that a considerable expansion takes place under certain conditions on one street when the brick pavement butts up against one of asphalt. There the pavement has expanded so much that it has not only raised itself up from the base, but also the header separating it from the asphalt, and also the asphalt itself.

The writer believes that a brick pavement can be laid with a cement joint without any trouble arising from rumbling or expansion if the proper precautions are used. When the joints are thoroughly made the pavement becomes practically a brick plank, four inches thick, laid upon the concrete base. If this does not have a firm bearing upon the entire base rumbling must occur and no expansion joints along the curb or across the street will prevent it.

In the fall of 1895 McDonough street, in Brooklyn, as referred to in a former article of this series, was paved with Mack block on a concrete base, with Portland cement joints. No pains were spared by either the engineers or the con-

tractor to get a first-class job. After the brick had been laid, however, and before they had been rolled the weather turned cold and work was stopped. When it grew milder an attempt was made to roll the brick and many broke under the roller and it was found that the sand cushion was frozen. An attempt was made to thaw it out with hot water but it was probably not thoroughly done when the rolling and grouting was completed. In the spring much complaint was made about the rumbling, and it was bad. In order to remedy it a space two inches wide was cut in the brick next the curb to allow the pavement to expand, but it did not reduce the rumbling. A 15-ton macadam roller was run over the block for one entire day in the hope that the brick might be crushed down into the sand cushion, but without avail. The rumbling could not be stopped. The theory of the authorities at the time was that portions of the sand cushion were not thawed out when the grouting was done and these, thawing afterwards, contracted and left the air spaces. The rumbling was not continuous, but occurred in spots, and the above theory was probably correct. So much trouble was caused by this that when the specifications for Washington avenue were prepared the giving up of the cement joint was talked of. Its utility was so recognized that it was determined to give it another trial. The result was a continuous brick pavement something over half a mile long, which has given no cause for complaint on account of rumbling or expansion. This street, however, was paved in the summer time, in quite hot weather, the bricks were thoroughly rolled with a steam roller and well bedded in the sand. The bricks were probably warmer when laid than they have ever been since, but no contraction cracks have appeared. The writer believes that if a brick pavement be laid in the summer time and pains taken to roll the brick sufficiently to force the sand up into the joints no trouble need be expected from expansion. If, however, the street must be paved during cold weather the pitch joint will probably give the most satisfactory results.

—A Shale Brick Pavement that Does Not Rumble.—

Rowland street, as shown in the cut, was paved with Catskill brick on a concrete base, with Portland cement joints. This street had the expansion joint next the curb and every fifty feet four joints were poured across the street with bituminious paving cement. By looking carefully at the picture one of these joints can be seen in the faint, narrow band, running across the street. This shows because the pitch joints remained full, while the cement picked out, so where the pitch was used the pavement is smoother. This street has no rumbling. Mr. Adam, however, does not credit this to the expansion joints. He says that it was so cold when the grouting was done that it was not deemed advisable to use the wet grout. The experiment was tried of mixing the sand and cement dry, sweeping it into the joints and then applying the water. This was not a success as the joints were not thoroughly filled and afterwards were broken so that a sand joint practically was all that was obtained. The pavement, as the cut shows, is in first-class condition. It was laid in December, 1897, and cost $2.00 per square yard.

Johnson avenue is another street where expansion has taken place. This pavement consisted of Mack block, with lugs and grooves, laid with Portland cement joint. Complaints were made about rumbling soon after it was laid, but the expansion occurred the next spring. It is thus described by Mr. Adam in a report made in the following September: "Upon May 10, this year, when the temperature was 94 degrees in the shade, the pavement was heaved at a point where the avenue forms a summit; it is said that a loud noise accompanied the rupture. The break formed an arch, with a 9-foot span and an 8-inch rise, and extended from curb to curb, 4 feet. The lateral expansion could be traced along the curb line for a distance of 120 feet in one direction to a street intersection, and for 200 feet in the opposite one; the cement grout was loosened from the curb. The pressure was so great that a number of bricks were broken which had been forced out of place and many showed a horizontal rupture. The difference in the measurement over the top of the arch and its span was .07 of a foot."

When this pavement was examined last week another rup-

Johnson Ave. Paved with Mack Fire Clay Pavers which Expand and Rumble.

ture was discovered in the same place as that just described. By looking carefully at the right of the picture it will be noticed that the pavement has been raised to within two inches of the top of the curb. The width of the rise is about 15 feet. After the first rupture the pavement was taken up and relaid and no further trouble experienced until now. Just

Roseville Ave. Paved with Mack Grooved Block, Cement Filler and Expansion Joints.

when this last break took place is not known, but probably during last summer. There is little travel on the avenue and so the break was not reported.

The original pavement was laid in December, 1895, and in the light of this testimony it seems positvely necessary to

provide some means of taking up expansion if a brick pavement is laid in the winter with rigid joints. But, as has been said before, it does not follow that there will be rumbling. The expansion joint will not prevent small local cavities. The Johnson avenue pavement cost $2.22 per square yard, and it is good for many years more. South Tenth street was also

Kearney Street. Paved with Catskill Shale Brick in 1897. "A Perfect Pavement."

paved with brick in 1895, the work being completed in December. The material used was the Canton shale brick, with square edges. Mr. Adam says there has been considerable complaints about rumbling, but a drive over it at the present time does not develop very much. The surface is very smooth and even. The joints were filled with cement grout, and the

Webster Street. A Sand Filled Brick Pavement.

work was certainly well done, as it has worn well, and, as a rule, has remained full in the joints, making a much smoother and consequently a much more durable pavement than those shown in the views of shale bricks. The showing of this street is certainly a strong argument in favor of square-edged brick if a cement filler is to be used. Its cost was $2.12 per square yard.

Roseville avenue is another thoroughfare paved with Mack grooved block for a distance of about three-fourths of a mile. The joints were filled with Portland cement. After three blocks had been laid arrangements were made to provide for expansion on account of the rumbling on the other streets.

—Expansion Joints Prevent Rumbling.—

An inch board was laid against the curb and the brick paved against it. After the rolling had been done the board was taken out and the space filled with paving pitch. At each end and at the center of the blocks a strip fifteen feet wide, extending from curb to curb, was also poured with the pitch instead of the cement. The result was that while some rumbling was observed on the first three blocks laid, there was none at all on the portions treated as above. As this work was begun in May and completed in August, the temperature of the bricks when laid may have had as much to do with this result as the method of laying. It is a well recognized fact, however, that the rumbling does not occur on pavements laid with pitch joints. The blocks on this avenue were about 800 feet long. The pavement cost, complete with a six-inch concrete base, $2.15 per square yard.

Kearney street, as shown in the cut, was paved in 1897 with Catskill brick, with the cement filler and six-inch concrete base. The street where shown has a grade of from three to four per cent., increasing to seven at the upper end. It is a beautiful pavement, and will last a long time, although, as can be seen in the picture, the cement has not held in the joints. It has held its shape perfectly, however, and makes a perfect pavement for the locality.

Webster street, also shown in the cuts, is paved with Mack brick, laid with sand joints on the usual six-inch concrete base. This is one of only two streets in Newark which have a filler of sand. It is not as clean as the others on account of being comparatively flat, but is in good condition, as can be seen. Its cost was $2.13 per yard, which is from 12 to 15 cents less than similar work with cement joints.

—Brick the Best Paving Between Street Car Tracks.—

Newark has adopted a plan which has proved so satisfactory in many other places of paving between the rails and tracks on street car street with brick when the remainder of the street is paved with asphalt. This makes the entire roadway smooth for travel, and makes it less expensive to the street car company when repairs are made to their tracks. On one street to be paved in this manner it is proposed to use the pyro-granite bricks, spoken of in the first article of this series as being now on Ninth avenue, New York city. The old company has been resuscitated, and if they make as good bricks as those used on Ninth avenue they will produce a good paving material.

The brick pavements of Newark, as a whole, are the best the writer has seen in this vicinity and judging from their present condition will render good service for many years to come. It was remarked to Mr. Adam when driving over one of the Mack block streets, that the pavement was smoother than when first laid. He laughed, but it is a fact, as the cement has remained in the joints and the traffic has served to wear off the slight roughness always observable in a new pavement. As a rule the fire clay pavements are smoother than those of shale, but this is because the cement joint has held better in the former.

The Newark pavements have been gradually becoming cheaper, those of 1895 costing 2.27 per yard while those of 1897 were laid for 2.00 and 2.05 and those of 1898 for 1.75 per square yard. These last were all of Catskill brick, which accounts mainly for the material drop in prices for 1898. Since that date no brick have been laid on the entire roadway, though from the success of those already down should make them very popular.

Written for THE CLAY-WORKER.

CHANGES IN BUILDING MATERIAL.

MUD, WOOD, STONE, was about the order in which man began to build his houses. Mud, because it was handiest and could be easiest worked or manipulated with the hands. How many ages mud shelters were the only habitations for man it is impossible to say. Structures of such a character would be swept away by the elements, leaving no trace behind. Here and there some sudden disaster overwhelmed a portion of the world, and in the ruins have come down to us more or less well-preserved specimens of mud huts, unquestionably the original shelter for human beings.

Next man made some progress. He developed some aptitude for toolmaking, and it became possible to cut down trees and fashion them into some sort of rude lumber, from which more substantial huts were built. The mud hut was liable to dissolve under prolonged precipitation. The wood hut was in danger from exactly the opposite cause. Its greatest enemy was fire. But while some were probably thus destroyed, a larger proportion were saved from any possible destruction and remained indefinitely the homes of the more or less civilized inhabitants.

But man was progressing and the desire for permanency increased. Not alone did he want habitations which should be as permanent as the hills themselves, but he wanted to build monuments which should perpetuate his memory long after his perishable body had been dissolved into the original elements. He had also progressed in toolmaking, and was capable of fashioning tools which would work stone, though just what they were and how it was done is practically unknown, notwithstanding the innumerable learned essays which have been written upon the subject. All that is really certain is that man was able to work stone and hoist it to great heights, as instanced in the Pyramids of Egypt, built almost before the dawn of history.

For thousands of years wood and stone constituted the bulk of all the buildings erected and all the monuments ever put up. The larger and more elaborate structures were of marble, granite or sandstone, while the lesser and comparatively unimportant structures were of wood. Permanency was sought for in the stone, convenience and low cost in the wood. There appeared to be no method of united convenience of handling or structural manipulation, which would permit a reduction of cost while retaining the same characteristics. Stone, to lend itself to the best effects, had to be in large blocks, and that increased cost, because the expense of moving from the original bed and all subsequent handling was made much larger by the great weight. Decoration was an expensive operation because stone is necessarily hard. It must be hard to be permanent. Otherwise it would crumble away under the effects of the atmosphere.

These structural problems became more serious as civilization progressed, and it became more and more essential that permanency and cheapness must go together. While no historical account of the search for a satisfactory substitute for stone and wood, which should combine the main characteristics of each, and yet be comparatively cheap, it is probably certain that such a search was continued through long years of unsuccessful experiments with various substances and combinations of substances, otherwise no adequate substitute would ever have been found. Though an idea may burst upon a genius in an instant, and from it may flow results that practically revolutionize the entire daily life of mankind, yet the sudden burst of light is but the culmination of long years of patient work on the part of numerous individuals.

The same thing occurred when some genius invented brick. The problem of the ages was solved in the completion of that idea. The people of the ancient world had the germ of the idea. But their bricks were baked in the sun and lacked the essential feature of permanency, because the continuous rains and the action of the winds wore them away. The Israelites partially overcome this objection by mixing them with straw, but even that did not accomplish what they undertook. It needed the application of fire, the burning process, to make brick absolutely permanent. When that was done the long search had been rewarded. The building material combining mobility with permanency had been completed, and henceforth architects and builders could construct buildings and monuments of whatever character they chose without the great expense of stone and with all the mobility with which wood could be used. Further, the opportunities for decoration were so vastly increased that ornate buildings became common and have continued so to this day.

For combinations of beauty and utility probably American architects now lead the world. They are capable of constructing some buildings that rival anything produced in Europe during the height of artistic glory to which the middle ages contributed so freely. But the great majority of owners and municipalities in this country want low cost to govern the construction of everything. Anent to that must be the time limit, and, overshadowing the other two, perhaps, utility. Stone doesn't meet the requirements wholly, though with modern methods of handling many of the early objections have been partially overcome, and the fragile character of wood still continues. Accordingly, architects have turned to brick to supply the required material combining the qualities needed, and practically every large building now in process of erection has more or less brick in its walls. Some are built entirely of this mobile material. Some are partially built of it. Others are only decorated outside and inside with it. And the practice is increasing. Architects are more and more coming to understand its advantages, and more and more are applying it to the solution of troublesome structural problems which require a maximum of solidity at a minimum of expense.

There never was a time in the history of the city when as much building was in progress as there is in New York to-day. A somewhat careful examination of a large number of new flat houses, hotels and purely business structures shows that a majority of them are built of brick or have it included among the material of which the building is composed. Steel frame and brick walls are the most common combination, and the results are quite as artistic and quite as solid as the heavier and more inconvenient stone, while wood has no basis of comparison. So common has brick become in New York during recent years that it is a common saying that the streets are walled, floored and underlaid with brick. It forms the walls or is included in the walls of all the houses and other buildings, especially those built during the past few years. It is the paving of a large number of streets, and all the conduits and sewers are built of it. In the form of tiles it is taking the place of floors and ceilings, and in various decorative forms it adds to the artistic attractiveness of a large number of the buildings all over the city.

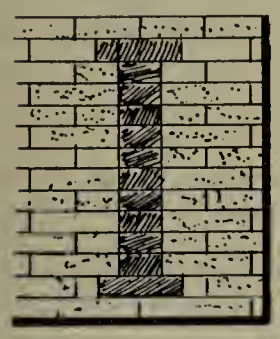
It is more nearly fireproof than any other material used. Marble melts in a fierce fire. Granite gets redhot, and when a stream of cold water strikes it it explodes with as strong force as a blast of powder. Brick alone will stand both the fire and the water and come out of the fire as good as when it went in. In the case of recent destruction of brick buildings by fire it has been nearly always the steel frame which has buckled under the intense heat and the great weight, not the bricks themselves giving way.

In a way, then, man has returned to the methods of building adopted by his primitive ancestors. The modification is that modern man subjects his mud to intense heat to harden it and make it practically independent of the elements, while primitive man merely fashioned the blocks and placed them in his walls, without trying to make them permanent. It is the return to a mobile substance, however, something which allows endless manipulation and which lends itself to the most delicate decorative processes and effects. KNICKERBOCKER.

WRITTEN FOR THE CLAY-WORKER.

THE WEBSTER AND NEPHEW PLANT.

Mr. A. D. Keyser and Our Scribe Talk Over the Merits of the Martin Dryer.



T WAS JUST AFTER the world famous eclipse, a few days back, that I found myself outside this well-known clay-shaping establishment gazing on the cosy office exterior, clad in its new spring robe, a Virginian creeper, something of a novelty in a brickyard, to say the least; cooling to the interior and refreshing to the visitor.

Nearby is the famous pump and its historic ladles, polished with the continued use of one hundred years, and heightened in values because Lord Cornwallis refused to drink from it and Mr. Keyser always does.

But to business. Inquiring for our genial brother, Mr. Keyser, the office lad swung himself clear up to the rafters and the next instant the huge clapper of the loud-toned bell reverberated like the boom of a 12-inch gun, and two minutes later the manly object of my inquiry strode across the threshold and greeted me warmly on behalf of The Clay-Worker.

Together we made our way to the machine shed, and here I found the Martin soft mud machine, which was installed in '93, to be in excellent condition. It has a daily capacity of 32,000, with power furnished by an engine of seventy horse power, and boiler of 100 horse power, of Jacob Naylor's make.

The inspection of the Tunnel dryer proved an interesting feature. This runs in a line continuous and is only separated by the necessary doors from the machine shed.

The length of the dryer is 123 feet and 3 feet 2 inches wide for each section, and four sections in all, with a sufficient space for the setting of 9,500 to each section, or nearly 40,000 for the dryer. Each division being supplied with inch and a quarter pipes, running in longitudinal form, and set six inches from the center to center, with the cross or support tubes set seven inches from center to center, supported by the intersected posts set eight feet from center to center. Outside shutters are supplied with a two-fold object of retaining or driving out the superfluous heat, and some of the intersecting racks are likewise fitted with timber blinds or screens to shield the men from the heat and also to protect the green brick from the climatic influences, so often the cause of cracking.

Mr. Keyser, in speaking of the first experiment, said: "You know we first tried having the Martin dryer 170 feet in length, but this we found to be too great a strain on the boiler, and inadequate to force the steam to the end of the pipes. The pressure on the feeding end being equal to twenty-

Brickyard of Webster and Nephew as Viewed Afar Off.

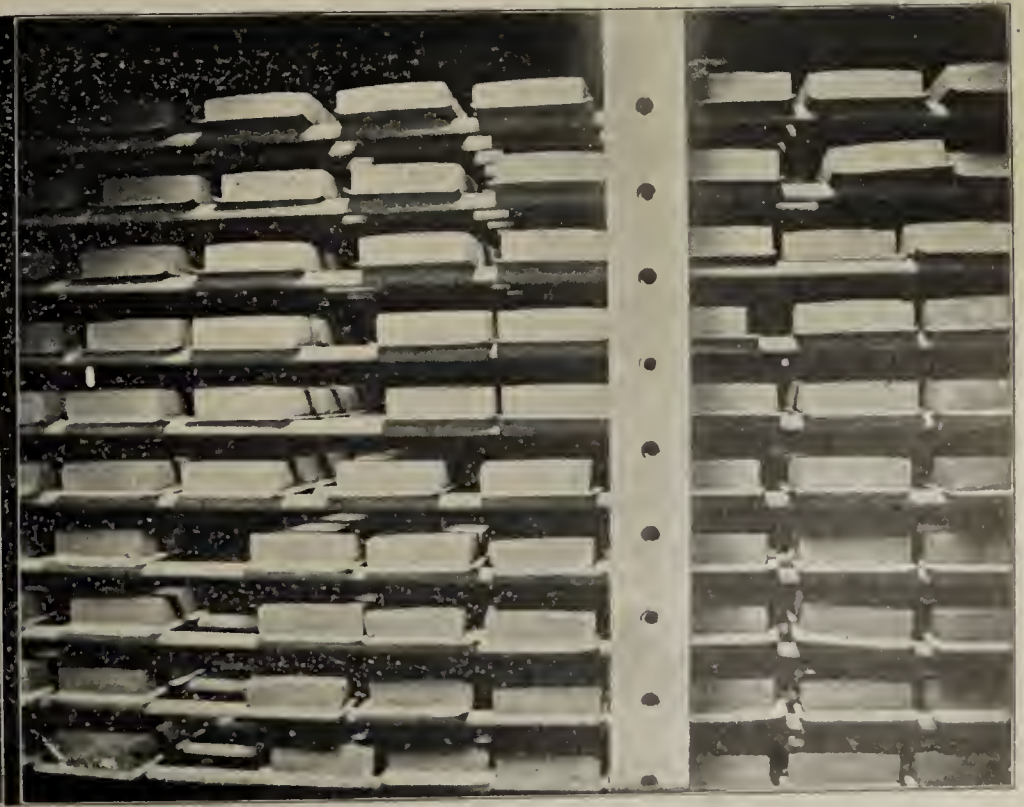
five tons, making the expansion and detraction altogether too great."

Cutting down each section to 123 feet reduced the pressure on the gauges farthest from the boiler. These now indicate from 10 to 15 pounds pressure, sufficient to dry with 50 to 60 pounds on the 100 horse power boiler. Looking to the economic side of the dryer, we find a saving of nearly a carload of coal each week.

Watching the plunger, we found 11 1-2 moulds a minute were turned out, these being transferred to the revolving table, thence to the truck, the average time for the trucker to load being 45 seconds, that is for the twelve moulds and 2¾ minutes from the period of starting to load until his return for another load. This, of course, includes the time of setting, which is done by transferring the iron pallet directly from the truck to the dryer.

The machine men start in the morning at 6 o'clock, and no

The Gauge End of the Dryer.



In the Center of the Dryer.

time is lost, the truckers supplying the setting gang in the order and time mentioned, and all hands are through between 3 and 4 o'clock every afternoon.

The soft mud bricks made at 7 a. m., we found, on inspection, to be already stiff at 10:30.

Mr. Keyser is a firm believer in short seasons, and no winter work, and further, in remembering the Sabbath, to keep it free from brickmaking, if not absolutely holy.

"The trouble is," he says, "that our men will persist in making brick during the winter, consequently the surplus is so great as to depreciate the price, and $6.50 to $7.50 is the best price to be obtained, whereas, if the men would shut down at the end of the season proper, we could get from $9 to $10 per thousand."

In '93, Philadelphia had eighty brickyards, and turned out 450,000,000, while to-day we have only forty yards, turning out 230,000,000.

Of course, with the majority it is rightly claimed that their clay gave out in this particular yard. Such an excuse cannot for some time be made here, since there is sufficient material to turn out five or six hundred million.

One Carnell and three Harris tempering pits and 10—10 arch kilns complete the layout of the yard, which at the present is turning out hard brick as fast as is possible, and Mr. Keyser is applying himself to the supply of the black-headers, now in vogue and demanded by our architects for colonial work. These are always worth from $9 to $10. The season has started in fairly well, with sixty-five men on the pay roll, including the four hand gangs, but later on, when running full, about 100 men make up the total. Signal proof is given of Mr. Keyser's satisfaction in the Martin dryer by the open-handed invitation for "the boys" to come and inspect it any time they please—in season.

And aside—the installation of that dryer in the early period would have saved them $30,000. This is what he says, and he is a pretty good mathematician. If you doubt me, ask him at the next convention to tell you the story of the "boy and the cat." LOCKINGTON.

WRITTEN FOR THE CLAY-WORKER.

EXACT INSTRUMENTS FOR CLAYWORKERS.—No. 3.

—Instruments for the Examination of Kiln Gases.—Continued.—

DIFFERENCE or loss of gas in the examination referred to in the last paper is evidently due to the carbonic acid absorbed, and, since 100 units of volume were taken, the number of cubic centimeters obtained by substracting the second reading from the first will equal the per cent. of carbonic acid. For instance, if the second reading is 86, the per cent. of carbonic acid must be the difference between 100 and 86, or 14 per cent. Similarly, on forcing the rest of the gas into the second bulb containing pyrogallic acid, the difference between the readings before and after absorption will be equal to the per cent. of oxygen. Thus, if before absorption the reading is 86, and 79 after, the amount of oxygen evidently is 7 per cent. The same procedure is true for the third bulb, absorbing the carbon monoxide.

We now have obtained three figures representing the per cent. of carbonic acid, oxygen and carbon monoxide. Assuming that these are the only gases absorbed, which is not exactly true, the gas residue still remaining must be the nitrogen brought in by the air, which is not absorbed. If in the case above mentioned the carbonic acid is 14 per cent. and the oxygen 7 per cent., the monoxide being lacking, since the latter could not well be imagined to exist in the presence of so much oxygen, the nitrogen will be equal to 79 per cent.

But, knowing the composition of the fire gases, how can we calculate the amount of air entering the kiln, whether too much or too little? In considering this point let us agree to call the amount of air necessary for complete combustion, without any excess or deficiency, equal to unity, in for every case. Let us also agree to call the sum of the per cent. of carbonic acid and oxygen "M," the per cent. of nitrogen "N," and the per cent. of oxygen "O." Then the formula given below will result in a number expressing the proportion of air admitted to that required, the latter being always one. Thus, we have:

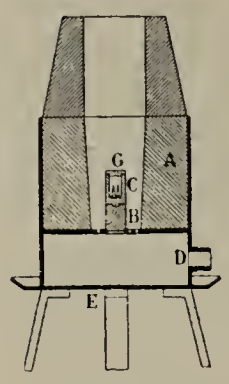


Fig. 12.

$$\text{Air coefficient} = \frac{M}{M - \frac{79 \times O}{N}}.$$

For instance, if an analysis shows 10 per cent. of carbonic acid, 11 per cent. of oxygen and 79 per cent. of nitrogen, the above formula would be carried out as follows:

$$\frac{21}{21 - \frac{79 \times 11}{79}} = \frac{21}{10} = 2.1$$

Or, in other words, the analysis shows that 2.1 times as much air is admitted than is theoretically required. Although, of course, it is difficult to work with only the theoretical amount of air in a kiln, especially since this would lead to injurious reducing conditions, yet there is no occasion for the average clayworker to burn with more than 1.8 times the required amount during the burning stage proper.

Thus, the little apparatus may be made the means of controlling the efficiency of a kiln, both in regard to fuel consumption and oxidizing or reducing conditions, since either of the two conditions is readily detected by means of it.

There are also forms of apparatus which, beside the carbonic acid, oxygen and carbon monoxide, determine also the hydrocarbons and hydrogen. Some of these are the Elliot, the improved large Orsat, the Hempel and other apparatus, of which Elliot's is about the handiest one. None of them can be worked with any degree of satisfaction by persons not acquainted with the chemistry and physics of the gases involved.

These modifications are of special importance for analyzing fuel gases. Many, if not most, failures of the application of fuel gas, artificially produced, can be traced back to lack of knowledge in regard to the composition of the gas. Sometimes the producer may generate more than the allowable amount of carbonic acid, thus lowering the efficiency of the gas and causing the producer to run hot, and again it may burn into too small a percentage, in which case the output of gas is reduced and the generator runs cold. Also, where steam is blown into the producer for the purpose of adding hydrogen to the mixture of other gases and lowering the temperature, a knowledge of the composition will enable the manufacturer to control the character of the gas to a nicety. A discussion of even the most elementary principles underlying the use of fuel gas cannot be attempted in this article, since the subject is much too large.

Where natural gas is used, which, as a rule, is very high in marsh gas, it is often desirable to determine whether or not any hydrocarbons are left in the waste gases of the kiln. If there are any their presence might be very injurious, owing to the fact that they are intensely reducing in character.

—The Deville Furnace.—

The apparatus described under this heading really cannot be called a strictly exact one, but since its use might prove of value to manufacturers of fire clay wares, it will be given a place in this article. The Deville furnace is used to determine the refractory quality of a clay. By comparing small cones of the clay with standard pyrometric cones after being heated to a high temperature in this furnace, the refractory standing of

the clay may be approximately determined. The furnace (Fig. 12) consists of a fire clay cylinder, A, about eight inches high, which is provided with a sheet iron jacket and rests upon a cast iron plate. The latter has at the center an opening 1¼ inches in diameter, into which is fitted the crucible, B C. The plate is also provided with three rows of holes, 3-16 of an inch in diameter, through which air is blown into the furnace space. The iron jacket is extended below the plate about four inches. A pipe is connected with the lower part, through which air is blown from a bellows or a blower. The whole thing is carried by the iron support, E. The furnace space proper is somewhat conical and is lengthened by the addition of another clay cylinder, 7 inches high and 4 1-2 inches wide on the inside. Thus, the entire height of the furnace is about 15 inches.

The crucible, C, has an inside diameter of about 1½ inches, the walls being ¼ to 1 inch thick. For the lining of the furnace, as well as for the crucible, it is best to use magnesite. For testing clays small pyramids are made out of them, with sides of about ⅜-inch, and an inch high. After the cones are dried they are fastened to a small magnesite tile, which fits into the hollow space of the crucible, by means of glue, together with several standard pyrometric cones. The crucible is then covered with the lid, G, and placed into the furnace.

Retort graphite about the size of a hazelnut is used for fuel. With two pounds of retort graphite cone No. 26 can be melted very easily. The tests are continued until the cones made from the clay to be tested show signs of fusion. The cone number corresponding in appearance to that of the trial cone is to be regarded as the melting point of the clay.

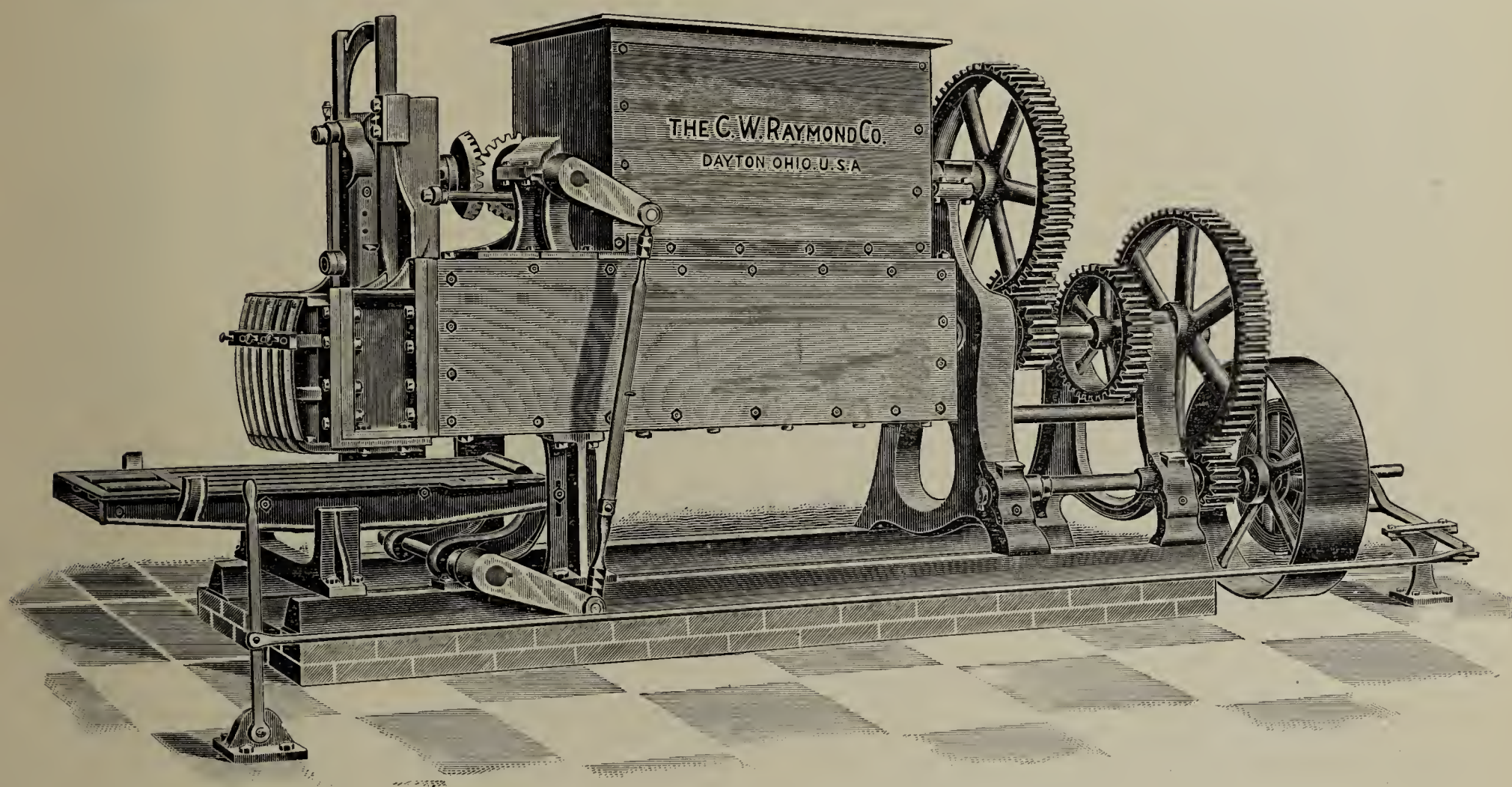
Although these articles have by no means given a complete treatment of the instruments available to the scientific and practical clayworker, it is yet hoped that they may not have been entirely without profit to the readers of The Clay-Worker.

Pine and hemlock stumps and old logs that were supposed to have become worthless years ago are being gathered in Northern Michigan to be manufactured into lath.

THE RAYMOND HORIZONTAL STOCK BRICK MACHINE

WE ILLUSTRATE HEREWITH the Raymond No. 2 Horizontal Stock Brick Machine, manufactured by the C. W. Raymond Co., of Dayton, O., which has just been placed on the market by this enterprising firm. It is made in two sizes—the No. 1 (illustrated in their ad. on page 45, this issue), a very substantial and rigid machine for heavy duty, and the No. 2 intended for use on yards where the requirements are not so rigorous.

We have only room to touch upon a few of its salient features. One of the strongest is the double chamber pug mill. The upper chamber has a shaft passing through it, carrying a number of knives, set closely together and made of spring steel, which chop up or break the clay before entering the lower chamber. The lower chamber contains two pugging shafts, which carry strong pugging knives and pug the clay under the pressure of that above. This device prepares the clay far better than it is possible to do with a single shaft pug mill, which usually carries it forward in one continuous spiral column, and does not give it the necessary thorough mixing. This feature alone is pronounced by all who have seen it, as one of the greatest improvements ever made in a soft mud machine.



The C. W. Raymond Co's New No. 2 Horizontal Stock Brick Machine.

The method of delivering the clay into the press boxes is also deserving of notice. The old style mud wing is done away with and the auger is used in its stead. By using two of these augers side by side on the ends of the pugging shaft the machine, at each operation, delivers a certain specific amount of clay into the press box under all conditions. The two augers fill the press boxes evenly throughout. This is not usually done by a single wiper which exerts greater pressure in the center than at the end. Thus, by delivering a uniform amount of clay throughout the entire length of the press box, every brick gets equal pressure and contains an equal amount of clay, and no poor brick are made at the ends of the mold.

The push bar is operated by a simple rock-shaft movement, which pushes the mold out easily and without jar, and returns in ample time for the insertion of the next mold. It has no

slides, guides, trips, triggers or springs to cause trouble.

The plunger is so constructed that it cannot cramp or bind. In short, this machine has so many features to commend itself that we cannot begin to describe them herein, but would advise all who are interested, or contemplate purchasing to address the C. W. Raymond Co., Dayton, O., and obtain particulars.

"LA BRIQUE."

—Review and Comment by Geo. J. M. Ashby.—

IN THE JUNE issue of The Clay-Worker appeared a short notice of, and welcome to, the new Belgian clay journal, "La Brique," the first number of which was received just as The Clay-Worker was going to press, since then the second, or June number, has been received.

The writer would be glad if he could congratulate the new journal upon the title chosen, "La Brique," "The Brick," but feels very sure that he (the proprietor), and also his advertisers, will very soon find how awkward and incomplete it is and what a long, explanatory, string of sub-titles it needs, to inform the world that not only bricks, but sewer pipes, drain tiles, roofing tiles, terra cotta, pottery, etc., with, perhaps the addition of Portland cement, are under its protecting care. The first paper in the field, naturally, takes the best title. In France the word "ceramique" has been used by more than one clayworker's journal, but there should surely be something better left in the French language than "La Brique."

The introduction to the readers, in the first number, states that the brick industry of Belgium possesses an importance that has been too long ignored, where the annual production exceeds a milliard and a half of bricks.

After explaining the proposed objects and advantages of the new paper the public is informed that in France, in England, in Germany, and in the United States there exist special journals that are devoted to the brickmaking industry, and that some of these journals are very important and of many years' standing. It is gratifying to read that: "It is to their publication that one owes the remarkable progress which has been realized in the brick works of those countries. These journals have provided a technical education for brickmakers in informing them of all the innovations introduced in their craft, in teaching them the results obtained, thus provoking emulation and initiative among all, in order that each might endeavor to surpass his neighbor."

—The Cost of Burning Brick.—

The greater part of the first issue is taken up by an article which is stated to be a treatise upon the whole art of making, drying and burning bricks and other clayware. This is written by the proprietor and editor of "La Brique," Mr. H. De Wit. This treatise does not begin with a dissertation upon the quailties and preparation of the clays, as might be expected, but starts in at once on the question of burning and of kilns. The reason for this is probably found in the fact, as shown in a prominent advertisement, that Mr. De Wit is a brick works engineer and kiln builder, and while this would make his remarks of interest, as he may be presumed to understand his business, yet those same remarks, when criticisms of kilns other than his own, will be open to the suspicion of not being quite impartial.

The author places kilns in four classes: First—Common or field kilns, uncovered; i. e., platted. Second—Covered, intermittent kilns. Third—Semi-continuous kilns. Fourth—Continuous kilns.

By intermittent kilns is meant the ordinary up or downdraft kilns that are set, burned, cooled off and emptied and in which both the goods and the fires are stationary; as distinguished from the continuous kiln, in which the fire, in some part of the kiln, is kept alight from year to year. The title semi-continuous is applied by the author to any multiple of intermittent kilns that are coupled together for the purpose of utilizing the heat from the cooling off bricks, or from their burning; that is, the waste heat from the burning of one kiln is carried into the next kiln before passing to the chimney. He also includes among semi-continuous kilns those in which the tunnel, divided into chambers, does not form a complete circle or oblong, but when the last chamber is burned we have to start afresh in the first and light fires, just as in starting an ordinary kiln.

A comparison, in regard to economy in burning, is made between three types of kilns, and it is stated that the cost of burning one million Belgian bricks, at the present price of fuel (25 francs per ton, delivered at kiln), will be:

In the common field kiln.....	4,500 francs.
In the Hoffman kiln	3,000 francs.
In the continuous recuperative kiln.	2,125 francs.

It may be mentioned here that the continuous recuperative kiln is the one that Mr. De Wit builds.

Under the head of "Utilization of the Heat in a Common Field Kiln," we find that Mr. De Wit bases his conclusions upon the following data:

Weight of 1,000 bricks, burned.....	2,500 kilograms
Temperature of burning.	1,000 degrees C
Heat producing power of fuel.....	7,500 calories
Air used per kilogram of fuel burned.....	12 cubic meters
Specific heat of the clay.....	0.2
Specific heat of the air.....	0.237

A very rigorous calculation would necessitate taking into account the temperature of the surrounding air, but this factor may be neglected as, if we suppose the atmospheric temperature to have a mean of 15 degrees C. it will only influence our figures to the extent of 1½ per cent.

The theoretic weight, in kilograms, of fuel required to burn 2,500 weight of bricks will be equal to the number of calories needed to raise the temperature of this weight of clay to 1,000 degrees C., and also to bring to the same temperature the quantity of air necessary for the weight of combustible.

Each kilogram of fuel, emitting 7,500 calories (heat units), will use 2,844 calories in bringing the 12-cubic meters of air, which the combustion of the fuel demands, up to 1,000 degrees. In consequence of this, only 4,656 calories remain available for burning the clay.

No notice is here taken of the quantities of heat, either absorbed or developed by the chemical transformations of the silicates, or the decomposition of the carbonates and the alumina hydrate; these various reactions about equalize one another.

It follows from this that (theoretically) it takes 129 kilograms of fuel to burn 1,000 brick, it being supposed that all the bricks are properly burned, but in practice we find that in the common kiln 16 per cent. of the bricks are only half burned. In fact, if we take as an example a kiln of 500,000 bricks formed of 62 benches of 8,000 each, we shall get salmon bricks about as follows: Three benches at foot and three at the head—say 48,000, with the outside bricks to the number of about 27,000, making a total of 80,000 bricks, or 16 per cent.

If we agree that these underburned bricks are only subjected to an average temperature of 500 degrees C., there will be a diminution of that equivalent to an eighth part of the total needed for burning the whole contents of the kiln at 1,000 degrees, or 16 kilograms of fuel per 1,000 bricks. By this the theoretical quantity of fuel will be found to be reduced to 113 kilograms.

No account is taken of the underburned bricks in the body of the kiln, because an equivalent quantity of overburned bricks will be found, so that the heat that was wanting in the one would have been received in excess by the other.

It is evident that in using 160 kilograms of fuel we have consumed in pure waste, and without any useful effect upon the burning of the bricks, 47 kilograms of fuel per 1,000, or 41 per cent.

Whence comes this enormous loss? From two causes:

First, the conduction and radiation from the kiln to the earth and the surrounding air; second, the excess of air entering the kiln. As to the first cause, the kiln, without any protection, is placed upon the ground, which carries off enormous quantities of heat by conduction and distributes it by radiation. The walls and surfaces of the kiln are in contact with masses of air that are continually renewed and that are in the most favorable conditions for carrying off a maximum amount of heat. The difference in temperature between the walls of the kiln and the surrounding air is considerable; this difference always remains the same and the outflow of heat never abates, because the surrounding air is continually renewed.

As to the second cause of waste—the excess of air entering the kiln—which takes place in spite of the greatest watchfulness on the part of the most careful burner, it has been shown that the 12 cubic thousands of air needed to complete the combustion of one kilo of coal absorbs more than a third of the calorific power of the coal, one kilo of coal not being able to raise more than 31 cubic thousands of air to a temperature of 1,000 degrees C., which must be maintained in the body of the kiln, it will be easily seen that any excess of air admitted to the kiln must carry off a very considerable number of calories.

The conclusion arrived at by Mr. De Wit is that in the common, up-draft—known in Belgium and Germany as the "field kiln"—there is a pure waste of fuel—consumed without the slightest effect in burning the bricks—of 41½ per cent. of the weight of the coal used, which, in a kiln of 500,000 bricks, amounts to 23,500 kilograms (51,700 pounds) of coal.

Economy of Power.

It is estimated that the cost of steam power, owing to the use of the multiple-cylinder engines, higher steam pressure, steam jacketing, etc., has decreased nearly 40 per cent. since 1870. With a corresponding, or even greater, decrease in the cost of electrical power, the world's work will be done much more cheaply the coming century than it has been accomplished in the present, with results that will effect great social and industrial changes.—Exchange.

Written for The Clay-Worker.

CAPITAL BRICK AND BUILDING NEWS.

JUST NOW the Washington brick market is a little slow, owing to the failure of some expected building enterprises, which will not materialize for a while, and to the great amount of material that has already been furnished. But the output of brick continues, and new demands will come as the season advances, making things, upon the whole, as I have before stated, profitable for the brick manufacturer—as is always the case when selling prices are high and market for product good.

The prosperous times here seem likely to stay with us for no little while. There is more money for investment and other purposes than has been afloat for many months, and the high prices for material does not prevent it from being put into land and buildings.

For a city in which there are no large manufacturing interests, Washington is a phenomenon in the building line, and also in the matter of population, consisting, in the latter particular, of over 200,000 whites and about 80,000 negroes—enough of the latter to populate a fair sized city. Taking statistics for a few years back—from the fiscal year 1896-97 to that ending June, 1899—it is found that the number of buildings—all kinds, except frame structures—put up in Washington was about 2,265. The number of brick dwellings was 1,936, valued at over $6,580,000, and flats and apartment houses 68, valued at more than $1,177,000. The whole valuation for structures for the time mentioned was over $13,656,000.

A Glimpse of the Potomac Terra Cotta Co's Plant near Washington, D. C.

This is not a bad showing for three years' growth of the capital city—and the brickmaker gets no inconsiderable portion of the money thus spent. But he lacks a great deal of getting it all. In this connection let us review, for example, the modus operandi in apportionment for a District of Columbia school building, which is as follows: Appropriation, for everything, $133,000; site, $30,000; contract for building, $84,413; heating and ventilation, $11,993; electric wiring for telephone and clocks, $397; drafting, $1,080; tracing, $15; specifications, $77.83; blue prints, $66.48; skilled labor, $282.50; specifications for heating and ventilation, $13.83; extra work, $1,245.80; deductions for omissions, $1,025.37; forfeitures for overtime, $6.10; superintendence for overtime charged contractor, $232; profit on cement, $435. This makes a total of $129,264.72, and though coming near the amount appropriated, keeps within bounds. Government work does not always, by a great deal, keep within the amount appropriated, and very often Congress must come to the "rescue" before the work is completed.

In the case of the new Bureau of Justice, spoken of in a

Colonial Residence Washington, D. C. Courtesy of Mr. L. Norris, Architect.

previous letter—which is now but a generous hole in the ground where the old building was torn down—the appropriation ($1,000,000) at the start failed to cover—in the "judicial-edificial" opinion of the Attorney General. It is not probable that Congress will give more money for this proposed edifice, and allow the law bureau to be housed in a grand structure not built with a clay product. And so justice will be satisfied. But I still insist that, with one million dollars and a brickyard, a "grand edifiice" can be erected—one that would be a credit to any city or government.

The funds recently granted by Congress for new school buildings will, it is thought, soon be employed in the erection of these much-needed structures, which will call for a large number of brick. There has been a great deal of talk about the manner of conducting the educational system in the District, but one very important feature in this connection is overcrowding in the schools. There is no reason for "herding" children in schoolhouses, and no reason for half-day schools. The building of new edifices for this work should go on until every child old enough for study shall have every just advantage in this interest. And particular attention should be given to hygienic conditions.

It seems to me a strange fact that educational facilities at the national capital do not keep pace with national progress, and that the city which should set an example in this and some other particulars should "loaf along at the end of the procession," content to do only moderately well. Its time to build more schoolhouses in the District of Columbia, and I hope the near future will see this work well under way.

In the above figures concerning statements about buildings in this city it will be seen that the apartment house and flats are coming along in the architectural procession. This year's building season will see some new structures of this kind completed, or nearly so. Among these is one—quite large, four stories high, and located at New York and New Jersey avenues, northwest—which is particularly distinguished from other buildings in its neighborhood by the nature of the brick work. This is of the Flemish bond style, a fashion in brick which is coming into favor here, and which is employed principally in connection with colonial architecture, as it should be. The latter feature is something to be approved, as it is nearly always attractive, and not infrequently charmingly unique.

Another apartment house, the Henrietta, now being erected on N street, northwest, between Ninth and Tenth streets, will also offer its modern conveniences to those who wish to keep house without renting or buying an individual domicile. The building will be five stories high, 49 feet wide and 120 feet deep. Each floor will have four housekeeping suites, each consisting of six rooms and bath, and there will be a large reception room, ample stairways, etc. Electricity is to be employed for lighting and for running the elevator, and a very efficient arrangement of fire escapes is also a valuable part of the tout ensemble. The front of the house will be a double bay window extension at each corner, with center recess, and surmounted by projecting ornamental cornice. Material for the front will be cream brick, limestone and terra cotta.

The Washington apartment house is a popular institution, and a boon to the small family, the family of small means, and especially to young married people starting life on the brain and muscle of the breadwinner. There are more than sixty of these accommodation buildings in this city, and some of them are very large and of fine appearance, inside and outside. In some cases the front is of stone, but brick largely predominates, the colored variety forming quite a frequent and pleasing feature.

The Hydraulic Brick Company here, which makes a large part of the colored brick used in Washington, and which some weeks ago, as mentioned in another letter, had its plant destroyed by fire, is filling contracts, and in about one week will be in full swing.

The Washington Brick Company has crossed the river," but is not "dead;" it has only become a Virginian—one of the brick F. F. V.'s—that work in clay on the west side of the Potomac.

The producers of terra cotta ware are doing good business. I was informed at the office of the Potomac Terra Cotta Company that that company has the larger part of the contracts for furnishing pipe for the District—last year nearly all of this material was supplied by it. This company has practically a monopoly in terra cotta electric conduits used here, where the one, two and four-way conduits meet every requirement. They are all salt glazed, connected by dowels when laid, and are thirty inches in length. This size is the most suitable to insure perfect vitrifaction and glazing when in the kiln, and is easily handled.

The Potomac company has for many years been selling its product here, also shipping it to other places, yet there still is an abundance of clay of fine quality near the plant. Only

recently I was told a new vein, twenty-five feet deep, was found there. The present price of sewer pipe sold here is as follows:

Caliber of Pipe	Main Pipe per foot	Bends or Curves, each	Branches Y or T, each			Traps, each	Weight, per ft
			1 ft long	2 ft long	3 ft long		
In.							
3	$ 0.16	$ 0.50	$ 0.56	$ 0.72		$ 1.50	6
4	0.20	0.65	0.70	0.90		2.00	8
5	0.25	0.85	0.88	1.13		2.50	12
6	0.30	1.10	1.05	1.35		3.50	15
8	0.45	1.80		2.03		5.50	25
10	0.65	2.75		2.93		7.50	32
12	0.85	3.50		3.83	$ 4.68	10.00	45
15	1.25	4.75		5.63	6.88	15.00	60
18	1.70	6.50		7.65	9.35		73
20	2.25	7.50		10.13	12.38		94
21	2 50	8.25		11.25	13.75		100
24	3.25	11.00		14.63	17.88		140
30	5.50						200

NICODEMUS.

WRITTEN FOR THE CLAY-WORKER

THE CHICAGO SITUATION.

The Labor Dispute Still Unsettled—President McKinley Again Figures in the Case.

EVENTS DURING the past month in reference to the building trade have developed a paradoxical condition under which labor will neither give nor receive. A certain few individuals wish to spend money in erecting buildings, and an untold number of artisans and laborers require money to secure the wherewithal to live, but neither party can take advantage of the wishes of the other, for, standing between the two is the demagogue unionist, ably seconded by the boss contractor, each using the argument best fitted to their needs, and neither suggesting a settlement fair to all.

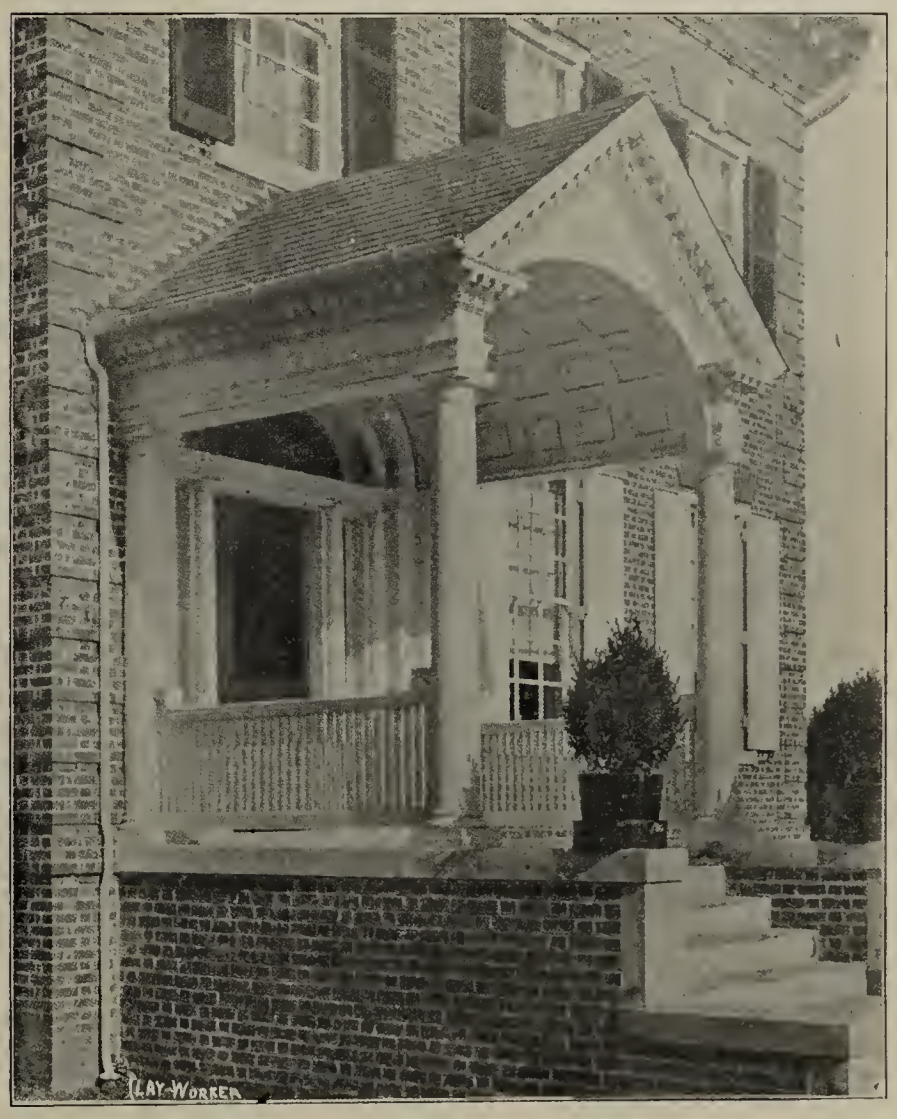
June 27 an agreement was effected between the Masons' association and the Chicago Bricklayers' and Stone Masons' Union whereby all the differences between tne two were amicably adjusted and a three-year agreement signed, adopting working rules which are agreeable to the masons' association and disregarding the former demands of the union while under the sway of the Building Trades Council.

Our Chicago papers slopped over in great shape the next day, June 28, in predicting an immediate revival of the building trade, the disruption of the Building Trades Council and a general rush of the other unions to get into the band wagon as quickly and gracefully as possible. Two weeks have passed and the prophecy of the knowing ones has failed to materialize. Immediately upon the withdrawal of the bricklayers and stonemasons, the Building Trades Council convened and summarily fired the recalcitrants, ignoring their withdrawal notice entirely.

Some of the more conservative members of the council suggested that an exception be made in the case of President McKinley, who is a member of the Chicago union and in good standing to date, but some bright member recalled the fact that Mr. McKinley was "in politics" and, to be consistent, he went with the rest of his union. Secretary Davis, of the council, said that no formal demand would be made upon Mr. McKinley for his card, but that his name would be Dennis if he ever tried to lay any more cornerstones in Chicago.

Sunday, the first instant, a mass convention of delegates from the Chicago unions adopted resolutions, both anarchistic and socialistic, upholding the Building Trades Council and denouncing "bankers, capitalists and a servile press." In the meantime, what are the members of the Chicago Bricklayers and Stonemasons' Union doing since their withdrawal from the central council? They will not work with the members of the "Industrial" union (an independent organization formed since February last and used by the masons' association to date), neither will a member of the thirty-three industrial unions affiliated with the Building Trades Council work with a member of the bricklayers' and stonemasons' union. The natural outcome of this condition is a mushroom growth of contractors and speculative builders, with no financial backing, and between them all, the life of the material man is anything but a picnic, and the showing for 1900 will be a record breaker for Chicago.

Next in size to the bricklayers and stonemasons, is the carpenters' union, still loyal to the central council, but progressing to the extent of electing as their president Mr. Timothy Cruise and retiring their former president, O. E. Woodbury. Mr. Cruise is reputed to be a conservative man and in favor of arbitration or anything else that will allow a man to work. Mr. Woodbury, on the other hand, has distinguished (or extinguish) himself by opposing any and all moves towards a settlement of the present trouble. The executive committee of the American Federation of Labor will consider the Chicago labor troubles the 16th instant and the members



Entrance to Colonial Style Residence, Washington, D. C.

of the Building Trades Council will see that they have enough material to work on, from their point of view, anyway.

Our G. A. R. committee, preparing for the national encampment to be held next month, are having their troubles, due to the fact that the contract for the grand arch has been let to a prominent member of the carpenters' contractors' council, and the unions refuse to march if the arch is built. It is suggested that a six-foot path be left each side the arch, next to the curb, which will allow the marching column to split, and take it "with or without."

Through the intelligent efforts of a Daily News reporter, W. D. O'Brien and W. C. Hoffman, the former president, and the latter a member of the masons' association, were made to play a part in a veritable comedy of errors, which was as enjoyable to their friends as it was annoying to themselves. The item was to the effect that Mr. O'Brien was "butted" into a mortar box by a colored employe, his artillery captured and,

to cap all, both belligerents were reported as conveyed to the police station in a plebian patrol wagon. In fact, it was Mr. Hoffman who had an altercation with an employe, and the circumstance was enlarged upon and run in as a news item with the usual trimmings. While the friends of the two victims enjoyed the cigars, the principals confessed that they were considerably mortar-fied over the undue prominence given them.

To add to the general joy of the masons' association a suit for damages was filed in the Circuit Court the 9th instant, against the association, its officers and members of the material committee, by the Union Pressed Brick Company, for $100,000, alleged to have been caused by certain agreements existing prior to January 1, 1900, between the association and the Bricklayers' and Stonemasons' Union. The outcome of the suit will be watched with considerable interest.

In spite of adverse conditions, some 2,000,000 more common brick were used in the city for the month of June than were used in May, and while no large jobs are in progress, the proportion of small ones in the outlying districts helps swell the average. VERITAS.

Chicago, July 10, 1900.

THE BRICKLAYING MACHINE A MYTH.

THERE HAVE BEEN many stories published of late to the effect that New York was about to be treated to a new invention—a mechanical bricklayer which had been found to be highly successful in England, doing away with the labor of human hands entirely, and making the proverbial horny-handed son of toil who laboriously places the bricks alongside and atop of each other look like unto the proverbial 30 cents, as far as quick and satisfactory work was concerned.

But the bricklayer need not begin to worry yet. A careful canvass among machinery men, builders and the heads of the various bricklayers' unions was unproductive of results as far as actual knowledge of any such machine or its immediate introduction here was concerned. In fact, even the rumor itself could not be run down, and that it is not a factor in the agreement between the Mason Builders' Association and the eight local unions of the Bricklayers' and Masons' International Union, shows that nothing is known of any contemplated scheme to revolutionize the business.

The agreement in question was signed only a day or so ago, and the points taken up refer only to strikes, wages, lines of labor, etc.

In conversation with a representative of The Clay-Worker a leading officer of the bricklayer's union said:

"I have heard nothing of late of any attempt to substitute machinery for human hands in the laying of bricks, so that any story to the effect that we are face to face with that serious problem, and that it has caused us no little apprehension of late, is without truth.

"The facts are that bricklaying machinery, so far as we know, has not yet been perfected. A year or so ago I was told by an Englishman, just over, that while one machine over there has reached a stage where it could lay on straight work, it was absolutely useless when there were angles or anything out of the ordinary to be attended to.

"Of course, in the natural progress of inventive ability, we may have to consider the question of a bricklaying machine. In that event, I presume, we will bow gracefully to the inevitable, and seek some means by which the laborer shall control the work by the machine, instead of the machine and its owner or lessee controlling the man who operates it. The typesetting fraternity, the iron molders and others have all been confronted with this problem of machinery which does away with human labor, and they have always fought to keep the upper hand. I presume when our time comes we, too, shall not give up without a struggle, but, as yet, the matter does not seem imminent." BRIC-A-BRAC.

Written for The Clay-Worker.

BUTTON-HOLE TALKS.

"I WENT TO CHURCH the other day, Gates. What! No, sir. This is no fairy story, but just plain fact. I went sure enough and I go more than you think. I am a pretty good Episcopalian and there are more consistent Episcopalians than you think, too. There is no more consistent common ground of meeting, than that one article of their confessional, where they all join, honestly and fervently, in reciting, 'We have left undone those things we ought to have done and done those things we ought not to have done.' That's one honest statement we can all make to the Lord without dissension or discussion, and if everyone who believes it is an Episcopalian then the church certainly has a large membership.

"I don't mention my going to church last Sunday, though, because the event was at all uncommon, but as leading up to some ideas I got there that I want to tell you about.

"Well, I went, and not only that, I occupied a 'high seat in the synagogue,' for the usher seated me in a front pew. Soon after I was seated the vested choir marched in and my attention was riveted to a very small boy immediately behind the cross. He was a new boy. He needed no sign to tell the story that he was new and not yet acclimated. He knew it himself, and he knew perfectly well that everyone else knew it. He had wandered in, or, possibly, been captured or lassoed and dragged in, or still more probably was the victim of strategy, but he had not yet been polished or tamed. His nose and mouth spoke of other things than singing peans and his hair, rampant and uneven, spoke of the free life of the alley. He knew he was out of place in among the accustomed choir boys, slick, smooth, and confident. Burying his short nose deep down among the mysterious characters on his hymn book, carefully held bottom side up, he radiated, blushed and freckles, as he realized that everyone in the church was looking at him, and that they all knew he didn't know the tune or the song. Everything went round and round to him and he ran into the cross bearer ahead of him and then backed up and stepped on the toe of the good little veteran behind him. By the time he slid into his seat he was mad and indignant that he had been taken advantage of. He knew he was a bad boy in a good place, and he hunched along and told the good little Willie next to him what he would do with him, when he caught him in the alley and had conditions reversed, having a good boy in a bad place. He longed to get back to his own ground. I missed what the preacher said as I looked at this boy and said to myself, would he not feel the same way if he slipped into heaven as he has slipped into this choir. Should he, or his like, slip past St. Peter, would he not feel the same? Would not the feet accustomed to the alley slip on the smooth golden pavement? Would the white robe fit him, or would it just tangle all up and embarrass him? What could he do with a harp, anyhow, and what could a fellow do with wings who had all his troubles with just plain, ordinary hands and feet. As the minister finished his sermon I said to myself I rather think the fellow who lives a good ways away from heaven and thinks he will make a lightning change at the last minute, will have a hard time. He may be like my little friend in the choir.

"It may be done all right, and, in fact, we know the thief on the cross went that way, but I wonder if his feet didn't stumble some and if he didn't feel like this new boy in the choir. I wondered, in fact, if he was not the new boy in that choir." GATES.

In 1899 buildings worth, with the property in them, over $153,000,000 were destroyed by fire in the United States.

WRITTEN FOR THE CLAY-WORKER.

THE CERAMIC ASSOCIATION OF THE OHIO STATE UNIVERSITY.

THE OHIO STATE UNIVERSITY, on the 12th of June, ended a most successful college year. This is true of the entire university and the ceramic department in particular. This department enrolled the largest number of students in its six year's existence and, as a consequence, its adjunct, the Ceramic Association, was also able to show a good membership, although by no means all of the students in clayworking belong to the society. It may be truly said that the organization is the most vigorous technical society at the university. Not only is the membership most faithful in attendance, but the meetings are characterized by a greater degree of originality and liveliness than can be said of similar organizations.

In the beginning of the college year the following officers were elected: W. M. Fickes, president; Walter Hall, vice president; William Cannan, secretary and treasurer.

The successful work of this year is, to a large extent, due to the untiring efforts of the officers and especially of the secretary, a testimony on a small scale to the ability of American citizens of choosing the best men to office whenever the "best" men are available.

In regard to the work of the society the scope may be indicated by the titles of some of the papers: Relation of Tensile Strength of Clays to Plasticity; Some Clayworking Establishments of the Hocking Valley; Why I Entered the Ceramic Department, The Manufacturer of Terra Cotta, The Manufacture of White Ware, Making Pressed Brick in Oregon, Description of Brick Works in Denver, Results of an Investigation of Glazes, The Manufacture of Portland Cement, The Chemical Control of Portland Cement, Critical Discussion of Gas Firing. The Metallurgical and Other Classifications of Glazes. At every meeting three papers are read—one major and two minor—followed by discussions and cross-examination of the members who are on the programme. The number of papers thus read during the year is quite large, the society meeting every two weeks, and the benefits derived are not inconsiderable. Of special interest are the discussions which invariably follow every paper and tend to bring out and clear up the important points.

Keen interest is taken by the society in the convention of the N. B. M. A., and one evening is devoted every year to a report on the convention by one who has attended the same. This year Prof. Orton and Mr. Edwards were asked to give the usual report. Cordial relations are also cultivated with the American Ceramic Society to whose convention Mr. Fickes was appointed delegate.

It is the intention of the association to begin a permanent record of its alumni members, of whom there are now quite a number, in the shape of a neat album containing the pictures and records of the ex-members who left in good standing. The society can point with pride to its alumni members, almost all of whom are engaged in practical clayworking, and a goodly number of whom are making their mark, thus demonstrating that a practical technical education is as valuable in the ceramic industry as it is in other industries.

The Class in Ceramics, Ohio State University.

A new phase of ceramic technology, that is, the subject of hydraulic and especially Portland cement, is making itself felt quite strongly in the department and, therefore, in the Ceramic Association. The society has the pleasure of seeing one of its members taking a prominent position in a large Michigan cement works. It is a most gratifying task to state that the clay and allied industries are realizing the need of specially trained young men and want them in their factories. At present writing the demand is greater than the supply and today all of the ex-members are provided with positions. The president of the association, Mr. W. M. Fickes, has left the university this year, graduating in the four years' course. He finished his college work with an extensive thesis involving a good deal of labor: "The Permissible Variation of Silica and Alumina in Raw Lead Glazes," which certainly is one of the best pieces of work done along this line in the United States. Mr. Fickes will be missed by his associates in the ceramic department, as well as by the students of the university at large, but his college training is finished and the practical application of his knowledge must now begin.

BRICKMAKING IN MISSISSIPPI.

SO FAR THIS HAS been a very unfavorable season for brickmaking in Mississippi, the most unfavorable that has been experienced here in ten years. It rained almost every day from May 25 until about July 3. As a result building has been very slow. There is every prospect of a good season if weather conditions will permit.

Here at Clarksdale, where the extensive brick plant of Clark & Alston is located, work will be pushed energetically as soon as the dry season sets in. So far this season they have only made about 1,000,000 brick, and some 50,000 feet of drain tile of all sizes, from four to twelve inches. Continuous wet weather compelled the plant to absolutely shut down for a stretch of six weeks. They are now running again, and expect to continue right along the rest of the season. There is a good demand for brick, and a moderate demand for tile.

As the accompanying photographs indicate, the plant is modern and substantial. They have recently built a Swift up-draft kiln of 250,000 capacity, and are now making their first burn, and anticipate excellent results. For machinery, the plant is equipped with an eight-mold Brewer brick machine and a No. 1 Freese brick and tile machine, with automatic cutting table, giving them a total daily capacity of 80,000 brick. The machinery is driven by a Frost automatic engine, from the factory of the Frost Engine Co., at Galesburg, Ill. At present the clay is dug by hand and hauled to the mill in carts, but Mr. Clark, who is a very enterprising clayworker, is investigating steam shovels, with a view of using one in the clay bank. They also contemplate the addition of an artificial dryer to their plant in the near future.

Clark & Alston are pioneers in the tile business in Mississippi. They think this branch of the business will ultimately assume large proportions, as there is a great deal of land needing drainage in that section. Mr. Clark is an enthusiastic clayworker and a member of the N. B. M. A., and expects to continue in the business until Mr. John Alston Clark is able to relieve him from active duty. Mr. Clark, Jr., as will be seen by the accompanying photo, is young in the business, but already takes a very active interest in everything that goes on about the plant, and lends a helping hand whenever permitted to do so.

Visiting clayworkers are always welcomed cordially, and those who can will do well to spend a day in Clarksdale.

Clark & Alston's Brick and Tile Works, Clarksdale, Miss.

NOTES FROM DETROIT.

A SAFE ESTIMATE places the stock of brick on hand by Detroit manufacturers at the close of the season at 50,000,000.

It is rumored that A. H. Schmittdiel, who suffered the loss of his plant by fire, will again resume operations next season.

A great and increasing demand keeps Detroit manufacturers running at full capacity, and if present call continues, their stock on hand when season closes will be limited.

All of the brickmaking plants located in this vicinity, with but one exception, use crude oil for fuel in burning brick; the exception still clings to soft cordwood.

The county building being erected in this city, and which required upwards of 7,000,000 brick, is fast nearing completion. Haggerty Bros., a prosperous young firm of manufacturers, secured the contract and supplied that vast quantity of brick.

Architects report a rush of business. Plans for brick buildings, for both business and manufacturing purposes, are in the lead. They anticipate the demand for brick in the fall will be enormous, notwithstanding the interest in a presidential election.

The F. H. Wolf Brick Co. propose to burn a kiln with gasoline as fuel, and, if the experiment proves as successful as anticipated, will establish a system by which that fuel will bo used entirely.

John Greusel, the veteran Detroit brick manufacturer and senior member of the firm of Greusel Bros., who has completed his term of alderman, is being boomed for the office of register of deeds for Wayne, the county in which he has been so many years a manufacturer. Appearances indicate that he will land the plum.

The Detroit market has experienced an advance in prices. Formerly brick went: Common, $4.50 per 1,00; selected and stock, $5.00 per 1,000. The prices now are as follows: Common, $5.00 per 1,000; sewer, $6.00 per 1,000; selected and stock, $7.00 per 1,000. Judging from the present outlook the prices will so remain for some time to come.

Frederick Deage and Henry Ceasse, both Detroiters and both past masters in brickmaking, are anxious, it is said, to rent the large plant belonging to Greusel Bros., for next season. An effort was made this season to rent the plant, but somehow the plan fell through.

Mr. Andrew Lonyo is, perhaps, the busiest manufacturer in this vicinity, having four large plants immediately under his supervision, being owner of two, namely, Andrew Lonyo Brick Works, and a large shareholder in the Larkins Brick Co., and Andrew Lonyo & Co. The daily output of these four plants totals 160,000, with facilities to double the amount, if necessary.

Rear View of Clark & Alston's Brick and Tile Factory.

George H. Clippert and Chas. T. Clippert, of G. H. Clippert & Bro., have built a new plant about one-half mile from the site of the old plant, and which they have in operation with gratifying results. The clay is of fine quality and turns out that kind of brick which are rarely bought. Their plant is equipped with all modern improvements, viz., pallet racks, sheds, machines, etc.

James D. Burns, baseball magnate, president Detroit Baseball team, is also an enterprising Detroit brick manufacturer. He has associated with him Mr. O'Shea, a relative, the firm name being Burns & O'Shea. They erected a modest and flourishing plant. Their brick are sound and well made and find a ready market. Rumor has it that they are unable to fill all their orders, so great is the demand upon the firm. Mr. Burns is a son of Peter Burns, one of the pioneer brick manufacturers in this vicinity.

The opening of the season revealed a scarcity of laborers, which, as the season advances, continues the same. With the possible exceptions of G. H. Clippert & Bro., and F. H. Wolf Brick Co. The other manufacturers, it is reported, have experienced some difficulty in obtaining men familiar with the brickyard labor. Why this state of affairs should exist is not determined. Wages have not been reduced by any of the manufacturers, while some instances might be cited where wages have been voluntarily increased, still there is a vacancy in the file of laborers.

Richard H. Hall, of the R. H. Hall Brick Co., who operated the largest brickmaking plant in Wayne county, but which for some time has been idle, has erected a new plant adjoining Burns & O'Shea. Mr. Hall's efforts are being nicely rewarded as his business is in a prosperous condition. Mr. Hall comes from old brickmaking stock. His father was among the first, if not the first, brickmaker to locate in Detroit. Mr. Hall is to be congratulated on his energy and perseverance, and, I am sure, his brother manufacturers wish him their sincere good wishes for a prosperous and merited career in his new home.

F. J. Clippert, son of genial Conrad Clippert, was quietly married, June 27. Mr. Clippert was for several years connected with his father in the manufacture of brick, when the desire to study medicine caused him to sever his connection with his father in brickmaking. After graduating he opened an office almost in the heart of the brickmaking center and succeeded in establishing a wide practice. He has twice been appointed health officer and twice has he been honored by the people of the village, who elected him president of Delray. He holds the honor of being Delray's first president. Dr. Clippert has the hearty wishes of his former brother manufacturers for a long and happy matrimonial career.

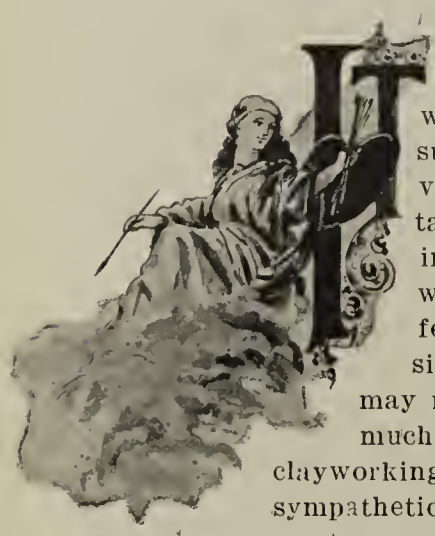
Frederick C. and Frank H. Wolf, sons of F. H. Wolf, of the F. H. Wolf Brick Co., formed a partnership and launched in the brickmaking industry. Their plant is located at Wyandotte, a village twenty-two miles from Detroit. They report a good and steadily increasing demand for their brick. During the spring rains they suffered considerable damage to green brick, but are turning them out at present at a lively rate. The firm are young men, both being still in their twenties, but their experience in brickmaking has been lifelong, and, under so able a tutor as their father, there is no reason why they should not enjoy a long and highly successful business enterprise. They are certainly welcome in the field along with their old competitors in the brick manufacturing fraternity.

Jno. Alston Clark helping in the Shipping Department.

J. G. G.

WRITTEN FOR THE CLAY-WORKER

SCIENCE IN CLAYWORKING.



IT MIGHT ALMOST seem futile to attempt to add further remarks to what has already been said on this subject, but the question is of such vital importance and one which inevitably will continue to exert an increasing effect upon the future of clayworking in the United States that a few additional remarks with an occasional rehearsal of past predictions may not be considered out of place. Too much cannot be said in favor of science in clayworking, nor can clayworkers become too sympathetic in the advancement of this cause, nor too eager to aid in its promotion and to lend the moral and financial support which it merits. Clayworkers generally should stand ready to assist and encourage those who have specialized in this line by affording them opportunities to demonstrate their real worth and prove the value of their technical training. That the intrinsic value of such training at this time is underrated, goes without saying, but the time is rapidly drawing nearer when this condition of affairs will have undergone a material change.

Many a professional man's career, whether we regard the engineer, the lawyer, or who, has been stunted or nipped in the bud simply from lack of opportunity to utilize and put into practice the knowledge for which he long strived. And many men whose names are long since forgotten have passed away without leaving even a trace of their existence through lack of opportunity to utilize their acquired knowledge, yet had the conditions been such as to permit the development of their best qualities, there unquestionably have lived plenty who could have equaled, and perhaps some who could have outclassed as good statesmen and generals as the world has ever known. Had it not been for the war with Spain the battle of Manila would not have occurred, and the success attending the annihilation of the Spanish fleet in Manila bay could not have made it possible for Dewey to be crowned with honors, and named the hero of the battle. This goes down in history as one of the greatest battles ever recorded, and yet had not the opportunity afforded the world would perhaps know no more of him to-day than before the war. It was the opportunity that made it possible for his name to be perpetuated. And no matter how well trained nor what the acquirements are of the young man eager to enter the clay field, if he lacks the opportunity to bring the usefulness of his knowledge into effect it cannot fail to retard certain progress which otherwise would have resulted. Nor is it advisable to place the young graduate in a position of great trust until he has proven that he is worthy and capable to successfully fill such position. Acquiring knowledge is the primary requisite, but the opportunity to apply that knowledge is just as imperative to assure success.

Six years ago the ceramic department at Columbus, Ohio, opened its doors for the first time as the result of the action of the State Legislature in taking the initial step toward the establishment of this much-needed department in its State University. We are just in receipt of a circular from this department setting forth matters relating thereto, and stating that since 1894 some sixty students have studied in this department, and fifteen have carried away certificates who have completed the two-year course. In its broad way of advertising and appealing to the needs of the clayworkers, it alludes to the step just taken by the New York State Legislature in appropriating $20,000 for the equipment of a similar department at Alfred University, Alfred, N. Y. It states also that "Iowa will this year establish a ceramic course in her agricultural college at Ames." It is safe to predict that other States will profit by such action and that in time each State prominent in the producion of ceramic wares can boast of her own ceramic department. Looking backward only a decade we note the wonderful strides in improved machinery; still no one believes that the climax has been reached and the point of absolute perfection attained. The present generation may live on without material improvements along certain lines, but who knows what future generations will evolve? The average clay manufacturer seldom stops to consider that the term "science" has any connection with the improved machinery he is using. He never thinks that it is the mechanical engineer who has been specially trained along these lines that is responsible for many of these improvements. No one to-day would think of engaging in any of the engineering fields with an idea of reaching a place near the top rounds of the profession without obtaining scientific training in that direction. And as time goes on we shall find that the same state of affairs will become more general in the clay industry. See what science has done for the iron and steel industries within a few short years! See what it has done for the glass industry! See what it is doing for the cement industry! It is the special training along these lines that enables men to cope with the various attending problems and to effect an improved condition of affairs. It is to be hoped that in time every clayworking establishment will have one or more specially trained men in its employ and we earnestly look forward to such a time. The thoroughly practical man may cry down theory, but before he is through talking he will signify his regret at not having received more complete educational advantages in his line.

This is indeed an age of specialization. We find the specialist in almost every line. The lawyer, after being admitted to the bar, will specialize and fit himself specially as a criminal lawyer, an irrigation lawyer, a railroad lawyer, and so on. It would be a hard task to enumerate the various medical specialists. Did you ever stop to consider what a broad field the word "ceramic" encompasses? Under "ceramics" comes the glass, cement and clay industries. If the ceramic chemist chooses to follow the clay industry he has to select from a varied list. If he chooses pottery as his field, he must specialize still further for we find many subdivisions here; the yellow ware, white ware, granite, cc., porcelain, etc. He may choose brick, which is also subdivided into many kinds, or he may select tile, sewer pipe, sanitary ware, terra cotta, roofing tile, fire proofing, and the like; and, specialize to the extent he may, he will find that there still remains more room for improvement, and the more skilled he is and the better and more competent his training, the better fitted he will be for the line of work in which he engages. Chemistry and the applied sciences not only render assistance in accomplishing certain possible ends, but they tell us as well things which cannot be done, and a little insight in this direction oftentimes results in a saving of much time and money, as well as expenditure of energy. We can't alter the force of gravity, neither can we alter the fixed laws of nature nor increase or diminish the chemical relation which one element naturally exhibits to another. Many difficulties arise which we attribute to chemical causes, but which, upon investigation, are traced to practical ones. The writer has met with the same proposition on more occasions than one, and, indeed, a problem of this kind resolves itself into a serious factor if one is basing his calculations on the trouble which he is trying to overcome as arising from the use of a wrong mixture chemically, when, indeed, perhaps the mixture was all right and the trouble traceable merely to some fault in the application or to some minor causes. It is here again that the effects of little things assert their importance. If we look after the little things the larger ones will take care of themselves. We are reminded of the old saying that "The pennies make the dollars," and so do the minor things go to make up the larger ones in every day life. Success has often been turned to failure for lack of closer at-

tention to the little things. One thing which should be borne in mind by the manufacturers is in regard to expecting great results too soon, and it is almost absurd in any line of experimenting to limit the cost to such a degree that the work cannot profitably be accomplished. If knowledge along certain lines must be had the experimenter should accomplish this without regard to expense. The question of cost should be an afterthought. Let the feat be accomplished as best it can, and after attaining the desired results it is then time to minimize and reduce the cost of production. One word more in regard to the time limit. This is equally as gross an error as limiting the cost. A classmate of mine, after several satisfactory exchanges of letters with a large clay manufacturing concern, went several hundred miles to fill a position of a technical nature, but upon his arrival the management figured the time required to burn and cool a kiln, and finally arrived at the conclusion that he would give him just eight days to produce a satisfactory line of glazes bearing certain qualifications, which they themselves had not accomplished in more than that many years. See the inconsistency! They were acquainted with the kind of body used, with the kiln conditions, the temperature, etc., and were unable to produce results satisfactory to themselves, yet they expected this young man, because of his training, to work wonders in eight days. It takes time for a man to get his bearing in a place of this kind, just as well as it does a man at sea with only the starry heavens to guide him. It requires time to obtain chemical and rational analyses, which are almost indispensable in some cases to assist in formulating and calculating different series of glazes. It takes time to make these analyses and examinations. If it did not and we could find the analyses of our various materials lying around, it would not be necessary to pay from twenty-five to fifty dollars for each analysis. It is true that that after looking the field over the young man could probably have formulated a few sets of glazes, and possibly hit pretty close to the mark, but when one is placed under such restrictions he never knows when he is safe.

With the change of times and advancement which marks one year after another, the successful brick manufacturer strives to keep his yard as nearly up to date as possible. He attempts to put in the necessary machinery best suited to surrounding conditions. If he contemplates putting up new kilns he seeks to put up the kind best suited to his needs. And so if he is making alterations with his dryer or in the general run of his plant he devises what he considers best under the circumstances, and, indeed, perhaps the best possible, and we have no right to criticise his judgment in the selection of his talent to cope with the varying perplexities which mark every-day life. And it can only be hoped that he'll find it to his advantage and profit to show favor to those who have specially fitted themselves and mastered the theoretical side of the question, and allow an amalgam to form uniting theory and practice, which, if judiciously handled, cannot fail to attain satisfactory results.

E. E. GORTON.

A HOME COMFORT SWING.

THE accompanying illustration shows very correctly the "Home Comfort" lawn, porch and house swing, a new invention which has just been put on the market by M. C. Henley, the well-known manufacturer, of Richmond, Ind.

It will be observed that this is a low down swing, made on an entirely new and practical principle, novel in construction, doing away altogether with the high derrick frame heretofore used for lawn swings.

It is strongly built of best material throughout, compact, durable, attractive and symmetrical in appearance, and ornamental as well as useful and practical. It is so light and easy to handle, and of such convenient and desirable shape that it can be placed anywhere, under shade trees, arbors, or on verandas, or in any room in the house.

It will be seen by the illustration that the sides to which the supports for the swings are attached extend only as high as the level of the seats, thus there is nothing to obstruct the view or produce dizziness. The backs can be instantly adjusted to any desirable angle, and by raising the foot rest, and with the addition of robe and cushions, a most comfortable swinging couch is made.

The Home Comfort Swing.

The swing is also well adapted to children's use, by raising the foot rest to suit. The weight of the swing is supported on iron bearings, and it is so well balanced that even the smallest child can operate it.

It has a swinging motion of 2½ feet. This motion is secured by a light pressure of the foot, which also causes the seats to rock, thus making a desirable combination of rocker and swing.

The foot rest is low down and has little or no lateral motion, so that it is very convenient and easy to step on and off the swing.

Mr. Henley reports that although this article has only just been put on the market, that the favor with which it has been received, and sales already made, indicate that it will prove one of the most popular and rapid selling articles on the market.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

WRITTEN FOR THE CLAY-WORKER.

PHILADELPHIA BRICKLETS.

THE OLD CITY of brotherly love is running quite consistently, keeping up in her building operations and demanding the usual quota of bricks, notwithstanding the presages of the pessimists early in the spring. The general average cost per month for new buildings is about $2,000,000, and during the last month (June) some $2,400,000 was put out. This does not, of course, include the amount spent by "the boys and delegates" hailing from Indianapolis during convention week. To those who were present I leave the recital of the week's experience, to those that were absent I append my sincere regrets.

The huge convention hall, thanks to the masterly aggressiveness of Murrell Dobbins, was completed and furnished in accordance with his promise and contract within the specified price and time, for which he won both the plaudits of his honor, the mayor, and the business men of this city.

Honors never come singly. He was appointed by the mayor member of the executive committee, chairman of the finance committee, and, being born of good Jersey stock, was appointed chairman of the reception committee to receive the New Jersey delegates, an office that he carried out with all the extravagance of high domestic science, a lavish hand, a clear head, and a large heart.

One New Jersey brickmaker told me confidentially: "Shay, shav'nt hash ser mush shoo eat and drinksh since had ther typhoon fever."

One hundred and two drinks and thirteen soft-shelled crabs accounted for his thickness of speech.

What Mr. Dobbins does he does well.

Hearing gold edge reports of the doings in Martha & Early's yard, at Germantown, I made a run out and got substantial confirmation. The location is a good one, characterized for its supply of fine artesian well water and an abundance of good air, dually so recuperative that the men never ask for a vacation.

In the office I was heartily greeted by Charlie H. Melcher, who needs no second introduction to the readers of The Clay-Worker, and Andy Pierce, the genial superintendent, who pointed out with pride that while they turned out last year some 16,000,000 bricks, the output for this year would far eclipse it and would run into 20,000,000.

The two Penfield machines were going strong, turning out their daily average of 40,000 each, and the cars were moving right smart at a minute clip for loading from the machine to the dryer, and the six hand gangs were singing lustily:

Dump the clay, now stan' away,
Another mold there, Charlie;
Dis nigger's worked from half past five
And he's goin' to quit right early.

Two new eleven-arch kilns are being put up by the brickyard graduates, making a total of twelve kilns.

Over in the southwest corner is a well-equipped grinding shed, run by none other than our old friend, Charlie H. Melcher, who, since his retirement from the Peerless Brick Company, has been singing the one grand anthem of labor here and at New York. Taking up the architect's plans, and grinding brick to a nicety of a 128th part of an inch; fitting segmental semi-circular and ellipse moldings, working sometimes day and night, but always ready to meet a friend.

And what a fund of reminiscence—his mind travels in swift unison with his eyes, and in brickyard parlance, he is an adept.

The Peerlees Brick Company is at present showing very little activity, the glory of the past is enveloped in a state of physical inertia.

There remains, however, the 72 acres of good land on the old York road, and the is valued at nearly $500,000, and, as the company was capitalized at $300,000, this alone would prove a good offset.

Rumor has it that Messrs. Murtha & Early came near taking it, and but for the prohibitive clauses in the lease, would have done so.

In relation to the above yard I regret to have to report the sad accident which occurred to Mr. Johnson, the able secretary, about two weeks ago. While superintending the loading of a grinding wheel, he, in the largeness of his heart, gave a helping hand, with the deplorable result that the wheel slipped and broke both of Mr. Johnson's legs.

The report yesterday, July 2, states, however, that he is doing well, and that the legs need not be amuptated.

Frank McAvoy has completed his first shipment of 1,500,000 of his Perkiomen vitrified beauties to Havana, and is getting another pile in readiness for the next call. The output for this season will, they estimate, be close upon 10,000,000, as against 9,000,000 for last year.

Alec McAvoy, at Frankford, is running both machines up to the top notch, reports business as good, calling on him for this year for about 8,000,000.

Thus far the season has proved satisfactory, and complaints are few. LOCKINGTON.

REVERIES OF A SATCHELOR.

"HELLO, OLD MAN! First time I've seen you since Detroit. Say, but wasn't that a great convention? Just keep your finger out of your buttonhole; don't think for a minute that I'm one of those fellows Gates talks so much about. When I can't hold a man long enough to speak my mind without tying him down or backing him into a cal-de-sac, I want to resign. 'Hoarse whispers,' 'nervous glances,' 'bloodshot eyes' or 'resignation to my fate' don't apply to yours truly. When I start, I go through like an eel through a water pipe. There's no turning back with me, so just settle yourself in the easiest chair in this hotel and lets talk.

"You've nothing particular to talk about and put in four days at Detroit! Why, man, the memory of my four days will stay with me forever, and will always be a source from which to derive inspiration, solace after a blue day and then the many involuntary spontaneous laughs of recollection act on my liver like David's music on King Saul. Oh! you do remember that, do you? Well, that certainly is a bright spot and well worth pasting in your memorial scrapbook, and you can jot this down along side of it. True hospitality is never ostentatious, but a simple surrender of one's possessions to another's needs. This was never better illustrated than at Detroit.

"Another thing that strikes home to both of us, we—that is, machine and kiln men—were never better provided for than at Detroit. We seem now to be occupying our proper place. The convention, as a body, is recognizing our value, not only as exhibitors, but as discriminators of knowledge and information, valuable because acquired in actual practice and under varied conditions. Why, man, if we cannot drop onto something new between conventions, with our range of travel and multitude of opportunities, how can these people expect to find it, who never leave Mudville except to go where the executive decides the next convention shall be held? It would cost them hundreds of dollars to go where we, collectively, have been, and see what we have seen, but they get it thrown in with just their convention expenses. Yes! Why shouldn't we be in demand? and, as you say, why shouldn't we be recognized as a very necessary part of the whole?

"Yes; I sometimes do think I would give anything to be able to say, 'I am a charter member of this association,' and then, again, I feel kinder glad I came on just one year too late. Why? Why, man, just look at the temptation I am spared. Did you never notice how this knowledge will persist in obtaining itself, it doesn't matter whether pow-wow banquet or convention speech, it will out. I don't mean to say that a man

ought to feel like apologizing for being a charter member, because it wasn't really his fault; he didn't know what he was doing at the time; he couldn't tell then that the baby born at that time would so quickly develop into so strong and healthy maturity, so I say he wasn't to blame. Somebody had to sign the charter and he happened to be around. I don't blame him either, for being proud of the honor. If I had $50,000 I would not be a socialist, so there you are.

"One thing especially pleased me, and that was the selection of Gates for president, made possible by Detroit's generosity. Never did a selection better please the rank and file than did this one. How old do you think he is? I'll pass my guess, although I have often wondered and sometimes thought it just depended on how you caught him. Sometimes I could swear he wasn't over 30 (that's when he develops his smile). In repose he looks fully 40 (that's when he is contentedly listening to somebody else talking), but when he gets to talking himself I give it up. Remember, this is strictly between you and me.

"Business good this trip? Same here. Let's take something." ONE OF THE ANNEXED.

Written for The Clay-Worker:

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 9.

BY ALFRED CROSSLEY.

—Grinding and Tempering the Clay.—

THE METHODS OF GRINDING and tempering clay for fire brick are somewhat various. In the North of England the usual method is by the "fire brick mill." It is similar to the well-known "chaser" mill, at one time so much used in the sewer pipe works in America, but on a larger scale. It consists of a stationary pan with perforated gratings in the outer ring, in which revolve an enormous pair of crushing rolls or stones, which in their action follow each other round on the inner circle or solid part of the pan. As the clay is crushed and ground it is swept onto the perforated plates, the fine dropping through and the rough being again caught by scrapers and carried back under the rolls again. The ground clay is taken up to the top story of the building by bucket elevators, goes through a revolving screen into a vertical pug mill, where water is added till it is of a proper temper and from thence is distributed to the molders' benches. In America this method is unknown. The methods in use here are the wet pan process, where the grinding and tempering are done together in a solid bottom pan, the dry pan and wet pan combined, and the dry pan and pug mill combined. This latter is practically the same in effect as the method in vogue in England. Other methods of grinding have from time to time been tried, but have failed of adoption to any extent for various reasons.

The wet pan process, I think, is wrong in principle, and for any but non-plastic clays must impair the refractoriness of the brick, as it increases the plasticity of the clay. The clay is dumped into the pan in the rough, water is turned on, and the charging is ground and tempered until the attendant judges it to be fine enough. It is next to impossible to get the clay of a uniform grain, as some of it gets ground too fine, while another portion may be too coarse. Then again, the process is slow, and for extensive works it takes a great many pans to prepare enough clay, the usual quantity for each pan being a molder's day's work of 4,000, plus an allowance for waste.

The proper way to prepare clay is, first, to grind it, and then to temper it. This is the principle adopted in both the other processes named. The dry grinding pan is no doubt known to most of our readers. In this pan only the space covered by the tread of the rollers is solid, outside that it has a perforated bottom through which the clay falls as soon as fine enough, into a solid stationary catch-pan underneath. Scrapers fixed underneath the revolving pan carry the ground clay round to a dump hole, where it falls into the elevator pit. In some of the most recently constructed pans, however, the catch pan is done away with and the clay falls from the pan into a deep pit, the walls of which converge to one point, viz., the elevator boot. It is from thence in either case carried up to an upper story, run through a screen, either stationary or revolving, and is then ready to be tempered. The tailings go back to the pan to be reground. The proper coarseness of grain, of a fairly uniform size, is easily obtained by the screen or sieve referred to, of a suitable mesh. A good dry pan will grind clay for 20,000 fire brick per day, and even as high as 30,000. I have, indeed, seen dry pans that had to be pushed to grind for 10,000, but they were mere toys beside the large, improved pans just referred to. The rims of the rolls and the bottom of the pan, both solid and perforated, should be of very hard, if possible, chilled iron, or better still, of cast steel. I am aware that the latter is much more expensive in first cost, but in the long run is much the cheaper. If made of a soft iron these parts quickly wear, lessening the capacity of the pan, and involving expense in renewals.

In the second process named, the tempering is done in a wet pan. As the clay has already been ground by the dry pan, a comparatively few revolutions of the wet pan are sufficient to mix up the clay with water, and bring it to a proper temper for molding. The clay is usually taken out by hand, either with a loose ordinary spade or shovel (almost dangerous method) or by a lever shovel fixed for the purpose. A special style of pan is, or was, used by the Mount Savage Fire Brick Works. In this pan the rim is fixed to the frame, and does not revolve. In the rim is a gate or door, which opens into the pan. When a charging of clay is put into the pan and is sufficiently tempered, the gate referred to is opened and the clay is automatically discharged. This is an ingenious plan, and would seem to be a great improvement. Up to within a few years ago this pan had been used only in the Mount Savage works, who built it, along with most of the machinery, in their own shops, the first of its kind having been imported from England, but it has since been adopted by other works also.

In the third process the tempering is done in a pug mill. In the case of plastic clays an open mill or mixer may be used, but for non-plastic clays, or where considerable calcine is used, it must be a closed pug mill of good length in order to get the clay tempered sufficiently for molding. This process is somewhat analogous to the English fire brick mill before spoken of. To my mind the principle of this process is the most correct one. The clay not having to run under a heavy squeezing, rubbing pressure, the grain of it is left more unbroken, without its particles being blended into an adhesive, highly plastic mass, and at the same time by having the pug mill of proper length and shape, the necessary temper of the clay can be obtained. It also costs less both to construct and to operate than the wet pan, and can often be so arranged as to dump the clay to supply a number of molders.

The old wet pan process referred to, despite the objections adduced, has, nevertheless, one advantage not possessed by either of the other processes, and that is, that each molder may be working on a different grade of brick, requiring a different mixture of clays, and by having a wet pan to serve each molder several different mixtures can be going on at the same time, whereas in either of the other processes only one kind can be made at once, and, therefore, all the molders must work on the same grade of brick, and I do not as yet know of any plan by which this can be adjusted. This does not have any bearing on many fire-brick works in England, at which is made but one quality of brick the whole time, but there are many works where several distinct grades are regularly made, and in the American fire brick works this is almost universally the rule.

(To Be Continued.)

Written for The Clay-Worker.

A MODERN CLAYWORKING FACTORY.

THOUGHTS EXPRESSED in this article were suggested by the reading of the paper having the same subject, and the discussions upon it, read before the Ohio Brick, Tile and Drainage Association. So varied are the arts in the several branches of clayworking that a factory well adapted to the manufacture of one kind of wares cannot be well adapted to all. The very general method of discussion usually adopted causes great confusion to the beginner. The same error has frequently been committed in discussing the subject of kilns and their several parts. When we are discussing the features of a down-draft kiln or a factory, we should have large working drawings before us. Mr. Wilson has been to considerable labor to illustrate his subject. The paper and drawings presented a definite plan which was deserving of far more consideration than it received. The discussion was diverted by a few questions that have been asked and answered many times in our conventions. Steam pipe under slat floors, using exhaust steam when the engine is running, and live steam when it is at rest, is a method of drying that is too old to be considered novel, and too commonly used to have its utility questioned, and the use of brick floors heated by fires beneath is certainly one of the oldest devices for drying known to the trade. Any person who has attended our conventions, read any work upon the subject of brickmaking, or been a subscriber to any of our trade journals could hardly be ignorant of the general construction and use of these devices. If any one in Ohio wishes to build a factory for clayworking and would like to see the different systems of drying, he can find them all in his own State. Let him go to Toronto and visit the factories on both sides of the Ohio from there to East Liverpool, and he will find slat floors heated by steam in factories from one to four stories high, and hot brick floors heated by coal fires. There are, however, but few of the latter and those in the older factories. You can visit about thirty factories within as many miles. From Toronto to East Liverpool large quantities of fire brick, paving brick and sewer pipe are made and the reputation of East Liverpool potteries "has gone out into all the land." You should visit Canton to see its paving brick factories. The hollow bricks for foundations of frame dwellings came into use in this vicinity, and large quantities are made. You will notice that steam in the greater number of factories is used for drying and that hot brick floors and kilns within the walls of the factory are going out of use and that the tunnel system for drying brick is coming into use. The hot brick floor is not suitable for drying anything but brick. For this purpose it has proved efficient, especially where coal was abundant, but we believe it will soon go out of use.

The practice of locating the kilns in the factory is very old. The Salamander Works, of Woodbridge, N. J., recently burned, said to be the first manufactory for fire brick in the United States, had its kilns within the factory. It is a practice copied from the potters and was probably followed by them in ancient Egypt. The potters are now using steam heated dry rooms and have their kilns outside of the factory. The factories are lighter, more conveniently arranged for work, and much more uniformly comfortable for the workmen than would be posible with the kilns in the work rooms. The placing of the kilns outside of the factory is the more modern practice. The Pioneer Company, of Ottawa, Ill., and the great sewer pipe factories in our Western States have their kilns outside and dry all their pipe by steam heat.

It is fearful extravagance to allow the exhaust steam to escape when it carries with it sufficient heat with the heat from live steam when the engine is not running to dry all the ware made by the engine if the ware is hollow. The saving of the heat from the cooling kilns to dry our ware is not so important as it appears to the novice who is making drain tile and hollow blocks. To one extensively engaged in the manufacture of brick it is an important question, but we are constrained to believe that this will not be done by forcing the heat from the kilns underneath brick floors as suggested by Mr. Eudaly. There is too much labor in the system of drying on hot floors. It is, however, a favorite system of drying soft mud brick.

All will agree with Mr. Wilson that "it is cheaper to build additional floors under one roof than to spread out, with one story on the ground," but the question is not cheapness of construction of factories; it is economy in manufacturing clay wares. If the paper had been read before an Illinois convention objections like the following would have been offered: "Why elevate our wares three or four stories to dry, and lower them, when they can be dried on the ground floor and wheeled directly to the kiln." "Too great risk of fire." "Our low factories, with steam driers, are nearly fire proof." "Our kilns do not endanger the building and machinery." "A fire would mean complete destruction." "How about insurance?" etc.

The paper advises building a stack sufficient for two kilns and a boiler. We have known seven down draft kilns to work successfully with one stack, but we have never known a boiler and a kiln to work well with only one stack. The water smoke seriously affects the draft through the boiler. We would have either a separate stack for the boiler or a separate flue in the stack.

The only novel feature in the plan or that can be called modern, is the system of ventilation. As we understand the description the draft is upward in the kiln room, downward through the drying rooms and upward through the ventilating flues, but how can this be? The air in the wall flues must be colder than in the drying rooms and according to our philosophy it should pour down the wall flues, and, being heated by the coils, would rise and escape through the ventilator in the ridge of the roof.

The paper says it takes 3,500 feet of drying room for a 20-foot kiln. The plans show four floors, 40x100, 16,000 square feet; two floors 35x100, 7,000 square feet—23,000 square feet. There is sufficient drying rooms for six kilns and there are only two. Are the other four kilns to be built out of doors?

TIFFANY.

DON'T WORRY—THINGS WILL GO ON.

There is always the consolation for those familiar with American history, under the apprehension of the nation electing an objectionable President, that such Presidents in the past have not been fatal to the public prosperity, says the editor of the Boston Herald. From this it follows that there is no cause for despair, or, indeed, for any very serious apprehension, if such a President should be chosen in the future. There is always a tendency to exaggerate the danger from this cause. The opposite party to a candidate does this of set purpose. It is part of its political business to represent the nominee against whom it is contending in the darkest colors he can be painted. We obtain from this a lesson that the country is stronger than its President. There is, none the less, the call for care in their selection, and there are clear opportunities for a wise preference in choosing between candidates for the office, but under our form of government the integrity of the nation itself is safe, whoever is chosen.—Exchange.

Quaint Proverbs.

The dullest fellows may learn to be comical for a night or two.

What we place most hopes upon generally proves most fatal.

The fortunate circumstances of our lives are generally found at last to be of our own making. Let us be inflexible and fortune will at last change in our favor.

Mortifications are often more painful than real calamities.—From "The Vicar of Wakefield."

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

A Correction.

EDITOR CLAY-WORKER:

On page 528, of your June number, headed "Brick Pavements in Greater New York," written by G. W. Tillson, in which he states Jerome avenue, looking east from the Harlem river, and at Far Rockaway, looking north from the sea, Central avenue, Long Island Station, South street and the front of the Tack-a-Pan-Sha House is paved with Mack brick. This is an error, our firm having furnished the brick for the above named streets. We furnished the brick to J. C. Rodgers, contractor, New York city, to pave Jerome avenue, and to Edward Roche to pave Far Rockaway. You will please make this correction in justice to us in your next issue, and very much oblige,

JAMES M. PORTER,
Superintendent McMahan, Porter & Co.

New Cumberland, W. Va., June 23, 1900.

Cincinnati Brick News.

EDITOR CLAY-WORKER:

The brick manufacturers of Cincinnati have all been quite busy so far this season. Good prices have prevailed up to this time. Just now there is a little lull, as is usual in midsummer. Indications are that there will be a great deal of building in Cincinnati this fall. Many large office and factory buildings are projected. These, with the multitude of small jobs, will take about all the brick that the local manufacturers can turn out.

The Bruns Brick Co., whose plant is located at Brecon, a suburb of Cincinnati, have been running right along. Mr. Bruns is a good brickmaker, a clever gentleman and a hustler, and always gets his full share of orders.

The Cincinnati Brick Co. report that they have all they can do. Besides their usual local trade, they are furnishing brick for a large tuunel of the Baltimore & Ohio Railroad.

The Blair Brick Co. is still being operated by M. J. Blair, as assignee. They recently secured a contract for 4,000,000 hard brick for a tunnel on the Southern Railroad.

Mitchell Bros. report that they have all the orders they can take care of. There is a great deal of building in the suburbs. In short, the building situation here is quite satisfactory.

BUCKEYE.

The Brick Interests of Western New York.

EDITOR CLAY-WORKER:

The brick manufacturers in Buffalo and vicinity are fairly prosperous. Yards are working full time, and they are all enjoying the benefits derived from an association. Prices range from $5.80, for salmon, to $6.75 per thousand for all hard brick. Losses from bad accounts are few, as the association will not sell to irresponsible parties without they are fully secured.

An effort was recently made to get the brick manufacturers of western New York and Pennsylvania together, and sell their product through one office. The first meeting was held at Warren, Pa., and an adjourned meeting at Bradford. The matter was then referred to a committee to devise some plan. The committee met at Jamestown, N. Y., but there was so many different interests, and it covered such a wide territory to control the sales through one office, that no definite plan was adopted. Still, one good has resulted from the meeting—they divided up the territory and fixed upon a scale of prices, with an agreement not to invade each other's districts in making sales. It will eventually lead to an association.

There is quite a large amount of building going on in spite of its being what is generally called an off year, on account of the presidential campaign. Buffalo is brushing up and getting ready for the Pan-American Exposition in 1901.

The Niagara Falls Brick Company and the yard at La Salle sold all the brick they had, and the first named yard had to work into the month of January this year in order to get brick to fill orders. In fact, they bought from the Buffalo Brick Association to complete one contract.

E. G. Reisterer, of Tonawanda, has started up his yard, with bright prospects ahead. They have one Martin machine, racks, and three up-draft kilns with permament walls, and make 22,000 brick for a day's work.

I visited the Attica brickyard recently, and found their brick were all sold. They had a kiln of about 300,000 on fire nearly ready to close, and another kiln set half full and racks full. They use a twenty-five horse-power gas engine. It costs about 35 cents per day, and no engineer, smoke, dust or any ashes to cart away. They mold the word Attica on all their brick, to show that they are not ashamed of them. More anon.

NORTON.

Another Rumbling Sound.

EDITOR OF THE CLAY-WORKER:

We like the gracious spirit of Mr. Blair's letter in the May number of The Clay-Worker. Class me, if you choose, with the doubting Thomases—still one of the disciples—but not among the unbelievers. We believe in vitrified brick as a paving material. We confess to a feeling of sympathy either for or with all doubters. They are the builders of the temple of truth. One of the most profitable warnings of Scripture is: "Let him who thinketh he standeth take heed lest he fall." There is a fine picture of a doubter in Tennyson's "In Memoriam."

"He fought his doubts and gathered strength,
He would not make his judgment blind;
He faced the spectres of the mind,
And laid them: Thus he came at length

To find a stronger strength his own,
And power was with him in the night;
Which makes the darkness and the light,
And dwells not in the light alone."

We are slow to admit that our plans are perfect, knowing that in so doing we would close the gates before us and could make no further progress. But let us consider Bro. Blair's effort for our conversion.

"The one fact that the expansion is as much as we say it is." How much do you say it is? You do not know. No one knows. Considering the great value of the material, the amount of money invested in the business, the skill required in manufacturing and in the construction of pavements, the neglect to determine scientifically their expansion is inexplicable. Common brick has been considered a superior building material, not only because it withstands the action of heat, but because it expands and contracts less by heat than any other material. But Bro. Blair says "that the expansion demonstrates the real merit of vitrified brick as a paving material." "A corrupt tree cannot bear good fruit." Whatever expansion and contraction there is in a brick pavement is certainly objectionable. We cannot determine from Mr. Grimes's essay, or from the remarks of any one in the discussion, anything definite in regard to the amount of expansion. The speakers impressed me with the idea that the expansion is—is simply awful across the street; but lengthwise of the street the expansion was hardly worth mentioning. One would suppose that a brick pavement would follow the

law of expansion—"expand alike in all directions." We believe it does. Mr. Grimes says of the pitch joint that it does not bind the brick pavement to the curb, "allowing the longitudinal expansion freedom of action, which will expand itself at the ends of the street, or vibrate back and forth, doing but little damage." And he modestly adds: "This, however, is somewhat theoretical." We are not prepared to admit that this expansion will do but little injury and believe that, if it is possible, we should provide against it. If the elastic cushion provides for all expansion across the street, why not use it to provide for longitudinal expansion also? Why not have a pitch joint across the street every ten feet of its length? If the expansion "extends to the end of the street" the subsequent contraction must break the cement joints somewhere. If the cement joint is broken in any place the water will penetrate to the sand cushion and freezing will cause an upheaval. The low places in a brick pavement indicate that a process of disintegration has been going on with each succeeding freezing and thawing. The sand cushion finally becomes saturated and is forced up between the joints and the brick settles to the concrete. We use the cement filler in order to make an impervious roadbed. It must be evident to every thoughtful person that if we cannot maintain its imperviousness then the frost will destroy our work. To make the pavement perfectly impervious every joint should be filled from sand cushion to surface. Is this done with uniformity? Water will pass quite freely through a joint that a filler "of the consistency of thick cream will not." The sand cushion between an impervious brick pavement and the impervious base is like a seam in a brick, a flaw for the gathering of moisture, and the destructive action of frost. We have been told that the water gradually passes through the concrete; but the more porous the concrete the sooner it will be disintegrated by the frost.

We read in the June number of The Clay-Worker that the present president of the American Society of Municipal Improvements "made the general statement that he considered a Portland cement filler to be a complete failure." We are not willing to admit this, for we have had satisfactory evidence that it has been used successfully. Failures have been owing to the causes above stated—to water passing through imperfect and broken joints and freezing in the sand cushion. Are we not irresistibly led to the conclusion, that if we cannot make a perfectly impervious pavement we should in some way drain the sand cushion? This may be done through perforations in the concrete or by making the concrete in blocks. We leave the subject to those practically interested. Let no one through The Clay-Worker seek my conversion. I am, and always will be, an ANXIOUS INQUIRER.

Tecumseh, Mich., June 1, 1900.

The Construction of Water Tanks.

EDITOR CLAY-WORKER:

In regard to Mr. Cram's inquiry relative to cement water tank:

As Mr. Cram does not say whether this tank is above ground or built on the plan of a cistern, it is somewhat of a question as to what causes the tank to leak. I once built a large cistern and the mason who laid the brick, failing to tamp the dirt firmly back of the brick to make the wall firm, I found upon filling the cistern, although the cement was of the best, that the water leaked out. Upon investigation, I found the pressure of the wall from the inside, which is practically one-half pound to the square inch for each foot in height, had overcome the resistance of the brick wall without proper backing or tamping. The result was the very small cracks which were almost imperceptible when the cistern was dry.

If this tank of Mr. Cram's is above ground, and is of any great size, the pressure is probably enough to spring the wood, and, of course, the cement will have to give also, thus allowing the water to leak. If the tank is set in the ground, it should be thoroughly tamped, or, better still, grouted with gravel and cement outside and next to the surrounding earth to brace the walls.

A better plan would be to take the lumber now in the tank and make a round tank of it and bind it with iron hoops. No doubt our inquiring friend has seen tanks built in this way. In my neighborhood, before we commenced the erection of small water plants for household purposes, most of the house tanks were built as is Mr. Cram's, but lined with sheet copper, making quite an expensive tank. In my own house, I simply placed a sheet copper pan on the floor in order to save the first drippings and set an ordinary round wooden tank inside, or, rather, upon this pan. It has never leaked a drop since the first day or so.

Another plan I have found to work well in repairing old tanks is to put a coat of hot pine pitch upon the inside. This must be done when the wood is dry, as otherwise the pitch will scale off.

I am not much of an expert in the matter of cement, but I should say if our friend has used the best of cement, with sharp sand in right proportions, his tank should not leak, provided the wood work is properly braced. When one realizes the immense pressure in a tank, say, of 10,000 gallons, practically eight pounds to the gallon, making 80,000 pounds weight of water, is it any wonder that it requires good substantial walls to hold it.

Cement, as we get them here in the East, are of the same colors as our friend mentions. The poorer grades are of a dark shade, but the best grade is of a light color. The more I think of his trouble, the more I think his wood work springs out of place with the pressure of the water.

A round tank can be built by any carpenter. For a large tank, say 10,000 to 20,000 gallons, the staves should be three inches thick, with same thickness for bottom. Groove the lower end of stave, say, 4 inches from bottom end, 1 inch deep by 2 inches the other way, and have the edges of stave planed to a gauge to suit the circle, with a draw of 1 foot, or, rather, to be understood plainly, I should say 1 foot smaller at the top than at the bottom for a 12-foot stave tank. Use at least 9 iron or steel hoops—bottom ones 3-16x3-inches, top ones 1-8x2½ inches. This, for a tank of 12x12 feet, holding slightly over 10,000 gallons. Smaller tanks can be made of 2-inch or 2½-inch stuff. I prefer cypress or cedar, as they last longer. In fact, it is said that cypress will never rot. Place above ground on a good, solid foundation, perfectly level, and it cannot leak.

There is hardly a large building in New York city to-day that does not have a large round tank on roof, or top floor, to supply water, for the reason that the water pressure is so weak during the day time that city pressure cannot be depended upon to keep up the supply. These tanks are principally of wood and built on plan just described and do not leak.

Sincerely hope this will help our Western friend in his trouble, and, as well, other readers of The Clay-Worker.

W. R. O.

Clay in Boiler Furnace Construction.

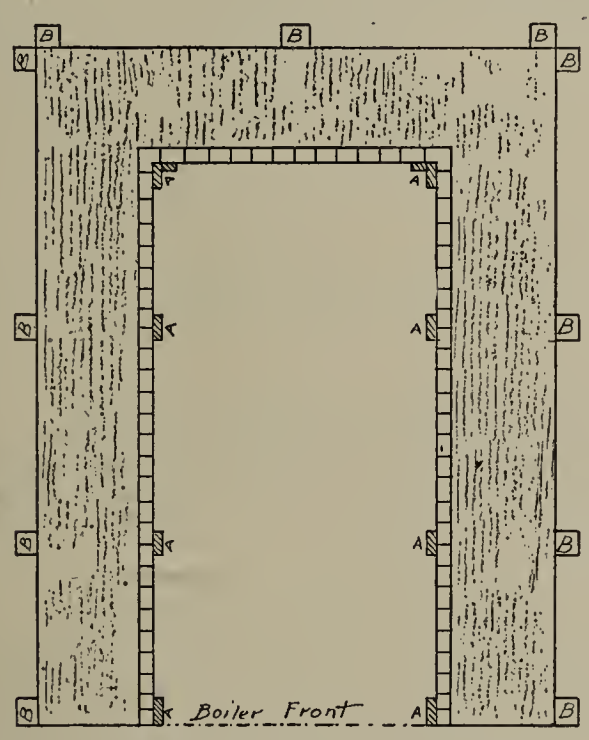
Editor CLAY-WORKER:

The construction of the boiler furnace used to be quite an item in some of the back-country steam-power industries, and particularly so when at a distance from brickyards or sandstone that could be used for this work. Where sandstone could be found for the body of the wall it has been a practice at back country points to order with their steam boiler enough fire brick to line the firebox part of the furnace, and possibly a full wall lining, and the body of the wall would be built out of stone and mud. In the back-country swamp districts, where there was no stone, and only little mounds of clay here and there, the portable or firebox boiler obtained, for it was considered too much of an undertaking to get material for walling in the stationary boilers. From this condition, particularly in

the sawmill lines, there have grown up some experiments in the use of soft brick and clay in boiler furnace construction that we may wonder did not develop long before it did.

The first experiments in this line probably came from the cracks and air leaks in thin stone walls, which were doctored by being boxed around on the outside, twelve to twenty-four inches away from the wall, and the space being filled with clay and rammed down. Next, there was a moistening of the clay during the process of such filling in, that it might pack better and not powder and work out during use. Then some one made a bold stroke; reasoning that, if the clay was what was doing the good, the stone in the wall was an unnecessary adjunct, he concluded to try an experiment with an inner wall of fire brick only, and make up the balance with damp clay alone. Now, the inner wall of brick would not stand of itself during the process of tamping in the clay, and it became necessary in this experiment to plank up the inside of the furnace during construction. Of course, this inside planking must come out, but getting it out was a very simple question, as we shall see from the practice. For the inside planking, studding about two inches thick is stood along the sides of the boiler, and to the outside of these is tacked some old cull inch boards. This will make the distance three inches from the boiler to the inside of fire brick wall.

A better idea of this work can be had by making a study of



the ground plan of such a furnace. The posts A are let into the ground at the bottom end enough to hold them from being displaced while construction is going on, and they, with their outside casing, should fill up just the space wanted between the boiler sides and the wall, their upper ends resting against the boiler for support. The posts B are put up substantially, for they are to remain as a support to the clay wall, and may well be exended up above the boiler and cross-tied at the top. In carrying out the construction the fire brick are laid up tight against the inner planking, and the space intervening between them and the outer planking is filled with clay. Eighteen inches would seem to be space enough to fill in with clay, but often two feet and two and a half feet are used. The wall is carried up uniformly all around, a few inches of loose clay being thrown in, then moistened, and often sprinkled with salt, and rammed down tight with a maul. That this makes a good boiler wall is demonstrated by the fact that some good and thoroughly practical mill men are using such a wall to-day, even where stone can be had for such work by only hauling a mile or such a matter; but what I want to get at particularly are some things that grew out of this.

Sometimes fire brick were hard to get at some country points, and the question of getting even an inner wall seemed to give trouble; then some got to trying experiments with ordinary red brick, and went one better yet by getting from the brickyard such as had not been thoroughly burned, remarking that they would get all the burning necessary right in the boiler furnace. Where sawdust was used for fuel this kind of a furnace did very well, and the idea of the clay getting all the necessary burning right in the boiler wall found root, and another step was tried. Instead of having an inner wall of brick, the clay was mixed to a stiff mud and the wall made up entirely of clay. Now, I haven't told you what goes with the inner plank wall, but it is very simple in each case, for the first fire that is made in the furnace takes this woodwork out of the way.

None of these experiments are considered as factors in modern furnace construction in a strict sense, but come under the head of "kinks"—the things that are often a help to us under situations and conditions that render their application advisable, and they are given with that understanding, and are taken from "life," for they have all come under my personal observation.

I. TINERANT.

Couldn't do Without the Clay-Worker.

EDITOR CLAY-WORKER:

There has been a splendid trade in the brick line here this season. We have burned a kiln of 80,000, and are now building a round down-draft kiln of like capacity, which we expect to finish now soon.

I want to express through The Clay-Worker my gratitude to Mr. Horace Miner, of Lewiston, Ill., and Messrs. Hnghes and Martin, of this place, for the plans for building our new kiln. These men are practical brickmakers, and have had considerable experience in building and burning round down-draft kilns, so I knew their advice could be relied upon. "A friend in need is a friend indeed."

I am more than satified with out change from wood to coal for burning our brick. The latter fuel, we have found, is cheaper for us, both in labor and cost of fuel.

The Clay-Worker improves with each issue, and I hardly know how I could get along without it. With best wishes for your continued success, I am JAMES H. HORNER.

Astoria, Ill.

PITTSBURG AND VICINITY.

THE JOSEPH SOISSON Fire Brick Co. of Connellsville, Pa., has lately made a number of additions to their already extensive plant, and the firm is now busy on large orders and their regular work.

The fire-brick works of the Harbison & Walker Company is among the busy brick firms of this city at present. This firm is filling some large orders for brick to be used on the big manufacturing plants now being erected in the Pittsburg district. They are just completing an order for 12,000,000 silica brick, received some months ago from the Dominion Iron and Steel Company, of Cape Breton, N. S.

Kier Bros., of this city, are operating their extensive brick plant to its full capacity. The firm is also filling many orders for fire brick.

The Manown Manufacturing Company is one of the leading brick manufacturing concerns of Pittsburg. Like most of the manufacturing concerns in the Pittsburg district this firm is very busy at present.

The Wallaceton Fire Brick Company, of Wallaceton, Pa., is at present operating its new plant to its full capacity, and turning out an excellent quality of fire brick.

The Stuart Fire Brick Company, of Pittsburg, which concern operates a silica brick plant at Farmington, Pa., is supplying silica and fire brick for manufacturing purposes to a number of concerns which are now erecting new plants about Pittsburg.

The work on the new plant of the American Steel Co., on Neville island, in the Ohio river, is giving a market to many local brickmakers. The mammoth new plant now under construction there will require many million brick.

The use of asphalt and fire brick for paving purposes is re-

ceiving more attention in Pittsburg of late than formerly. The use of stone blocks for such purposes was long continued on the plea of durability of the material. Recent extensive contracts let by the city officials give asphalt the preference over all other substances.

A deputation of Porto Rican business men recently visited this city to place orders for manufactured articles, and, among other contracts placed, were several for fire brick and for silica brick.

F. B. and J. H. McFeely are among the extensive brick manufacturers of this city. This firm has lately received some big orders for fire brick.

As a result of the recent disastrous fires in this city, orders issued by the city building inspector will require the greater use of fire brick in future building operations in order to more fully insure against the repetition of the late disasters.

The construction work on the new union depot, in this city, will be begun shortly. The building, when completed, will be one of the handsomest brick structures of its kind in the country. The new Pittsburg & Lake Erie depot, which has just been completed here, is built entirely of fire brick and is a handsome structure.

A. F. Smith & Co., of New Brighton, Pa., are at present operating their brick plant to its full capacity.

Among the prominent silica brick manufacturers in Western Pennsylvania are Reese, Hammond & Co.; the Ligonier Silica Brick Co., A. J. Haws & Son, and the Kingston Silica Brick Company. All these concerns are busy filling orders from all parts of the country. Other silica brick fields are being developed in the mountains of this section and a number of new concerns will shortly enter this branch of the brick trade.

Booth & Flynn are at present operating their brick plants to their limit in order to supply the orders for the product recently received. This firm is extensively engaged in the paving and building business in Pittsburg.

The Witmer Bros.' brick works, located at Witmer Station, on the Pittsburg & Western road, is one of the model building brick plants of this district. The firm is a busy one at present.

A new company has recently been formed to operate the Savage Hill fire brick plant, located at Fairhope, Pa. The officers are I. H. Brownfield, president, and G. B. Burchnal, secretary and treasurer. This plant is equipped with the latest machinery and has a daily capacity of 20,000 bricks. Four new kilns of the down-draft type are about completed and silica brick machinery is being installed. Coke oven bricks and shapes will be a specialty of the firm.

W. H. Wynn & Co., the West Decatur, Pa., fire brick manufacturers, have about completed several additional kilns and are making other additions to their plant.

The Clarion Fire Brick Company is a newly organized concern of this city which will manufacture fire brick of all shapes and sizes. Messrs. H. McLain and E. S. Cromer, as well as other well-known Pittsburgers, are interested in the new concern. Work on a new plant at Clarion, Pa., has been begun.

GILBERT.

NOTICE OF LETTING CONTRACT.

Notice is hereby given that the Common Council of the city of Columbia City, Ind., will, upon Monday, July 30, 1900, between the hours of 7 to 10 o'clock p. m., at the council room, receive sealed proposals for the construction of the following improvements in said city, to wit: To grade and pave with brick, Jefferson street in said city, from Chauncey to Main street, Chauncey street, from Van Buren to Market street, Market street, from Chauncey to Main street, and to place curbing on each side of said paving. The width, kind and manner of construction of said improvements are shown by the plans and specifications therefor now on file with the city clerk, at whose office they may be inspected by intending bidders. Said work must be done in strict conformity to said plans and specifications.

The said Common Council expressly reserves the right to repect any and all the proposals which may be made for said work.

By order of Common Council of said city.

July 4, 1900. BENJ. F. MENAUGH, Mayor.

NEW YORK BUILDERS HARMONIOUS.

—The Mason Builders and Bricklayers to Avoid Strikes by Arbitration.—

After a delay lasting for many weeks, the Mason Builders' Association and the eight local unions of the Bricklayers and Masons' International Union have reached an agreement which averts the threatened trouble in the trade in this city over a question of wages and other rules. Session after session has been held by the committees having the agreement in charge, but it was only recently that a chance occurred for a settlement.

The bricklayers held out for a long time for 60 cents an hour, but the final price agreed upon was 55 cents an hour, in view of certain other advantages granted the unions by the Mason Builders' Association. The main clause in favor of the builders is that no strikes will be ordered, and work will not be stopped upon any job because of a grievance. All grievances must be referred to a board of arbitration, and during consideration by this board work will continue.

OBITUARY.

James H. Beggs, a Pioneer Brickmaker of Wilmington, Del., Passes Away.

James H. Beggs, one of the best known business men in Wilmington, died at his home, 1009 Jefferson street, July 3, after a long illness. Partial paralysis affected him about seven years ago, and, though he partly recovered, he was never well again. He had been confined to his home since August last.

Mr. Beggs was born in Wilmington on October 12, 1832. He learned bricklaying, and in 1854 began business for himself as a contractor and bricklayer. Later he became a brickmaker, and in 1865 formed a partnership with Benjamin Newlin, under the name of Newlin & Beggs, which continued until the death of Mr. Newlin.

In 1882 Mr. Beggs formed a partnership with John P. Allmond under the name of James H. Beggs & Co. In 1887 the Delaware Terra Cotta Company was formed by Messrs. Beggs and Allmond, with their sons, and in 1891 the two concerns were consolidated under the name of the Delaware Terra Cotta Company, and so continues. In 1872 Mr. Beggs was elected by the Republicans to represent the Seventh Ward in the City Council. He was a member of Lafayette Lodge, A. F. A. M., and Washington and Lafayette Chapter, R. A. M.

Mr. Beggs' wife and seven children, Mrs. Willard S. Pyle, Mrs. W. Riley Deeble, of Washington; Miss Mary C. Beggs, Miss Caroline S. Beggs, James H. Beggs, Jr., Scott and Albert Beggs, survive him.

American Machinery Popular Abroad.

J. D., Fate & Co., of Plymouth, O., reports sales of brick and tile machinery to several foreign ports, and their shop superintendent, Mr. M. Bistline, is now on his way to London to superintend the erection and starting of a line of their machinery at the works of the London Brick Co. From there he will go to Berlin, Germany, where another brick and tile plant will be installed. They also recently shipped an outfit of machinery to South Africa.

Other People's Mail.

A new postoffice rule has just gone into effect imposing a fine of $500 or one year's imprisonment on any one who, through carelessness or otherwise, takes mail not belonging to them from the office and fails to return it at once. This applies to newspapers as well as letters and other valuable mail. People when taking their mail from the office should examine it before going out of the building; it will take but a moment, and will save a deal of trouble; to say it was the postmaster's fault will cut no figure under this ruling.—Exchange.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SEVENTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIV. JULY, 1900. No. 1.

CURRENT COMMENT.

The usual midsummer dull season is upon us. Yet there is a reasonable amount of building work under way. Here in Hoosierdom almost every brick and tile plant is running up to capacity, and sales are averaging well up to output, as a rule.

* * *

Our able New England scribe, Brian J. Dunn, who has gained the affections of our readers by his charming stories and brickyard rhymes, was married July 3, at Bangor, Me., to Miss Mary Donovan, of Boston. If good wishes can avail, long life and happiness will be their lot.

* * *

Expansion, like all things mortal, brings its responsibilities and burdens. These will be borne bravely by the masses, and when the battle and strife are done the results will prove, as in our civil war, that the end justified the struggle. The nation, like the individual, has its mission, and it will fulfill it.

* * *

The situation in China is indeed most distressing. Each new dispatch tells of a condition more horrible than any one supposed possible, even in that heathen land. The end now seems far off, and, while it may be safely predicted that the allied forces of civilization will conquer ultimately, it will be at a cost of life and treasure far beyond present comprehension, but the world must advance, be the cost what it may.

* * *

These are busy times indeed at Galesburg, Ill., where more of Mother Earth is being made into paving brick than at any other one place on the globe. The June shipments of the Purington Paving Brick Co. alone aggregated a little more than eight and a quarter million pavers, the largest month's work in the history of the company. This is a record hard to beat, but there is no telling what the Puringtons may not do. Some of our mathematically inclined readers may find it interesting to figure out the distance these brick would reach if placed in a line end to end, or side to side, etc.

* * *

The second summer meeting of the American Ceramic Society is to be held at Niagara Falls, August 1, 2 and 3 next. The first session will be held Wednesday at 8 p. m., in the parlor of the International Hotel. While a formal programme has been arranged, there will be but one or two formal papers. The proceedings will consist chiefly of informal discussions, committee reports, etc. The chief purpose of these summer meetings is social intercourse and recreation. As those of our readers who have ever attended a clayworkers' convention well know, wherever enthusiastic clayworkers gather shop talk is inevitable and incessant. The trip to Niagara will enable the members of the Ceramic Society and their friends who meet with them to indulge this propensity under very pleasant conditions. Those who desire to participate are requested to notify the secretary, Prof. Edward Orton, Jr., Columbus, O., who will cheerfully give any further information desired in regard to the trip.

APARTMENT BUILDINGS.

There has been quite a boom in apartment house building in our city. A number of these structures were started last spring and it was thought they would affect the brick market. It has developed that they made little impression, the amount of brick consumed being much less than at first anticipated. The large number of openings in fronts, the frame and galvanized iron bay windows and the absence of any large number of brick walls in the interior make them little if anything better than frame structures. As a matter of fact, they are virtually frame buildings faced with brick. Brick used thus lend little to the quality of a structure, though they do add stability to the appearance of the building.

PRICES OF UNION WORKMEN.

The most iniquitous thing in reference to prices paid to union labor, through the influence of labor organizations, is that one man is supposed to receive as good a price as another. It is taking away the ambitious incentive to do good work and plenty of it. The spirit of the union has been to bring each workman to a condition to be expressed by a unit, each unit of course having the same value. The condition of the human mind and human ambition is against the success of any such undertaking. And it is a thing that cannot last because it is wrong and unjust. We find in every walk of life men and women are unequal in capacity and ability. The lowest cannot be brought to the medium level any more than the highest to the medium. The effort of trade unionism to bring all to a common medium level is unnatural, and because it is unnatural it is impossible. Artificial structures may have a certain sort of success for a time, but in time right will prevail.

SCIENCE IN CLAYWORKING.

On a preceding page appears a valuable document on the subject of science in clay working. Does it not occur to all of us that in any industry or in any work or business where there is success that there must be scientific method and scientific developments. At one time it was thought that science related only to the theoretical arts, the theory of chemistry and the theory of the laboratory, which did not

take active place at all times in the commerce and trade of the world. As it is, however, through the development of the scientific method of investigation, science has come not only to be a part of business in relation to manufacturing, but business is a science, and science is a business. In some of the countries of the old world scientific methods are now being used in the administration of public affairs, the organization of municipal governments and the carrying out of the practical and physical affairs of the cities and the management of the schools and everything that relates to comfortable and convenient living.

THE BRITISH FIRE PREVENTION COMPANY.

One of the most prominent and successful organizations looking to public good is the British Fire Prevention Company. Its published reports are edited by Edwin O. Sachs and is administered by him, assisted by a very capable corps of scientists and practical workers. We have referred to these reports before. The company has investigated the cause of many fires and has set forth the lessons to be taught from them. Conspicuous instances of this kind relate to the Paris Bazaar fire and the Horn fire in Pittsburg in the general statement of conflagrations during the last ten years.

This organization has gone into details relating to tests of all kinds of material, terra cotta, brick, wire glass, cement and many other materials. They do this work in an exceptionally practical and thorough way, not alone through the study of actual fires, where the temperature may not always be known, but oftentimes in especially constructed buildings where exact data may be secured and all facts actually known.

This organization appears to be well equipped, not alone with money, but with brains.

PRICES OF BUILDING MATERIALS.

There has been no material change in the price of brick throughout the country during recent months. The metal market has seen quite a decline, lumber has fallen some, and many other lines of material can be purchased for less than during the early months of the year. There is less cause for a decrease in the price of brick, for this reason, that there was less advance in the cost of brick than any other building material. A declining market is almost as discouraging for the sale of building material as a rising market. What is wanted most by those selling any kind of building materials is a stationary market. It would have been better for the building interests of this year if prices had been maintained. One who builds for investment does not like to feel that the price he is paying may be lower a little later. On the other hand, if the prices are advancing, the tendency is to close contracts before a still higher price is asked. There is a general belief that present prices are about right, and that there will be little if any change during the balance of the season. This we regard as favorable, for a stable market is the best market.

THE BRICK MARKET.

The demand for brick continues strong the country over, though there is less activity in building lines in many of the large commercial centers. This is attributable to local conditions in most cases. For instance, in Chicago it is due to labor troubles among the builders and their employes. At St. Louis the street car strike has had a depressing effect upon all industrial matters. Kansas City is reported to be enjoying something like a boom. The two latter cities offer a marked contrast in the method of dealing with strikers. At the later place the strikers were enjoined and traffic continued undisturbed. In the former a dilly-dallying policy has resulted in idleness and rioting that has cost the city many millions. It seems to us that the advocates of organized labor should see in this an object lesson. The interests of employes are advanced by the observance of law and order. The wage earners themselves are the greatest sufferers at St. Louis. In the East a better condition prevails, though there is some complaint in the large cities of a decrease of building projects. Some attribute this to the fact that this is presidential year. Politics may interfere some with business later on, but to date we believe it has had less effect on building lines than ever before.

CUBAN AND PORTO RICAN INVESTMENTS.

An Eastern patron requests us to give, through the columns of The Clay-Worker, information relative to the possibilities and advantages for establishing modern brickmaking plants in Cuba and Porto Rico, and asks if such a venture would, in our opinion, prove successful and profitable. From both personal observations and information from those familiar with the conditions now existing there, we doubt if either place is sufficiently attractive to justify permanent investment at this time. There is plenty of good clay available for brickmaking purposes and labor is cheap, but fuel is rather scarce and expensive. The demand for brick is not great, nor do we think it is likely to be for some time to come—at least, not so long as present methods of building prevail. But few brick buildings are found in Havana or other cities on the islands, or, at any rate, if they are of brick, they don't look it, all buildings being covered with a cement or mortar. Concrete construction is used extensively and has one great advantage, it is non-combustible. Fire rates ought to be low in Havana. From the viewpoint of the capitalist, the most unsatisfactory feature is the political or governmental situation. There is an uncertainty in this which discourages the cautious investor. A friend, a keen, observing business man, recently visited the island in an advisory capacity for several who were seeking investments. Without exception, so he says, all decided that investments were unsafe there for two reasons: First, that the administration of the United States government was temporary, and, second, that the Cuban government was not to be depended upon. Until politics are more settled it would seem that an American who has money to invest is not wise in carrying it to Cuba. The gentleman quoted insists that an investment made under an American administration would not be worth 25 per cent. of its face value under a native Cuban government. Under such conditions a modern brickmaking plant would not promise a fair return.

TRADE LITERATURE.

WE ARE INDEBTED to the Dean Bros. Steam Pump Works, Indianapolis, Ind , for a copy of their Special Catalogue, No. 38. It is a handsome little book of forty odd pages, and contains a large number of fine engravings of their Duplex steam pumps of various sorts, styles and sizes. Dean Bros. manufacture all kinds of pumps for all sorts of purposes, horizontal and vertical pumps, compound and non-compound pumps. If any of our readers want a pump of any capacity, large or small, they will do well to send for one of these catalogues, which, in addition

to the illustrations and descriptive matter, contains a series of tables giving the capacities of various pumps under varying conditions. Dean pumps are made for service, they are the "Built right, run right" kind of pumps. Copy of the catalogue can be had for the asking. Address Dean Bros. Steam Pump Works, Indianapolis.

THE CHICAGO BRICK MACHINERY CO., are sending out a unique little pamphlet illustrating and describing their "Good Luck" line of brick machinery for 1900. The pamphlet is unique, both in construction and arrangement. The cover folds in the form of an envelope, and is of heavy maroon colored paper, printed in green and gold. The address even is written in gold ink, a combination that is sure to attract the attention of the recipient and make a favorable impression, which deepens as the pamphlet is opened and the beautiful engravings of the "Wonder" line of brick machinery is brought to view. Write for a copy to the Chicago Brick Machinery Co., 225 Dearborn Street, Chicago, Ill., mentioning the CLAY-WORKER.

THE AMERICAN BLOWER CO., Detroit, Mich., has favored us with a copy of their catalogue, No. 112, illustrating and describing their well-known exhaust fans and other heating and ventilating apparatus. The catalogue contains much valuable information relative to the installation of fans, piping, etc., and a series of tables giving the capacities of pipes, and pertinent advice regarding the planning and operation of heating and ventilating appliances. The American Blower Co. will gladly send a copy to interested parties and will follow up same, if it is desired, with expert advice or counsel bearing on special heating and drying plants. The feature of the book most apt to interest our readers is that relating to their "A. B. C." Brick and Tile Dryer. For full particulars, address them as above.

THE BATTENFELD MFG. CO., Cleveland, Ohio, are sending out a neat folder illustrating and describing their new "Dictator Automatic" Brick Machine. The principal illustration is the same as that shown on page 51 of this issue, by which our readers will see that they are offering the trade a new machine by which a repressed stiff mud brick is turned out at the rate of 25,000 to 40,000 per day. The machine has a number of novel features which they will be pleased to explain to interested inquirers.

A GLORIOUS FOURTH.

Little Adelbert arose at four
And crept down stairs to the big front door
And down the walk to the garden gate,
And there he started to celebrate.
With bursting cracker and roaring gun
He wakened the neighbors, every one;
He scared the cat out of all her sense
And blew the slats off the picket fence
And came to breakfast with one black eye
And said, "Hooray for the Fourth of July!"

He ate with hurry and frantic haste,
For never a minute had he to waste;
Then out again to the fray he sprang
And turned things loose with a mighty "bang!"
He fizzed and spluttered and boomed and crashed,
While dishes rattled and windows smashed,
And when, all grimy and sore and lame,
Torn and tousled, to lunch he came,
On his swollen lips was the joyous cry,
"Ain't I glad it's the Fourth of July!"

All that day, till the twilight's close,
The powder smoke from the garden rose;
All day long in the heat and dust
Little Adelbert "banged" and "bust,"
Till, just as the shadows began to creep,
He blew himself in a senseless heap.
Burned and blistered and minus hair,
They brought him in for the doctor's care,
But late that night he was heard to sigh,
"I wish every day was the Fourth of July!"

—Joe Lincoln in L. A. W. Bulletin.

TABLE OF CONTENTS.

The Royal Saxon Porcelain Manufactory 11
Publicity and Happiness 15
Brickyard Economy 16
Brick Pavements of Newark, N. J. 17
Changes In Building Material .. 20
The Webster and Nephew Plant 21
Exact Instruments for Clay-workers 22
The Raymond Horizontal Stock Brick Machine 23
La Brique 24
The Brieklaying Machine a Myth 28
Button-Hole Talks 28
The Ceramic Association of The Ohio State University .. 29
Brickmaking In Mississippi .. 30
Science In Clayworking 32
Philadelphia Bricklets 34
Reveries of A Satchelor 34
Fire Brick: Their Manufacture and Uses 35
A Modern Clayworking Factory 36
Notice of Letting Contract 40
New York Builders Harmonious 40
Obituary 40

CORRESPONDENCE.

Capital Brick and Building News 25
The Chicago Situation 27
Notes From Detroit 30
A Correction 37
Cincinnati Brick News 37
The Brick Interests of Western New York 37
Another Rumbling Sound 37
The Construction of Water Tanks 38
Clay In Boiler Furnace Construction 38
Couldn't Do Without the Clay-Worker 39
Pittsburg and Vicinity 39
The New York Brick Market .. 46
Pacific Coast News 48
Down in Jersey 50

EDITORIAL:

Current Comment 41
Apartment Buildings 41
Prices of Union Workmen 41
Science in Clayworking 41
The British Fire Prevention Company 42
Prices of Building Materials ... 42
The Brick Market 42
Cuban and Porto Rican Investments 42
Trade Literature 42
Editorial Notes and Clippings. 52

MISCELLANY:

Always Better to Condense 16
Economy of Power 25
A Home Comfort Swing 33
Don't Worry—Things Will Go On 36
A Glorious Fourth 43
Not a Good Substitute 48
It Broke His Heart 50

Index to Advertisements on Front Inside Cover Page.

FOR SALE—A whole or a controlling interest in a face brick plant, situated on a main-line railroad in southern Ohio. There goes with the property over 250 acres of coal and clay land. The clay and coal are above factory level and are assembled down hill. A horse can be driven anywhere in the mines. The clays are developed and suitable without mixing to make the finest mottled flashed brick in the world, and a successful manufacturer will associate himself with the enterprise. There is a market for the product at remunerative margins from Maine to Minnesota and from Canada to the Gulf. Address all communications to J. C. B.,
Care Clay-Worker.

A Distinct Triumph.

In competition with the best manufacturers of Europe and other American makes, the

Cross Oil Filter

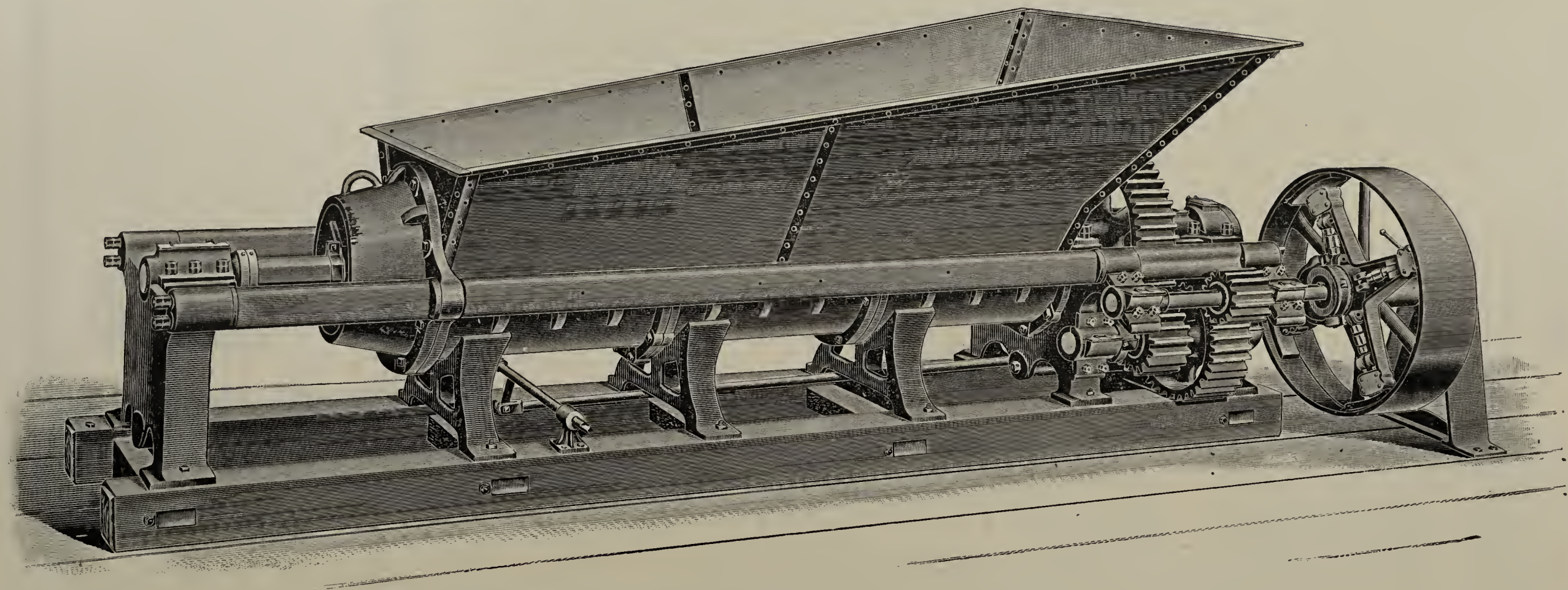
Has been selected for the equipment of the Imperial Steel Works, owned and operated by the Japanese government. This plant is probably the most perfect of its kind in Japan. We guarantee these Filters to save 50% of oil bills and back our guarantee with a trial at our expense. Catalogue 43.

The Burt Mfg. Co., Akron, Ohio, U. S. A.

Largest manufacturers of Oil Filters in the World.

A Clay Granulator that will Granulate Clay,

IS WHAT WE OFFER YOU.



Raymond Ten Foot Clay Granulator.

We also build a full line of Auger Machines, Automatic and Hand Cutting Tables, Automatic and Hand Re-presses, Pug Mills, Dry Pans, Wet Pans, Clay and Ore Separators, Soft Mud Machines, Mold Sanders, Barrows, Trucks, Cars, Tempering Wheels, Molds, Engines and Boilers, and in fact everything required on the brickyard.

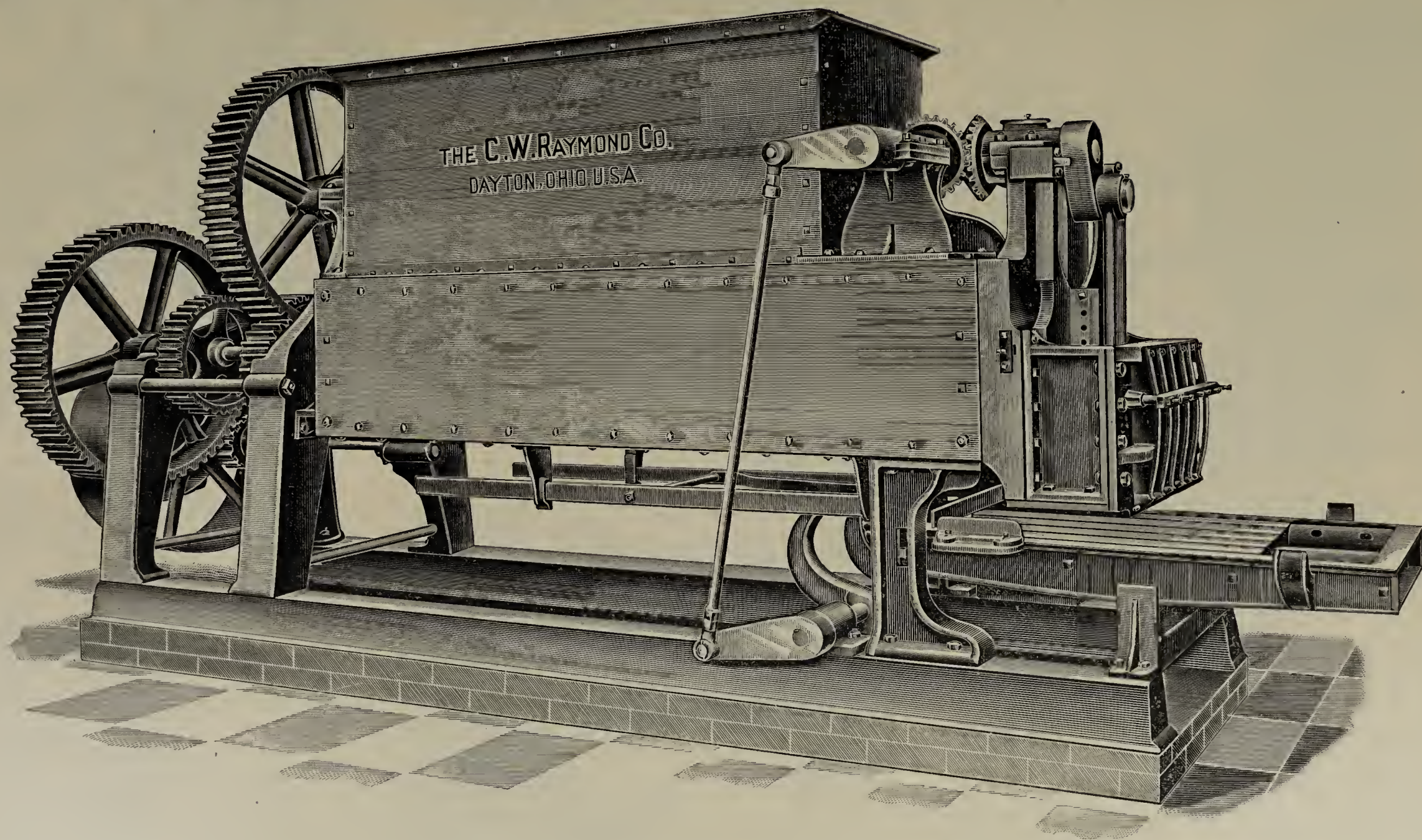
Send for our new Catalogue.

The C. W. RAYMOND COMPANY,

Dayton, Ohio, U. S. A.

AHA! HERE WE HAVE IT.

JUST WHAT YOU HAVE WANTED FOR YEARS.



The Raymond No. 1 Horizontal Stock Brick Machine.

The LATEST AND GREATEST SOFT MUD MACHINE ON THE MARKET. Weighs 18,000 lbs. All Iron and Steel. Working parts few and heavy. No springs, weights, triggers or cams. Compound geared. Maximum pugging capacity. Will press brick soft or stiff. Minimum wear. Molds fully filled out and all brick alike. Capacity 30,000 to 60,000 brick per day. Just the thing for fire brick yards or those where a heavy duty machine is required. Send for description

The C. W. RAYMOND COMPANY, Dayton, Ohio, U. S. A.

WRITTEN FOR THE CLAY-WORKER.

THE NEW YORK BRICK MARKET.

GLORIOUS WEATHER for the manufacture of brick. It is simply perfect, and will make the season of 1900 memorable in the annals of the trade as the one when the price of brick reached a very low plane early in the season.

Railroads have signs at the road crossing warning the traveler to look out for the locomotive. The sign of warning for the brick manufacturer that he should take heed was displayed early in the year, but he paid no attention to it. Just as soon as it was possible to make brick, the sound of the whistle was heard calling the men to work. Why the brick manufacturers cannot use the same judgment as do the men engaged in the manufacture of other supplies for the construction of buildings is beyond comprehension. Although early in January the number of permits issued by the building department of the city of New York showed a decided decrease as compared with that of former years, and still the brickmaker heeded not the warning and began making brick at the earliest possible moment. By the first of June some of the yards had molded the last pit, and before the July number of The Clay-Worker is issued many of the yards will be closed for the season.

—An Effort to Organize.—

A meeting of brick manufacturers is always in order, especially when the price is out of sight. It seems that the old saying of "locking the door after the horse has been stolen" applies to the brick trade. When the patient is beyond help, then a consultation is held to see if some heroic measure cannot be adopted that will bring back life. A call was sent out for the brick men to meet in Newburg to reach an agreement if possible, whereby the output might be reduced at least one-half. An agreement to this effect was signed, but it remains to be seen how many will stick to the agreement. It seems to me a better way to raise prices would be to stop shipping and hold the brick in the sheds.

In local trade cutting the price seems to be in order. It seems strange that there should be any deviation in price for local consumption. Only so many brick are used and each yard has certain customers who go to that particular yard, and no other, unless some special inducement is given in the way of reduction of prices.

—A Change of Fuel.—

The past season was the means of the horses getting a long rest during the winter, as coal does not need to be accumulated under the sheds as is the case with wood. The past three or four winters there has been a tendency on the part of the bosses to draw in less wood than formerly. There are two causes for it. The first and main cause is that they may fill the shed, which will not require many loads, and then stop, and during the summer hire teams to draw from the railroad and have it put just where it is required around the kiln, and during the week of burning have the teams draw the balance to the kilns. They find it is cheaper to follow that course, as there is no extra handling of the wood. It leaves the money in the pocket of the boss instead of the wood merchant, and the former is always in need of money.

Another cause, and the one that is plain to all, is they have no place to put the wood. Back of the pits, where the field of clay was, is all used up into brick.

This spring one of the yards opened a new bank (I am sorry to say it was not a deposit bank) where this same yard stood fourteen years ago. All the clay surrounding the old yard was converted into brick, the fixtures, like a cow in pasture, were moved on to another spot where there was clay, and in fourteen years it was all gone. At present they draw the clay about an eighth of a mile. There is another place where there are two yards owned by one man. In two years at the longest period, one of the two yards will be taken down in order to use the clay that is under it. So the yards pass away.

—A Place for Everything—

is now possible under the sheds. The burning of coal does away with the stacking of the wood in the eaves to remain in piles here and there. When a kiln was out what wood was left over would be thrown on top of some other pile, and would cover up a loot or a straightedge, or some other tool needed around the shed, ofttimes two or three or more arch doors and arch irons would be covered up. When they were wanted, there would be a loss of time hunting for them. If they could not be found, a man would be sent over to the next yard to see if they had borrowed any of the doors or irons. If they had not borrowed it, then the man would have to take a horse and cart or a wheelbarrow and borrow what was needed. After awhile when the wood was moved to another kiln the missing tools would be found. The wood pile is a handy place for the sand boy to throw his sand screen on, instead of putting it in the tool house. The next morning it has a hole in it, and he cannot use it. It is a pleasure to go into a clean shed, where everything is in its place, and there are many such yards now since the advent of coal.

This has been a short season. One of the yards in New Windsor made thirteen arches of green brick and then closed up. I heard the other day of a case where the owner of one of the brickyards refused his tenant the privilege of taking clay from the place he had been getting it for some time. The other clay was not of a good quality, and the tenant stopped making brick at once and left all brick that were in the hacks stand as they were, not battened; in fact, closed down the yard. This will probably result in a law suit, as the lease provided for good material.

The brickmakers of St. Louis should all be prosperous, if we are to judge from the figures which appeared on page 547 of the June issue of The Clay-Worker. The official record for the first five months this year shows 2,372,046 building permits issued. I presume these figures are correct. It is certainly an extraordinary showing. The brick manufacturers should be able to command a good price for their product.

—Building Permits—

issued in New York city from January 1 to June 21, 1900, figure up 890, showing a falling off of 1,622 permits as compared with the number issued during the same period last year. The cost of projected buildings in that period last year was $65,345,262, for the present year $30,773,945.

—The Brick Market—

seems to move in a settled groove. When the barges are sold and sent to be discharged, it is always a question when that will take place, as the barges make a very convenient storehouse, and one that costs the buyer nothing for storage. Could anything better be provided? If so, kindly let it be known, as the buyer likes to have everything come his way.

Last month's report was a very poor one for the manufacturer, still I hoped the price would not drop any for at least a month. Since that time the trend of the market has been a downward one, and no one can say whether or not the figures now submitted will be the bottom ones.

It is simply a question of shipping and needing the money. If sent to market they will be sold and the market is a slow one. If the brickmakers keep on shipping they will surely reach bottom. If the threatened strike takes place next month, New York will be a close second to Chicago. It is stated that all contractors in the building trade are going to cut wages 10 per cent. on all lines of work. If they do, there will be no market.

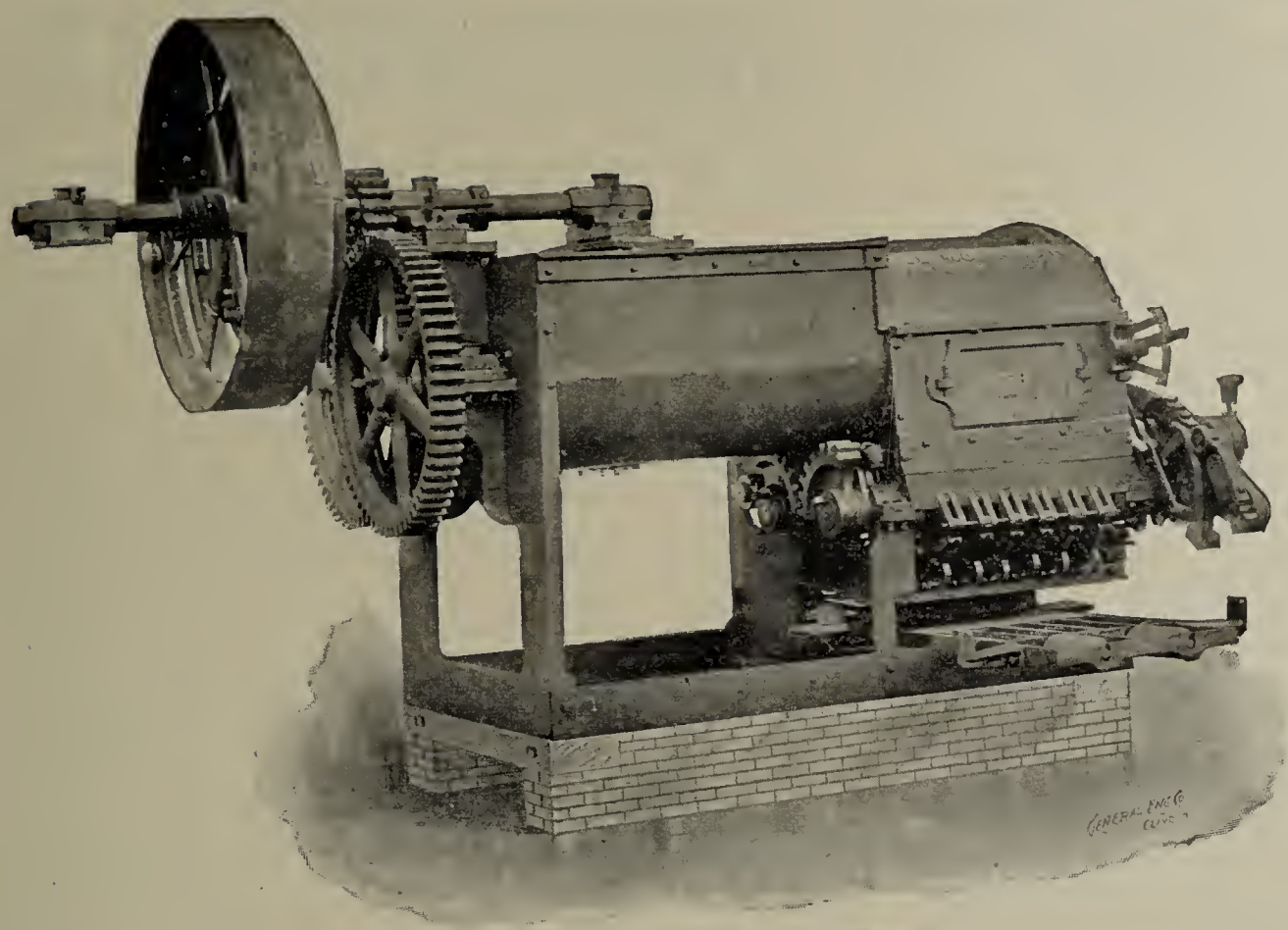
Haverstraws, $3.87½@$4.25. Special, $4.50.
Newburg Bay, $3.87½@4.25. Special, $4.50.
Up-rivers, $3.75@$4.25.
Hackensack, none on the market.
Pale, $1.75@$2.00.
Up-river yards calling for extra boats.

A. N. OLDTIMER.

Hackensack, N. J., July 1.

DURING THE HOT SPELL.

WEARY WILLIE—"Wud yer sooner freeze ter death er burn ter death Fields?"
FLOWERY FIELDS—"I'd sooner freeze ter death sech weather as dis."
Judge.



Over 75 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

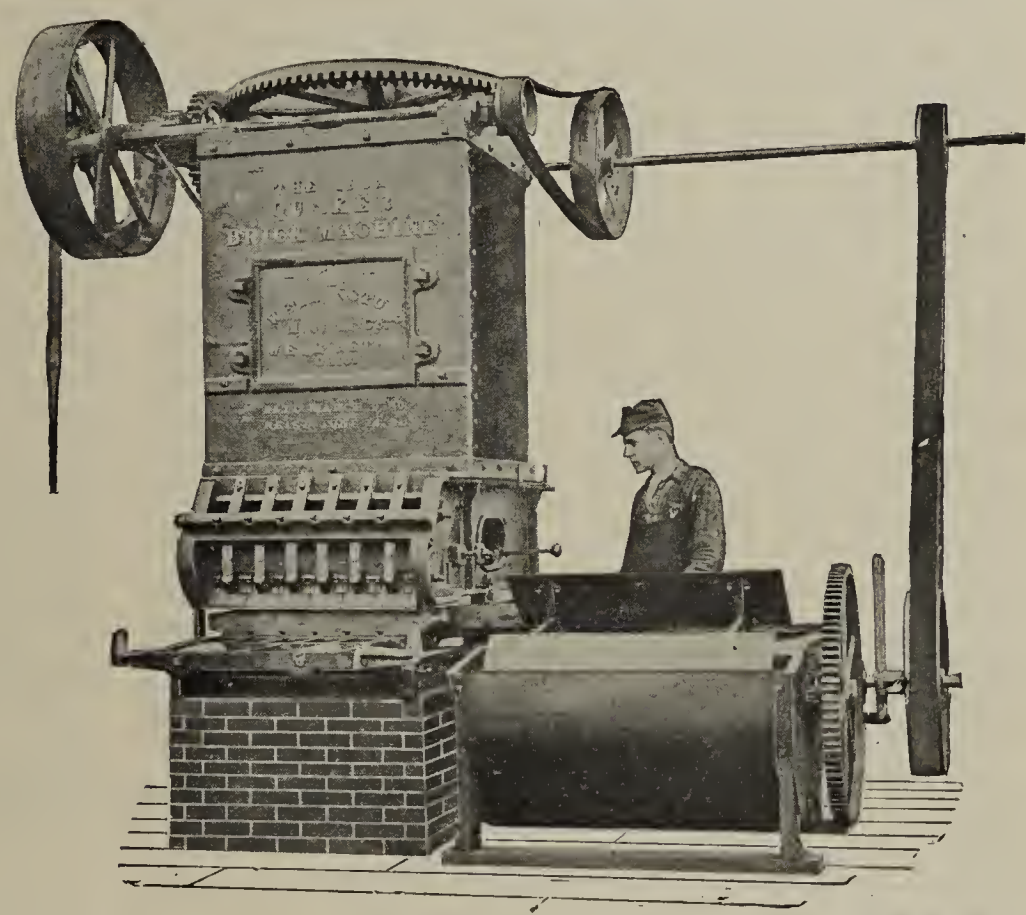
Long acknowledged the best for small and average sized yards.

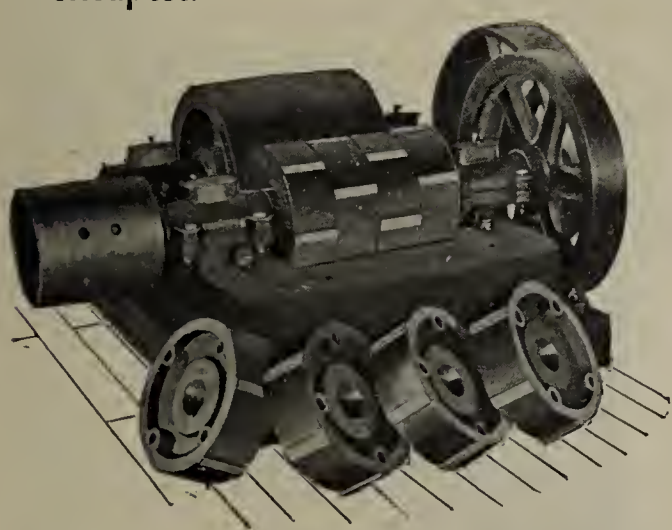
FOR 1900

We have added several new machines to our line.

Send for our 1900 Circulars.

Our mould-sander is the best, simplest and cheapest.

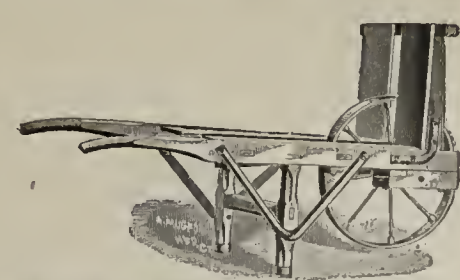


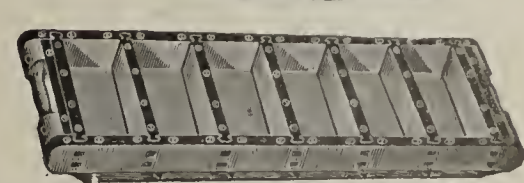


TWO Styles of Disintegrators, Solid rolls with inserted cutting bars and cutting roll made of hard sections.

MOULDS, TRUCKS, BARROWS,

and all other Supplies.





Nothing runs easier than our BALL-BEARING BARROWS AND TRUCKS.

The WELLINGTON MACHINE CO.,

WELLINGTON, OHIO.

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

LARGE QUANTITIES of sewer pipe are being shipped to the Hawaiian Islands. The sewer pipe comes from the works of Gladding, McBean & Co., at Lincoln, and Clark & Son, at Alameda, Cal.

The British bark Lord Templeton, now at Puget Sound, Wash., will take 500 tons of Seattle-burnt brick to Cape Town.

A brickyard war is now on in Southern California. At the beginning of the year a large company was formed in Los Angeles to make brick. Nearly all the yards in that city were brought into the combination, which set out with a capital of $500,000. Simons Bros., of Pasadena, did not go into the combine, as they asked $80,000 for their plant, while the combine was willing to pay only $25,000. Now the "combine" accuse Simons Bros. of cutting prices from $6 to $4 per 1,000 in the yards.

The Pacific Art Manufacturing Company has finally selected a location for its great tile factory, and will immediately begin the construction of its main building. They have secured a tract of 43 acres fronting on Tropico avenue and the Southern Pacific railroad tracks, near Tropico, Cal. General Manager Joseph Kirkham and Architect Charles Ernst have staked out the lines of the factory building, which will be 560 feet in length and 185 feet in width. The material for construction will be on the premises this week, and active work will be begun at once. The factory will have an annual capacity of 1,500,000 square feet of wall and floor tiles. When in full operation the concern will employ from 800 to 1,000 operators, many of whom will have to be brought from the East. The building will be equipped with modern machinery throughout, both as to form and construction of kilns and the kind of machinery used.

The E. B. McNear Brick Company has filed articles of incorporation in Marin county, California. The subscribed stock is $30,000, and the brickyard is located at McNear's Point, near Point San Pedro, Marin county, California. The following are the board of directors: E. B. McNear and John A. McNear, of Petaluma; James W. Cochrane, of San Rafael; Chas. Codding, of San Francisco, and John McNear, Jr., of Point San Pedro. The plant will have a daily output of 50,000 bricks.

The Slater Brick Company has been incorporated for the purpose of maintaining a brickmaking plant at Billings, Mont. The incorporators are Christopher Slater, Austin North and H. North, all of Billings. The capital is $34,000.

The old brickyard at Fourth and Eastside streets, Olympia, Wash., after a season of idleness of several years, is about to renew operations. John Grim is having the grounds overhauled preparatory to the manufacture of brick.

A new and extensive industry has sprung up in the vicinity of Redding, Cal. A company of substantial men have organized for the purpose of engaging in the manufacture and sale of brick. The new company, headed by M. W. Herron, has purchased ten acres of land about one mile south of Redding and near the railroad crossing. The soil of the tract of land is red brick clay and said to be of splendid quality. Men have already been set to work at the new brickyard. The ground is being cleared and a well is being sunk. The capacity of the first kiln, which will be completed within a few days, will be 8,000 brick per day. The brickmaking will be under the supervision of George Palmer, of Anderson, Cal.

Stahl Bros. have sold their brickyard at Kalispell, Mont., to Montgomery & Hunt, the new firm consisting of A. C. Montgomery, J. H. Montgomery and W. G. Hunt. The yards are being put in first-class condition by the new managers. A large shed, to cover the kilns, has been put up, and drying sheds to shelter 70,000 brick are just about completed. New mixing vats have been put in, and many other improvements added. About 20,000 brick a day will be made during the season.

Lawton, Ore., is to have a new brickyard, provided immediate sale can be found for at least 100,000 brick. Two parties have recently been looking over the ground and it is understood a sufficient amount of brick has been contracted to warrant the location of the enterprise.

D. A. May has leased two acres of land within a few hundred feet of the depot at Athena, Ore., and has commenced to burn brick. The first kiln of 230,000 has been burned and a second one is ready for the fire. In the opinion of experts the clay used in the manufacture of these brick is of good quality, fine grained and free from gritty substances. The product of the first kiln gave good satisfaction to those interested. Mr. May expects to burn 2,000,000 brick at Athena this season, and increase the capacity of the brickyard next year.

Mr. Stinger has purchased and is operating the Waitsburg, Wash., brickyard.

A. O. Fowler has started a brickyard at Wenatchee, Wash.

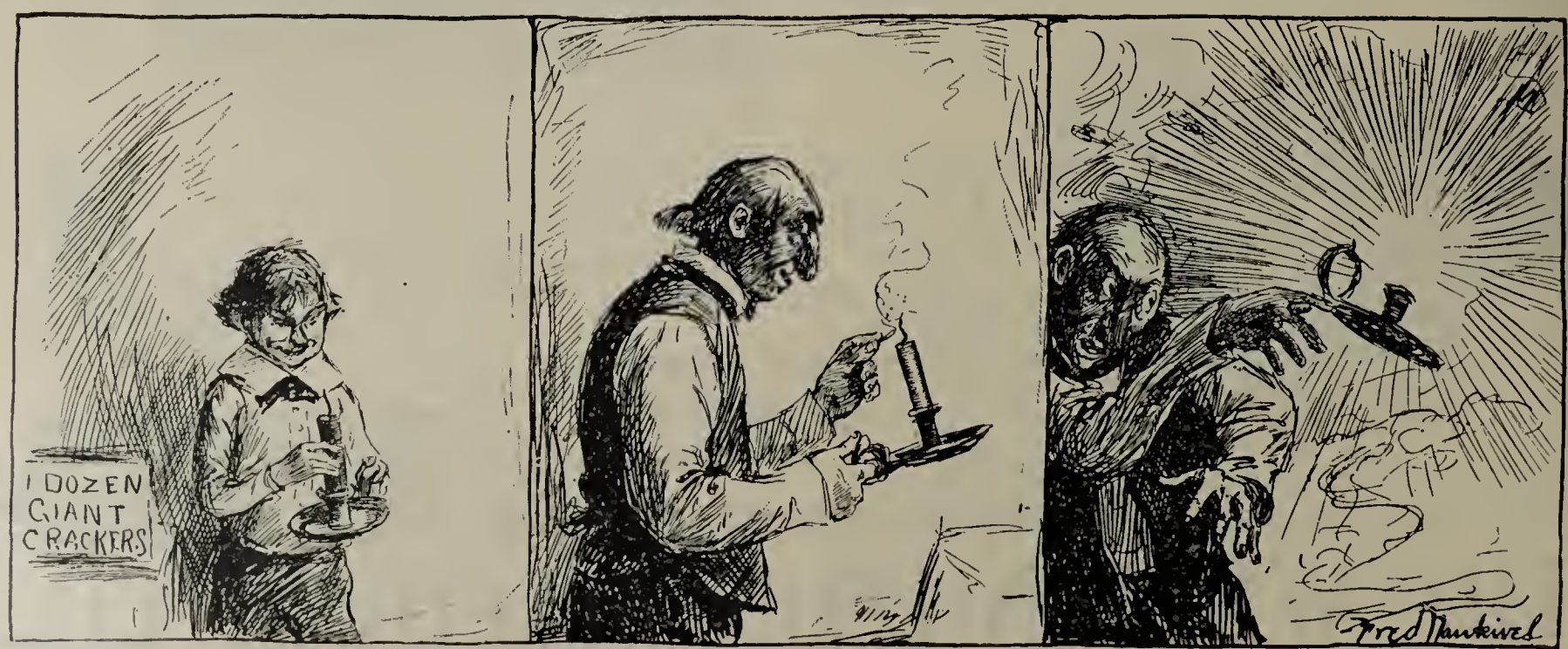
William Earley has now on hand 1,400,000 brick at his kilns on Onion Creek, Northport, Wash. He expects to continue the manufacture of brick all summer, employing a large force of men, so as to be able to supply the Rossland, B. C., and Northport trade. A large order from the Northport smelter is now being filled, with prospects of more to follow.

A. J. Gibson is making preparations to open up his brickyard, three miles south of Missoula, Mont., and has already broken a kiln of 115,000 brick, which are finding their way to different parts of Missoula county. Mr. Gibson will also start making brick in a few days, having enough orders in to keep the mill running all summer.

The builders of Salt Lake City, Utah, are complaining of a scarcity of brick and all local brickmakers seem to be behind with their orders. In connection with this, many of the brick haulers have quit to put up the hay crop, making it very difficult to get the brick hauled even when they are to be had.

SUNSET.

San Francisco, Cal., July 5, 1900.



NOT A GOOD SUBSTITUTE.

Henry substitutes a giant-cracker for a candle in grandpa's candlestick.

GRANDPA—"Candles may not make so bright a light as a ker'sine-lamp, but one thing's sure—they don't explode."

!—!!—!!!

—Judge.

WARNING!-TAKE NOTICE!-WARNING!

After more than eleven years of litigation, our rights have been broadly sustained.
Read the following opinion by Judge CLARK:

IN THE CIRCUIT COURT OF THE UNITED STATES.
FOR THE NORTHERN DISTRICT OF OHIO,
EASTERN DIVISION.

C. AND A. POTTS AND CO. vs. R. C. PENFIELD, *et al.* } No. 5371.

OPINION OF THE COURT.

CHESTER BRADFORD, for Complaint.
E. E. WOOD, for Defendants.

CLARK. J.—

In view of *Potts* v. *Creager*, 155 U. S. 597, and *C. and A. Potts and Co.* v. *Creager*, 97 Fed. 78, it is obviously, as I conceive it, a settled proposition for this court, that the patent in suit is valid, and I certainly ought not to be expected in the disposition made of this case to enter upon a new inquiry as to any question of validity. In those cases, this patent was declared meritorious and valid as a general proposition, and it was further specifically held that the sixth claim thereof was infringed. It is true that the discussion, as well as the actual points adjudicated in those cases, had particular reference to the rotating cylinder carrying cutting-bars fixed in longitudinal grooves projecting beyond the surface of the cylinder, and acting in combination with what was called a vibratory plate. It seems to me quite obvious that in both of these cases, the smooth roller in the second Potts patent substituted for the vibratory plate in the older patent, was regarded simply as the equivalent in every respect of the vibratory plate, and it was for this reason that it was simply an equivalent (possibly a mechanical improvement) that the second Potts patent was held invalid, as involving no invention in the substitution of the smooth roller for the vibratory plate. Now this being true, the question now to be determined is just such as it would have been had the smooth roller been a part of the combination in the older patent, instead of the vibratory plate. The defendant's contention is that the plaintiff's combination has been avoided for the reason of the fact that the new Penfield cylinder has been so constructed, that instead of the cutting-bar being separate and removable parts of the cylinder and adjusted in the longitudinal grooves when in use, the cylinder and cutting-bar constitute a single solidly constructed cylinder, and the cutting-bars in this solid construction are given the shape of a saw-tooth, rather than the precise shape of the adjustable cutting-bars in the Potts patent. This contention proceeds upon the theory that in holding the Potts patent valid and meritorious, the Supreme Court of the United States and the Circuit Court of Appeals for this circuit considered and decided only that the cylinder with the cutting-bars adjustable in grooves, was a valid device, and that the decisions are to be limited accordingly. It is quite clear, however, that the cylinder and cutting-bars, and the manner in which those bars were secured in position when the cylinder was in use, was not considered as a separate and isolated invention or construction, but was regarded as a part of a combination patent otherwise called an actually organized machine, and it would in my opinion be placing the decision on altogether too narrow grounds for the purpose of practical justice, to hold that the full benefit of a meritorious patent so declared by the highest authority, can be destroyed by so slight a change as this in the manner of constructing a single element or essential part of the combined patent. Such a holding, as it impresses me would be in practical effect to deny to this plaintiff the protection to which these two courts of review have declared this plaintiff and his invention entitled. Stated shortly the case would be to declare in most solemn form the plaintiff's right, and then deny that right in fact. I cannot bring myself to think that a question of broad justice, or the success of a meritorious invention, is to turn on a view which rests on grounds so limited. It cannot now, and will not at any time, be denied as a practical truth, that the defendant has really appropriated the plaintiff's invention, and that his machine is accomplishing the same result, substantially in the same way, and by a construction which for every purpose is substantially the equivalent of the plaintiff's invention. It is a combination patent that is to be here protected and that is involved, and not simply the cylinder considered apart from the other elements of the combined machine. This I think is apparent from a study of the Supreme Court, as well as the opinion of the Circuit Court of Appeals, as will appear from a part of the last paragraph of the opinion of the last named court, which I quote, giving in italics such parts as seem to bear more directly on the two points which I wish to bring out, and which are, first, that I am to deal with a combination patent, and that it was the combined patent that was declared valid, and, second, that the smooth roller now used by the plaintiff is no more than the equivalent for every purpose, of the vibratory plate in the older patent: Judge Taft giving the opinion of the court said:

"Objection is made by the defendant that the sixth claim of the complainant's patent is simply for a cylinder with the longitudinal grooves and scraping bars, adjustably secured in a groove, and that the other elements shown in the patent can not be read into it in order to make it *a combination patent.* We understand the Supreme Court in its decision to have treated this as a *combination claim*, or, at least, to have held that it was for the element in the clay-disintegrating *machine to be used in combination with the opposing and other elements necessary to secure disintegration of the clay by the methods specified in the patent* The Supreme Court intimates in its opinion that the *substitution for the vibrating* plate of a smooth *roller did not involve invention*, and therefore the second patent was not *valid as an improvement over the first.* It supports, however, *the validity of the first patent*, and the sixth claim thereof, as for the element in a disintegrating machine of the cylinder, constructed according to the claim, *in combination with a vibrating plate or the equivalent thereof*, which shall feed the mass of clay to the armed cylinder, and hold it to be clipped off or disintegrated, piece by piece, by the rapid revolution of the cylinder. It is impossible, therefore, to determine the validity of the claim in the light of the prior art, without *considering the other parts of the old machines with which the alleged anticipatory cylinder co-operates in them.* We have therefore felt justified, as the Supreme Court did, in looking at *the combination* in each of the old patents, to determine whether the revolving cylinder, with its peculiar functions, in the Potts patent had been anticipated. We hold, therefore, that the first Potts patent is valid and is infringed, but that the second Potts patent is invalid, because it shows no patentable improvement over the first. Other questions have been made by appellant, but, in view of our conclusion, it is not necessary for us to consider them. The decree of the circuit court is affirmed in so far as it dismisses the bill on the second Potts patent, and is reversed in so far as it dismisses the bill on the first Potts patent, with directions to enter a decree finding the validity of the first Potts patent, and ordering a reference for damages."

It is conceded that what is called the older Penfield construction is an infringement of the sixth claim in the plaintiff's patent, and that the plaintiff is entitled to the relief sought in respect of such machines as were made after that model and down to the time of what is called the new Penfield.

I conclude upon the whole case, that the new Penfield is in like manner an infringement of the plaintiff's patent, and of the third claim thereof.

In as much as it is a combined machine with which I am dealing, while the question has not been insisted on, my opinion is, that treating the smooth roller as the equivalent of the vibratory plate, the plaintiff might insist with much force that the new Penfield machine is simply the equivalent and an infringement of the device described in the sixth claim of the plaintiff's patent.

The defendant's eminent counsel, as I have intimated, puts a rigorously limited construction upon the decision of the Supreme Court and the Circuit Court of Appeals, viewing them just as if the cylinder and cutting-bars in the Potts patent alone had been considered apart from any question of its place and use in a combination patent, and this contention has been supported with much force indeed.

As stated, however, to allow the defendant to escape responsibility for infringement by what seems to be a merely mechanical change in the mode of construction, without any change in the mode of operation, or result, would be to deprive the ruling in the plaintiff's favor of that broad, just protection which should always be furnished by a solemn adjudication. It results from this view, that the plaintiff is entitled to the relief sought by an injunction against further infringement by the new Penfield, as well as the old, and the usual account in that respect A decree will go accordingly. CLARK, J.

THE UNITED STATES OF AMERICA, NORTHERN DISTRICT OF OHIO. } SS.

I, IRVIN BELFORD, Clerk of the Circuit Court of the United States within and for said district, do hereby certify the foregoing to be a true copy of the OPINION in the above entitled cause, in said court, and that the same is correctly copied from the original now on file in my office.

WITNESS, my official signature, and the seal of said Court, a Cleveland, in said district, this 13th day of July, A. D. 1900 and in the 125th year of the Independence of the United States of America.

[SEAL.]

IRVIN BELFORD, *Clerk.*
By JNO. VAN NOSTRAN, *Deputy Clerk.*

We are advised that all "Clay Disintegrators" now on the market are INFRINGEMENTS on our patents, and all persons are hereby WARNED against purchasing any such infringing machines. We shall certainly, as heretofore, vigorously assert our rights.

C. & A. POTTS & CO., Indianapolis, Ind.

Written for THE CLAY-WORKER.

DOWN IN JERSEY.

IN LAST MONTH'S letter I referred to the brick pavement on Highland Park Hill, New Brunswick, N. J.

Since then I have had occasion to haul one of my rigs both ways over this road. We experienced no difficulty in drawing 6,000 pounds up the grade with two horses, although the grade is quite steep. But we notice, as predicted in a letter to The Clay-Worker some twelve or fifteen months ago, when a controversy arose over the laying of this pavement, that the brick looked of a poor quality, and that they should likely prove a failure.

Now the pavement has been down possibly fifteen months, and the brick already show a heavy wear, and in one or two places a whole brick has worked out along the trolley track. As much as one-half inch was left between each course of brick to allow horses a better foothold, so it was said. This space was filled with small gravel and pitch. It shows a poor job, because, as every one who knows anything about brick pavements, will tell you that the brick will naturally chip more or less, and soon give foothold for animals.

We do not know what kind of foundation was put under this work, but the brick have settled in many places. As the bottom of the roadbed lies directly on the hard red shale found in this section, there was really no excuse for such poor work.

A comparison of this hill with two block of brick paving adjoining Rutgers College grounds, in New Brunswick, is a revelation in street paving. The latter work is also on a sloping hill, but he brick are so perfect and well laid that it does one's eyes good to look at them. This latter street is a thing of beauty, and should be a good advertisement for who ever done the work.

Perth Amboy is now having Fayette street, in that city, paved with brick. The brick look good and substantial, and as Thomas Reading, the contractor, lives in the city on the Raritan, it goes without saying that it will be a first-class job.

These openings or beginning are, to the writer's mind, the harbinger of a vast deal of work of this class in this section.

Mr. George Smith, one of Perth Amboy's young brick masons, who has been in the City of Mexico for some months past building kilns for a branch of the Standard Fireproofing Company, of Perth Amboy, N. J., returned to his native town recently on a business directly connected with his own happiness. Said business was to take unto himself one of Jersey's lilies as a bride, and then return to Mexico indefinitely. Mr. Robert Lyle, the general manager of the Standard Fireproofing Company, thinks George is the right kind of a man to build kilns, or George and his bride would not now be on their way to their new home.

The kilns spoken of in my last letter at the M. D. Valentine Bros. Company's plant are of the round down-draft pattern. The shell of steel surrounding this kiln is about three-eighths inch stuff bolted together, forming something like a great steel tank. This sets on top of the hub or furnaces, of which there are ten in each kiln. Around the top there are two heavy iron bands, such as are placed on all kilns, to reinforce the steel shell where the pressure is heavy from the weight of the crown. Inside of this shell a wall of fire brick is built of one and one-half brick in thickness, or, say thirteen or fourteen inches. The inner wall is made of bullheads built on edge of, say three by six inches, on the small ends. This, of course, fills the circumference of the kiln, which is perhaps twenty feet in diameter. The floor is solid, with a well hole in the center leading to the flues underneath the floors. This mode of building down-draft kilns seem to be in favor with this firm. The brick that are to be burned are set similar to the square kilns, with arches arranged somewhat as are the spokes of a wheel. These all lead to the center well, then to the chimney and through the flues underneath the kiln floor. As this is the third one of this pattern belonging to the Valentine plants, they must be a success, or this progressive firm would not build them. The steel shell requires less wall and keeps out the cold air that often passes through cracks in the ordinary wall.

We had the pleasure of meeting the proprietors of the Star Brick Works, at Cliffwood, near Matawan, N. J., since our last letter.

Here we find an immense plant, devoted to the manufacture of red brick, with a capacity of 200,000 per day.

We notice a new scheme for this section in use here at this plant. Instead of soaking all their clay over night, as is the usual method, the clay is carted to an elevator, which conveys it to a crusher, thence to a pug mill and brick machine, and directly to the drying yard in the shape of brick.

The clay banks at this yard are of an immense thickness, and will last for years. A new kiln is being erected here somewhat on the plan of the old Wingard kilns. The walls are four feet thick. If it proves a success a number of them are to be built. This plant is directly on the New Jersey Central Railroad, with tracks right under the kiln sheds, making it very convenient to load.

The Messrs. Averys are "pushers," and command an immense trade. These brick are of a deep red, and hold their color better than many of the common brick made in this section.

Some very heavy rains since the Fourth have caused considerable delay and damage to outside yards. Almost every evening a heavy rain has passed around through the Sayerville region.

The Haines-Campbell Company have commenced the erection of fifty-seven houses in Perth Amboy. Five two-story brick stores will be built on New Brunswick avenue. On this street there will also be five pairs of eight-room houses. On Ogden street there will be eleven pairs of seven-room houses, and on Chapman avenue there will be five pairs of six-room houses.

This firm, we understand, is from Philadelphia, and will, no doubt, do just what the writer has always advocated, viz., get out of the old rut of building, and put up something that will be substantial and metropolitan looking. The houses this firm are commencing are needed very badly, and many more besides.

Common brick, F. O. B. cars at Perth Amboy, are worth $5.80 per thousand for No. 1; No. 2, $5.30 per thousand.

Several hundred feet of twenty-four-inch pipe sewer is now being built on Albany street, New Brunswick. This pipe, I presume, comes from the Ohio river region, as it has all the earmarks as to color, etc. As the trench is being dug through the red shale deposits, it is rather slow work.

I never drive over this shale or drill a hole in it but what I think of the vast brick works that may some day use this abundant material. Everything is blood red, and sometimes your humble servant, after the drilling of a well, looks like a red Indian. It makes a good paint and good blood red brick, and if properly handled would make an A1 paver.

Why don't some of your readers who are looking for a location come over here and take a look at it? The writer will take pleasure in showing any of your readers around.

Perth Amboy, N. J., July 10, 1900. W. R. O.

IT BROKE HIS HEART.

BRONCO PETE.—When Roaring Bill heard Grizzly Pete wuz dead he shed a bucket uv tears.

STRANGER.—Ah! then he had a heart?

BRONCO PETE.—Did he! Why, he'd ridden over a hundred mile in a raging blizzard jez' ter kill th' cuss!—Puck.

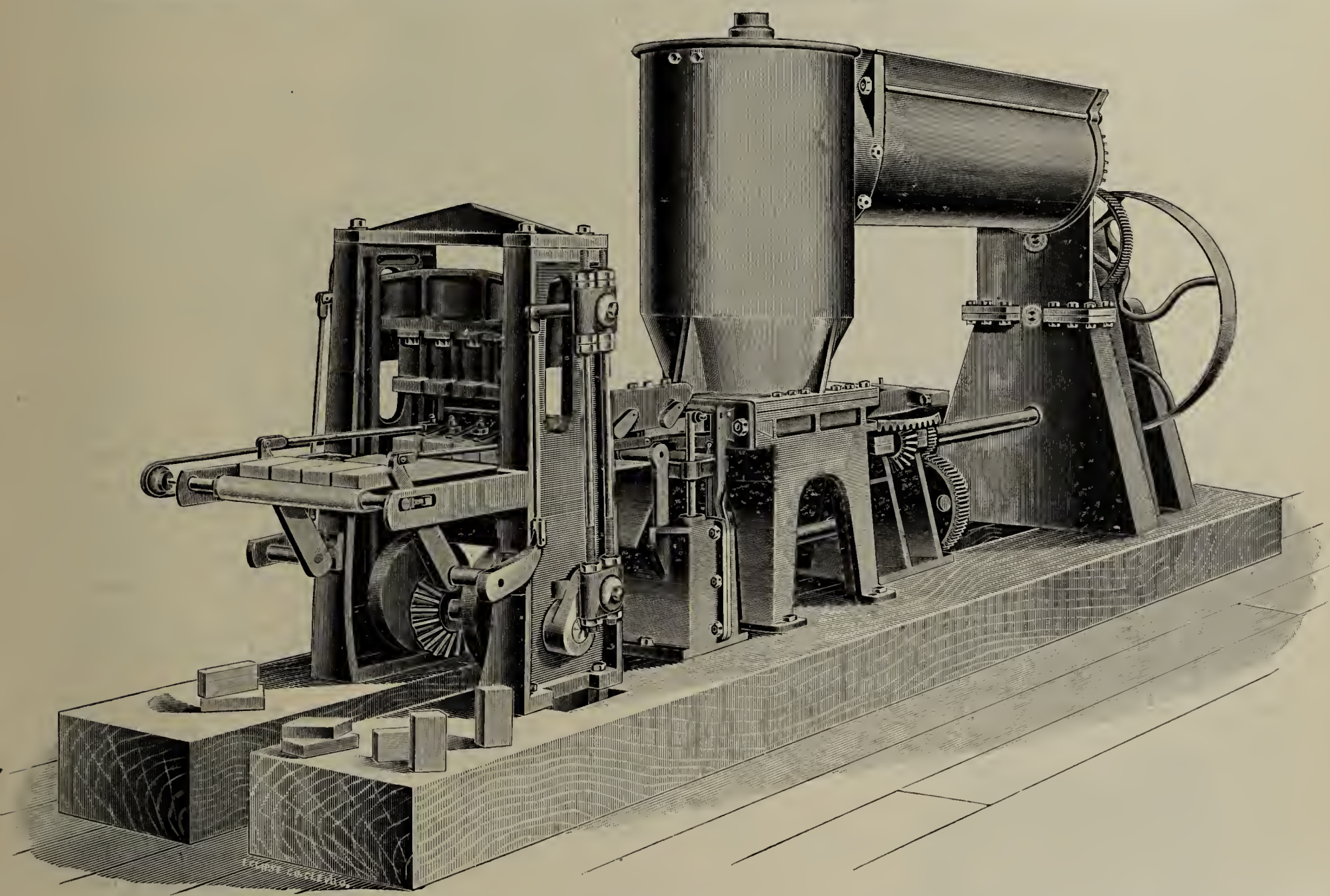
A Perfect Brick Machine.

STRONG, POWERFUL, SIMPLE and POSITIVE.

Absolutely Unbreakable. **Less Working Parts than any other Machine.**
Without Repressing Attachment.

The DICTATOR BRICK MACHINE will take the Clay or Shale as it comes from the bank or Dry Pan and automatically produce perfect repressed brick.

NO LAMINATION.

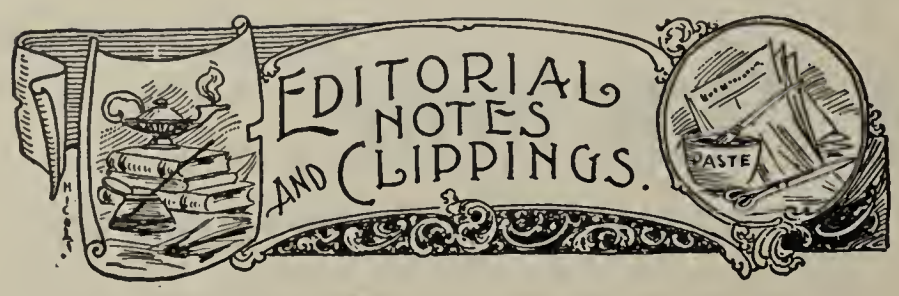


DICTATOR BRICK MACHINE. Capacity 40,000 Perfect Repressed Brick per day.

The only machine in the World, that will Automatically produce perfect Repressed Brick.

The Battenfeld Mfg. Co.,

Write for Catalogue. *922 Garfield Bldg, CLEVELAND, OHIO.*



Coyle, Okla., wants a brickyard.

M. P. Keefe will start a brick yard at Cheyenne, Wis.

There is a splendid opening at Hinsdale, Mont., for a brickyard.

A new brickyard is to be established at Gary, S. D., by Mr. Hale.

Reed & Landis will establish a brickmaking plant at Pennsburg, Pa.

Edwin Benner, of Hatfield, Pa., has purchased a brickyard near Souderton, Pa.

J. D. Mason is rebuilding his brickyard at Lubec, Me., which was destroyed by fire last year.

The Mattoon, (Ill.) Tile Co. is being equipped with machinery for the manufacture of paving brick.

R. B. Templeman is at the head of a company that has been formed at Navasota, Texas, for the manufacture of brick.

The Mentzer Clayworking Co. has been incorporated at Kenton, O., by M. D. L. Mentzer and others. Capital stock, $30,000.

The York and Spring Grove Brick Co., located at Spring Grove, Pa., sustained a slight loss by fire in their kiln sheds recently.

Mr. Fred LeClaire, the well-known brick manufacturer of Attica, Ind., was recently married to Miss Etta Briggs, of West Lebanon.

The Lehigh (Ia.) Clay Works has been incorporated by W. L. Bradley, F. C. Eslick and C. W. Hughes, with a capital stock of $30,000.

The brick plant of L. M. Hidden, at Vancouver, Wash., which has been idle for some months, was started up recently with a full crew.

George W. Wilson, W. A. Greenlee and R. Wills, three well known colored men of Emma, N. C., have started a brickyard at that place.

The Duke Brick Works, Anniston, Ala., which was wrecked by a boiler explosion last month, as noted in the June Clay-Worker, is being rebuilt.

A. W. Winzenburg will soon begin work on a new brick plant at Sedalia, Mo. Mr. Winzenburg says the plant will have a capacity of 20,000.

Keir Bros., proprietors of the Salina (Pa.) Fire Brick Works, are building new kilns and increasing their capacity to keep pace with their growing trade.

Charles Boggs, an employe at the yard of the Baltimore (Md.) Brick Co., had his left hand and arm badly lacerated by being caught in a brick machine.

Brick manufacturers of Seattle, Wash., have found a new market for their brick and are now shipping brick to Hawaii. The brick sell for $8.00 at the kiln.

The Missouri Fire Brick Co., St. Louis, Mo., has just completed rebuilding its plant, which was destroyed by fire. The plant has been materially enlarged.

Miller & Sons, New Whatcom, Wash., report a very busy season, both demand and prices satisfactory. They are getting $8.00 a thousand for all they can make.

Witter & Breisinger, of Bucyrus, O., who have been exclusively brick manufacturers for years past, have added a tile equipment, having purchased from their fellow townsmen, the American Clay-Working Machinery Co., of Bucyrus. This firm of clayworkers has been in the business for nearly a generation.

Under date of June 23, Gaston & Poyner, Athens, Tex., write: "The Clay-Worker is improving all the time. We found the last issue the most interesting we have ever read."

Isaac Van Leuven has sold his brick and tile yard at Goshen, N. Y., to Dr. W. F. Decker, of Paterson. Mr. Van Leuven will be retained as superintendent of the plant.

A. J. Nash is making a number of improvements in his brick plant at Clinton, Ill. When the new machinery is in place the plant will have a capacity of 40,000 brick per day.

L. M. Patterson & Co. are running both a night and a day force at their brick plant at Lock Haven, Pa., in order to keep even with the demand. They are shipping eight to ten cars of brick daily.

The kiln sheds at the brickyard of Wm. Osman, Jr., Detroit, Mich., were destroyed by fire recently. Mr. Osman states that though he has been in the brick business thirty years this is his first fire.

J. B. Patterson writes that Oswald Kutsche, of Chicago, has purchased a large tract of land at Corry, Pa., on which there is a fine deposit of shale and is organizing a company to manufacture brick.

The large brick works at Alpha, N. J., operated by the Alpha cement works, is now completed and running full handed. John Hoffman, an experienced brickmaker, of Riegelsville, Pa., is superintendent.

John Clifton, Peru, Ind., whose brick plant at Converse was recently destroyed by fire, has purchased the brick plant at Matthews, Ind., for $20,000. He will operate this plant instead of rebuilding at Converse.

F. E. Swift, Washington, Ia., advises us that he has sold the Consolidated Brick Co., at Decatur, Ill., the right to use the Swift slack coal coking table furnace kilns. Mr. Swift says they are running their plant at Ottumwa, Ia., to full capacity.

The Champion Brick Co., of Towson, Md., has been incorporated with $60,000. The directors for the first year are Messrs. Jacob Klein, George R. Willis, Francis T. Horner, of this city, and Messrs. Robt. B. and Chas. C. Horner, of Baltimore county.

The Brockaway Brick Company, at Fishkill-on-Hudson, N. Y., is to have the largest and finest dock on the Hudson river. It is to be started at once. The dock will be 900 feet long, and will require 140,000 feet of yellow pine and 25,000 feet of chestnut lumber.

In a recent letter, referring to trade in England, our able contributor, Alfred Crossley, Commondale, Eng., says: "Business is very good in our line; the building trade keeps up to a high pitch. The prospects are good for a continuance of this satisfactory trade condition."

Thomas Trainor writes that he is now firmly installed in his new position as superintendent of the Sangamo Brick Co., Springfield, Ill. He is making a number of changes at the plant and says in a short time he will have as fine a yard as can be found in that section.

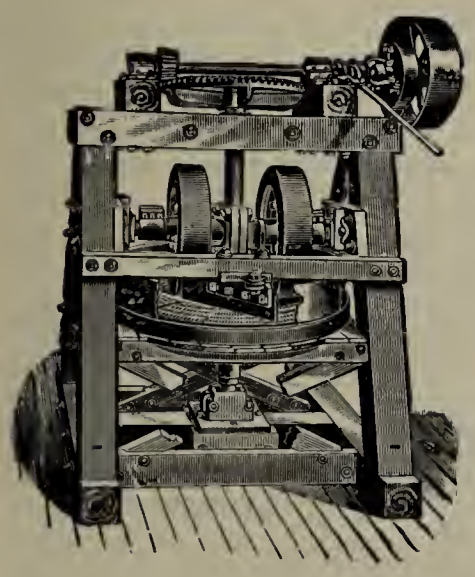
Capt. W. B. Keller, who had been identified with the well known firm of A. J. Haws & Son, fire brick manufacturers of Johnstown, Pa., for the last twenty years, has severed his connection with said firm to accept the position of general sales agent for the Resse-Hammond Fire Brick Co., with offices at Nos. 912 and 914 Park building, Pittsburg. This firm now has large works in full operation at Bolivar and at Fairmont, W. Va., and in addition will in a few days have their large new works, now building at Curwensville, Pa., ready to start.

The Galesburg (Ill.) Paving Brick Co., who suffered a severe loss by fire recently have rebuilt their machine building and dryer. In rebuilding brick and iron have been used instead of wood, thus making the buildings as nearly fireproof

(CONTINUED ON PAGE 54.)

OUR SPECIALTY IS

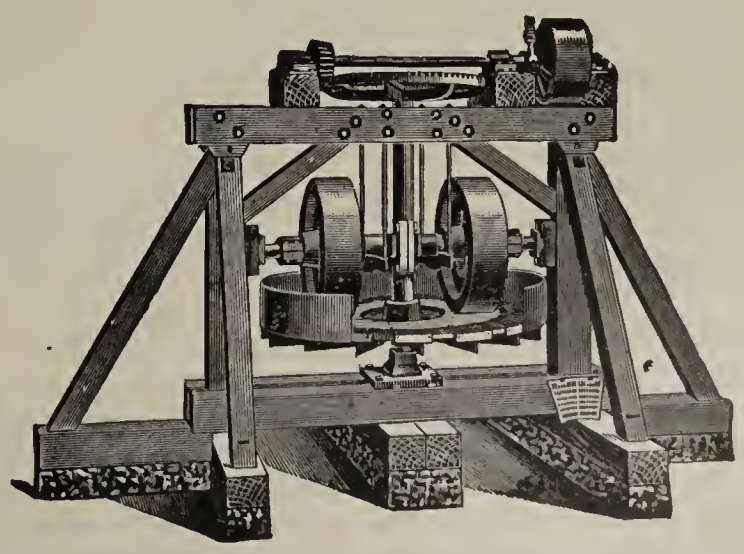
DRY PANS.



IRON FRAMES,

WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill., U. S. A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

as possible. The portions of the machinery that is not entirely new has been thoroughly overhauled and much of it is new in parts. The plant was started up again July 9, within six weeks from the date of the fire.

The Tinsley Brick Co. has just been incorporated to manufacture brick at Petersburg, Va. C. D. Tinsley will be manager.

The brickyard of Henry C. Koenig, at Osage and Marine avenue, St. Louis, Mo., was damaged to the extent of $2,000 by fire recently.

The brickmaking business of James H. Kirk has been succeeded by a corporation known as the Kirk Brick Co. The officers of the new concern are: S. Bamberger, president; Jas. H. Kirk, vice president, and J. Oberndorfer, secretary and treasurer. They have a capital stock of $70,000.

The plant of the Indiana Clay Co., at Shoals, Ind., was totally destroyed by fire on the 28th of June, entailing a loss of $25,000. The fire started in the ware room where was stored a large amount of very fine ware. A high grade of pottery was manufactured at the plant which will probably be rebuilt.

In renewing their subscription to Clay-Worker the Port Gibson (Miss.) Brick & Mfg. Co., writes that they have more orders than they can fill, and their neighbors are in the same condition, but, unfortunately, there is no harmony among the manufacturers, every one is trying to undersell his neighbor and very low prices prevail.

A party of capitalists have purchased the plant of the S. B. Donley Brick Works at Washington, Pa. The new owners will enlarge the plant, increasing the capacity. They have applied for a charter and will be incorporated as the Washington Brick Co., with a capital stock of $25,000. Wm. Donley will be retained as superintendent.

L. P. Battefeldt, of Bucyrus, O., proprietor of the Bucyrus Brick and Terra Cotta Company, has put in a new No. 2 Giant and has secured a number of large contracts for brick. Mr. Battefeldt and his father before him have been exclusively tile manufacturers, but decided to go into the brick business, as he has ample drying and burning capacity.

Wm. Wirt Clark & Sons, 115 Gay street, S., Baltimore, Md., will be pleased to have manufacturers of buff face brick quote them prices and submit sample, brick made by the stiff clay process preferred. They are in the market for a million of these brick, which, they say, must be burned nearly to vitrification so as to be nonabsorbent and should have an "eggshell" gloss.

The new Lookout Sewer Pipe Works, at Blowing Springs, Ga., a short distance from Chattanooga, Tenn., which for more than a year has been in course of construction on the site of the old plant, which was destroyed by fire, began operations July 3—a sort of patriotic celebration. They start with a force of 100 men, but this number will be increased when the plant gets to running to the full capacity.

A. Connor, superintendent of the Summitville Tile Works, Montezuma, Ind., writes that they are going to build three new 30-foot round down-draft kilns and enlarge their buildings. They are now making the largest drain tile made in the United States, being 30 inches in diameter and weighing 480 pounds, with a carrying capacity of 4,187 gallons per minute, with a 1-inch fall to the hundred feet.

Patrick McCann, one of the leaders of the brickyard strike at Fishkill-on-Hudson, N. Y., was accidentally killed by a railroad train, July 9. The sheriff had a warrant for Mr. McCann's arrest and was about to serve it. The latter was very angry and shouting and gesticulating, backed away from the sheriff, stepped directly in front of a New York Central express train and was ground to pieces. The sheriff shouted a warning at the unfortunate man, but it was unheeded. Seven of the strike leaders have been arrested and the brickmakers have once more resumed work.

Benjamin J. Leiser, a pioneer brick manufacturer, Allentown, Pa., died at his home in that city recently. He began manufacturing brick in 1864, being in the business either in Pennsylvania or Ohio almost continuously since that time. At the time of his death he was connected with the West End Brick Co., but his ill health had prevented active work the past few years. He was sixty years old and leaves a wife and seven children.

In a recent communication, referring to the $3,000,000 fire at Bloomington, Ill., Elder & Dunlap say: "While our plant was in the path of the wind and subjected to showers of burning embers, we did not have any trouble. Now that our brick plant is left we can make brick to rebuild the burned district. We are selling a great many clay screens, in fact, the trade for the summer months so far is way beyond our expectations and the prospects are good for a splendid fall trade."

Mr. Milton F. Williams, president of the Williams Patent Crusher and Pulverizer Co., of St. Louis, Mo., sailed for Europe Saturday, July 7, and will spend several weeks on the continent in the interest of his company. While Mr. Williams goes abroad on business, we anticipate that he will incidentally pick up a good many items of interest pertaining to claywork, though he will find the clayworkers of Europe much less communicative than are the brethren here at home.

The Indiana Machinery Co., of Indianapolis, has been appointed sales agent for the Chandler & Taylor engines, and will also handle dry pans, etc., made by the Frost Engine Co., Galesburg, Ill. Mr. Will Simpson, well known to the brick and tile men of the country, is now connected with the former company, and they propose to give particular attention to clayworking plants. They have fine display rooms at the corner of Washington street and Capitol avenue, where visiting clayworkers will be welcomed cordially.

Lafayete, La., needs a brick and tile plant. Within the past month a million brick have been shipped to that thriving city from distant plants, the freight rates alone representing an expense to the consumer of thousands of dollars. There is an abundance of good clay in the immediate vicinity, labor is cheap and wood is plentiful at $2.10 per cord. Parties desiring to investigate the situation with a view of establishing a plant there are requested to write A. D. Martin, Lafayette, La., who will cheerfully give further particulars.

The Pacific Art Manufacturing Co. is the name of a new concern that has been organized at Los Angeles, Cal., to manufacture ornamental tiles for floors, walls and mantels. Prof. Joseph Kirkham, who was at the head of the Kirkham Art Tile Works, at Barberton, O., which burned the year of the World's Fair, is the prime factor in this movement. Ground will be broken at Tropico, a suburb of Los Angeles, and the work of building pushed to completion as rapidly as possible. Connected with Prof. Kirkham are a number of wealthy capitalists, both from the East and West.

The Imperial Steel Works, owned and operated by the Japanese government, has just planned an order for the complete equipment of the plant with Cross Oil filters, with the Burt Mfg. Co., of Akron, Ohio.

As the Burt Co. were in competition with the best manufacturers of filters in Europe and other American makes, they regard it as a distinct triumph for the Cross filter.

The Imperial Steel Works is probably the most important plant of the kind in the flowery kingdom.

Mention THE CLAY-WORKER.

When writing to Advertisers,

Mention THE CLAY-WORKER.

MORRISON'S LATEST IMPROVED KILN

For Burning Building Brick.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object. Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,
P. O. Box 335, Rome, Ga., U. S. A.

LEVIATHAN "It's a Brick,"

....EITHER FOR ...

Transmission or Conveying.

And why it is in such general use among CLAYWORKERS, is that it may be run with less tension than other belts, does not slip; may be subjected to the most excessive weather conditions without injury, and as a result,

Outlasts From Two to Five Rubber Belts.

MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.
55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.
Write for Samples and Price List.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

FOR SALE—Prosperous brickyard, on account of death of both owners. More good orders for brick than can be supplied. Address BECKMANN, care Clay-Worker.
7 1 c m

ENAMELER superintendent wants position; practical proof of ability given to firms intending business.
CLARENDON, care Clay-Worker.
6 1 c

WANTED—A second-hand single mold dry press brick machine. Whittaker preferred. Must be in good condition and cheap. Address
7 1 d BRICK CO., care Clay-Worker.

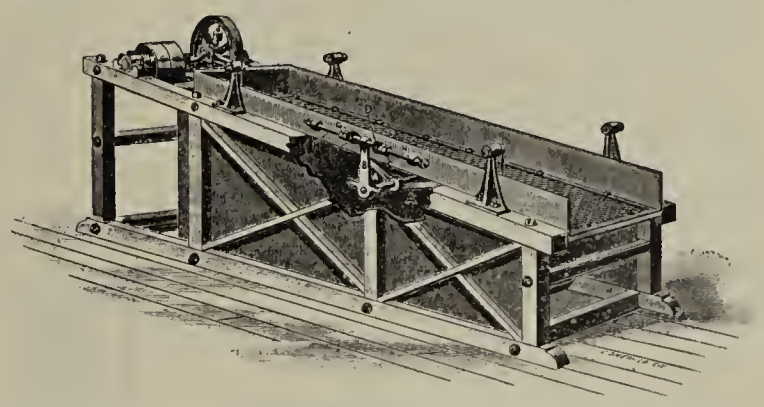
FOR SALE—One E. M. Freese, Steam Mammoth Brick Machine, with cutting table complete. Capacity, 60,000.
CHARLES F. SHUSTER,
5 4 c Norwood, Pa.

WANTED—A Situation as manager or superintendent by a practical brick maker. Dry Press or stiff mud Fire brick or fire proofing, up or down draft kilns. Can lay out and build y. rds, kilns, place machinery, etc.
Address, WILLIAM,
7-1 c Care CLAY-W' RKER.

FOR SALE—A standard sewer pipe press in good condition, with dies from 3 to 24 inches, trucks, drums, etc., complete. Will trade above for a two or three mold dry press brick machine in good condition. Boyd or Berg preferred. Address
7 1 d POYTON, care Clay-Worker.

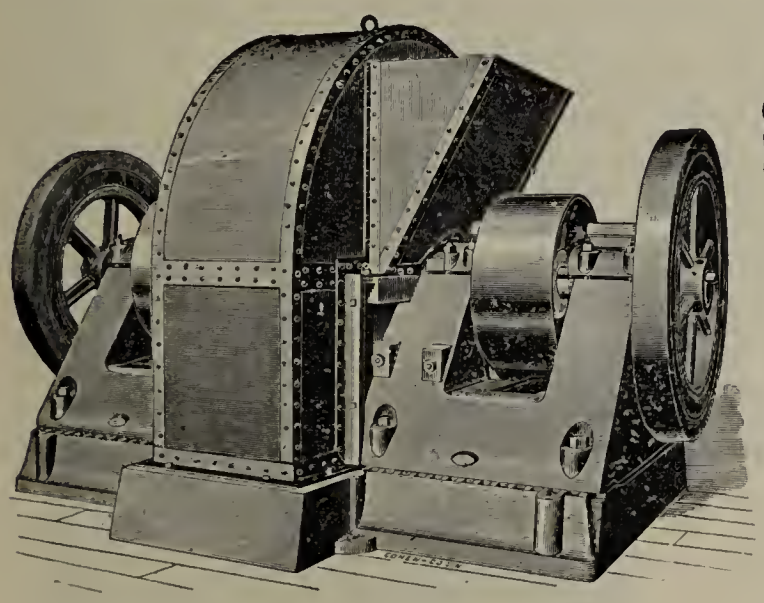
WANTED — Situation as superintendent of building brick plant. Have had several years' experience with Chamber's machine, steam shovel, etc. Can give best of reference. A permanent position more important than salary. Understand the management of men. For other particulars address
7 1 d r MR. PUSH, care Clay-Worker.

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.



A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials.

Stedman Foundry & Machine Works,
AURORA, INDIANA.

A WELL EDUCATED German engineer and chemist will undertake the construction of any size cement works. Many years experience and thorough knowledge of the business in all its details. Address
EMIL MULLER,
6 1 5 p 18 Paula St., Havana, Cuba.

FOR SALE—Half interest in one of the best equipped brick plants in the Ohio valley; 20,000 per day, 8 tunnel dryer, 2 up-draft, 2 round down-draft kilns, natural gas fuel, all in good running order, plant has made 1,000,000 since April 15, reason for selling other business needs attention. For price, address
6 2 d TREBE, care Clay-Worker.

WANTED—A man with practical experience in the manufacture of all sorts of fire brick, sewer pipe connections, traps, access pieces, etc.; also a thorough knowledge of the Dunnachie patent Regenerative Gas Kilns, desires a permanent situation; can give good references. Address
GLENBOIG,
6 tf r Care Clay-Worker.

WANTED — A situation as superintendent or foreman of paving brick department in a clay manufactory. Have had years of experience, and can successfully manufacture blue vitrified paving brick, such as have proven so satisfactory in England. They are generally considered the most durable of all paving brick, and can be made from shale or clay used in this country in the manufacture of sewer pipe, etc. These brick can be made at small cost—little, if any, more than common builders. I will guarantee this and to produce paving brick the equal of any made in this country. I know whereof I speak, and do not propose to indulge in any experimental work. Can give the best of references. Address "BLUE PAVER," care Clay-Worker. 3-1-r

WANTED TO PURCHASE.

Narrow gage saddle tank locomotive, Porter or Baldwin make preferred, also one steam shovel. Please furnish full description. Address LOCOMOTIVE,
5 3 6 1603 Monadnock Block, Chicago.

PERSONAL.

We seek the address of M. J. Carlton, formerly employed as brick works superintendent by The Weber Brick Co., of New Jersey, and by Mr. John Miller, of Washington, D. C.
CHAMBERS BROS. CO.,
52d St., below Lancaster ave.,
5 1 f Philadelphia, Pa.

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

A COMPLETE BRICK PLANT FOR SALE AT A BARGAIN.

EVERYTHING NEW.

Only brick plant located in Warren, O., a town of ten thousand inhabitants. Having bought same at assignee's sale, must be disposed of at once.
THE HORTON MFG. COMPANY,
2 tf l Painesville, O.

BARGAINS—FOR SALE:

Several second-hand brick machines, steam power.
One second-hand horse-power brick machine.
One second-hand mould sander, almost new.
One second-hand 25-horse-power engine, in perfect order.
One second-hand 25-horse-power boiler.
One wire cut brick machine complete with die.
One dry pan, new.
HENRY MARTIN BRICK MACHINE MFG. CO., Lancaster, Pa. 7 tf L

SEASHORE EXCURSION.

—Choice of Ten Popular Resorts for $15.00 Round Trip from Indianapolis.—

Thursday, August 9th, is the date on which excursion tickets will be sold via Pennsylvania lines to Atlantic City, Cape May, Avalon, Anglesea, Holly Beach, Ocean City, Sea Isle City, Wildwood, New Jersey, Ocean City, Maryland, and Rehoboth, Delaware. Return limit will cover the customary ten days vacation. This will be a grand opportunity for a delightful vacation outing. For details apply to W. W. Richardson, D. P. Agent, Indianapolis.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

Drying Economy.

Our Dryer is superior to others by reason of improved methods, low cost of construction and economy of operation. If you're interested in dryers write for particulars. Ours will prove a good investment.

We also manufacture Conveyors, Exhausters, Heaters, Fans, Engines and Mechanical Draft Apparatus.

THE NEW YORK BLOWER CO.,
Bucyrus, Ohio.

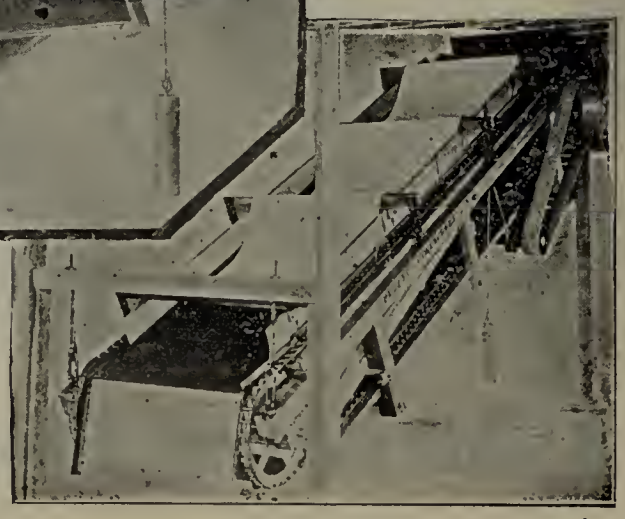
NEW YORK OFFICE:
39-41 Cortlandt St., New York, N. Y.
BOSTON OFFICE:
185 Summer St., Boston, Mass.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush

HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

For Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan Bark, Cinders, Ores, Sawdust, Lime, Cement, etc. Also continuous Pan Conveyors.

Iowa Pipe and Tile Co , Des Moines, Iowa.
Borden & Selleck Co , Chicago:
Gentlemen—We have used the Harrison Conveyor for the past two years. It takes about ninety tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours truly, IOWA PIPE & TILE CO.

BORDEN & SELLECK CO., Mfrs. and Sole Agents, **48 & 50 Lake St., Chicago.**

Send for Illustrated Catalogue.

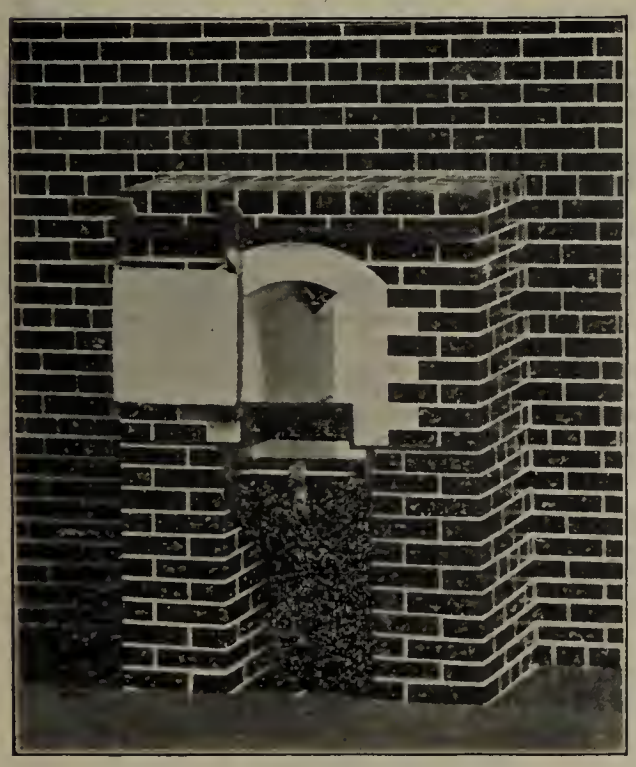
The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS. Agent and Patentee, **161 Grand Street. Rahway, N. J.**

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.



For **uniformity** in **burning, hardness of ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump,** and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address
OLD BRICKMAKER,
1 tf d Care Clay-Worker.

THREE EXCURSIONS TO NORTHERN MICHIGAN

will be run via Pennsylvania Lines. The dates are August 30, September 6 and 8. For particulars about rates, etc., apply to W. W. Richardson, D. P. Agent, Indianapolis.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.
PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.
SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH.
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 4 tf d

FOR SALE.

One Iron Standard steam power machine, with pug mill attached.
One Fletcher & Thomas pug mill.
One Anderson Brick Machine, with 12-foot pug mill.
Two reliable hand brick machines.
One new Brewer Crusher.
One second-hand Brewer Crusher.
One Carnell repress.
One Penfield No. 7 brick and tile machine.
One Penfield soft mud machine.
One Penfield double plunger brick machine.
One Freese board delivery cut-off table.
One Fate-Gunsaulus rotary table.
One forty-horse power boiler and engine.
One Monarch Machine, used two summer seasons; in excellent repair.
THE HORTON MFG. CO.,
4 tf d Painesville, O.

NORTHERN MICHIGAN EXCURSIONS

To Traverse City, Petoskey and Mackinac Island, Via Pennsylvania Lines.

The dates for the low rate excursion to Northern Michigan via Pennsylvania Lines are August 30, September 6 and 8. On those dates excursion tickets to Traverse City, Petoskey and Mackinac Island may be obtained. The return limit will include thirty days from date on which tickets are sold.

This will be an excellent opportunity for an outing in Northern Michigan. Fishing ing will be at its best; the hunting season will be open, and the pure air will be invigorating and healthful, while the lakes and woodland will be especially attractive.

Round trip rate from Indianapolis will be $10 to Traverse City or Petoskey and $11 to Mackinac Island. Corresponding low rates will be in effect from other ticket stations on the Pennsylvania Lines. For details apply to W. W. Richardson, District Passenger Agent, Indianapolis.

VanDuzen's STEAM JET Pumps.

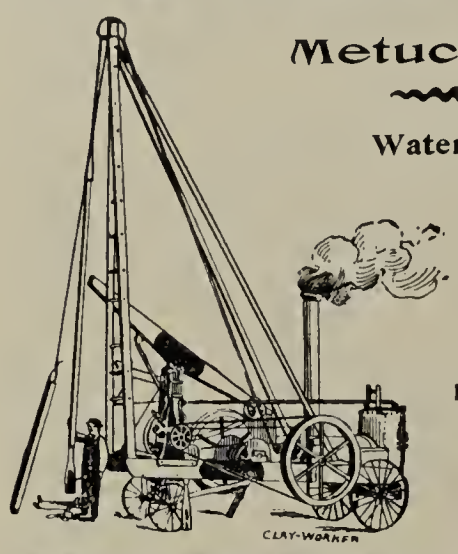
Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed.

Write for Catalogue No. 68.
The E. W. VANDUZEN CO., Cincinnati, Ohio.

$6.95 to $99.75

At from $6.95 for a 100-pound house safe to $99.75 for a very large double outside and double inside door bank or public office safe, we sell the **HIGHEST GRADE FIRE-PROOF COMBINATION LOCK SAFES MADE,** letter your own or firm name on, and ship to anyone any place in the United States, payable after received. For $23.95 we sell a good size safe for any store, office, factory, shop or hotel. **We will save you more than one-half in price.** For full particulars, special safe catalogue, special pay-after-received offer, etc., cut this notice out and mail to us. **SEARS, ROEBUCK & CO., CHICAGO.**

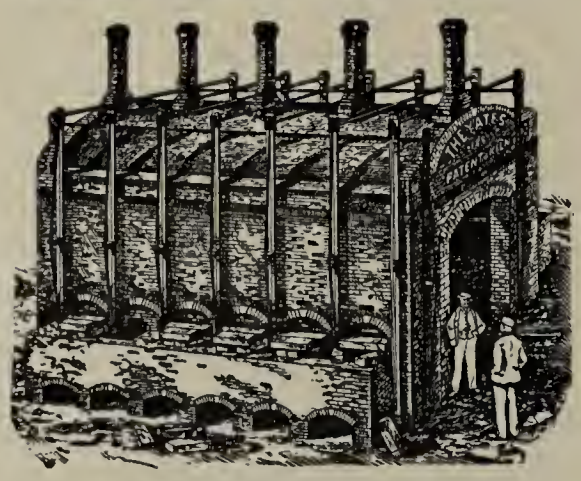
W. R. Osborne,



Metuchen, N. J.

Water Wells, Tanks, Pumps, Etc.

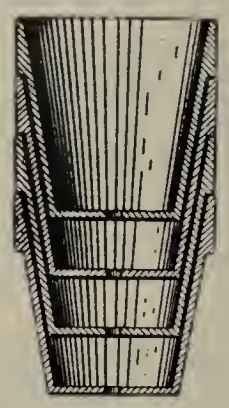
LOW PRICES



Economy of Fuel and Large Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.
Hot air dryer. Continuous and Muffle Kiln

ALFRED YATES,
JOHNSONBURG, PENN



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

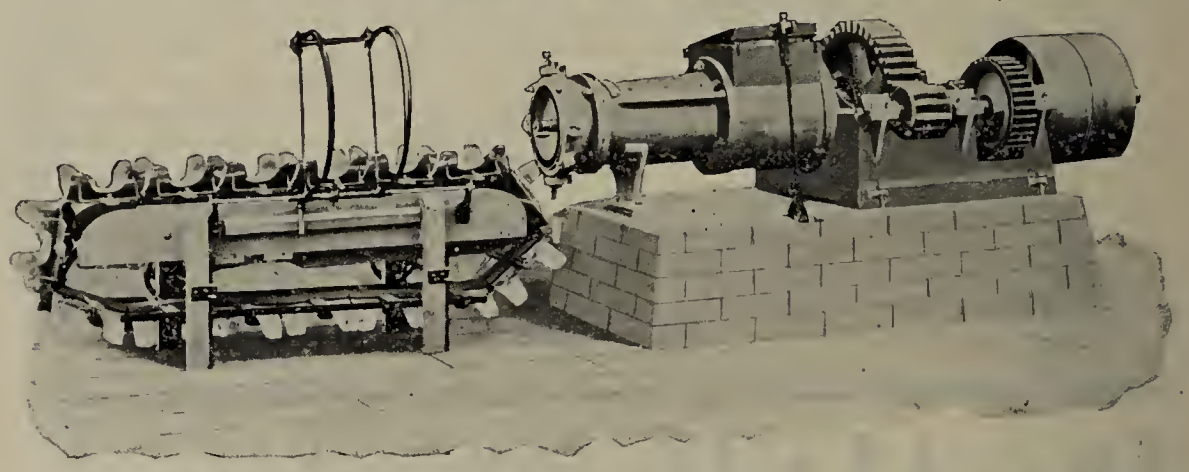
No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
78 South Pennsylvania St., INDIANAPOLIS, IND.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,
Detroit, Mich., U. S. A.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

Evens & Howard Fire Brick and Sewer Pipe Company,

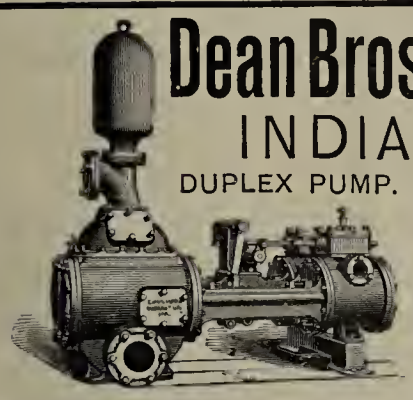
ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Dean Bros.' Steam Pump Works

INDIANAPOLIS, IND.

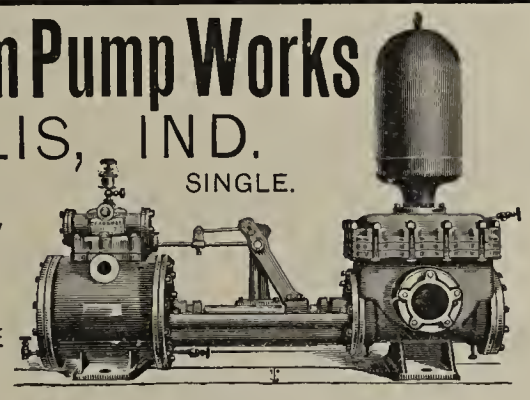


DUPLEX PUMP.

PUMPING MACHINERY FOR ALL PURPOSES.

SEND FOR CATALOGUE AND PRICES.

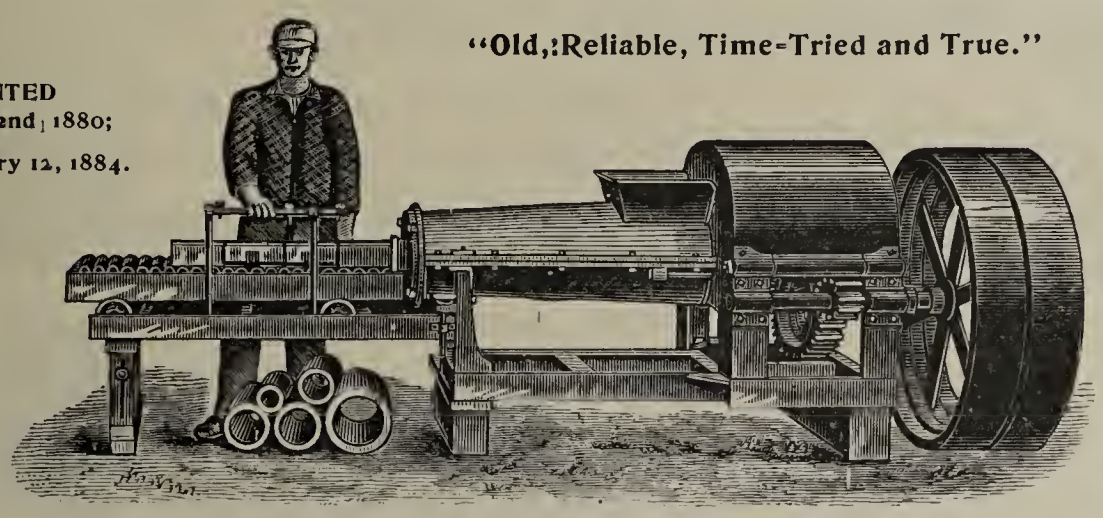
SINGLE.



KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd, 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of WELLS & HALL,
Successors to WESTBROOK & WELLS,
Ogdensburg, N. Y.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.

NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. **Carbonate of Barytes**

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent. CINCINNATI, OHIO

H. W. FULLER, Gen'l Pass, Agent, WASHINGTON, D. C.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 3:05 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 12:20 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY.

Lv Indianapolis, 4:10 am, 8:05 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

Have you thought About your Cuts for your NEXT CATALOGUE?

We Make 'em Right

INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.

INDIANAPOLIS, IND.

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY,
Industrial Agt., St. Louis, Mo.

or

E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between CINCINNATI and INDIANAPOLIS, DECATUR, SPRINGFIELD, JACKSONVILLE, HANNIBAL and QUINCY.

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	4.05 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

NIAGARA FALLS EXCURSION.

WAIT FOR THE OLD RELIABLE

Lake Erie & Western Railroad,

PERSONALLY CONDUCTED

NIAGARA FALLS EXCURSION

IN CONNECTION WITH THE

Lake Shore & Michigan Southern Ry.

LEAVE INDIANAPOLIS 11:15 AM.,

Thursday, August 2, 1900,

RATE: $7.00 FOR ROUND TRIP.

ALSO

SANDUSKY and PUT-IN-BAY

WITH SIDE TRIPS TO

LEWISTON, TORONTO, THOUSAND ISLANDS, ETC.

For tickets, rate, time and pamphlet containing general information, call on any ticket agent of the above route, or address

C. F. DALY,
General Passenger Agent, Indianapolis, Ind.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt.
Marietta, Pa.

Chenoa, Ill.

IF YOU NEED.. Wooden Pallets

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

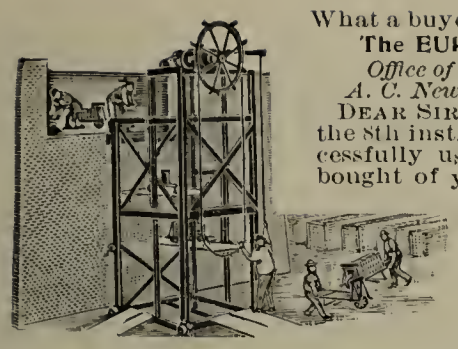
W. B. MERSHON & CO.,
Saginaw. East Side Mich.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.



What a buyer in 1890 says to-day of
The EUREKA BRICK ELEVATOR

Office of the Buffalo Brick Association,
A. C. Newton, Patentee, Cresent, N. Y.

DEAR SIR—Replying to your inquiry of the 8th inst., this Association is still successfully using the two brick elevators bought of you in 1890. They are useful and practical machines, and the long and hard use of them by us shows that they are constructed in a very serviceable manner.

Very truly yours,
The Buffalo Brick Asso.
O. W. WAGER, Mgr

Write for particulars.

A. C. NEWTON, Manufacturer, Crescent, N. Y.

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

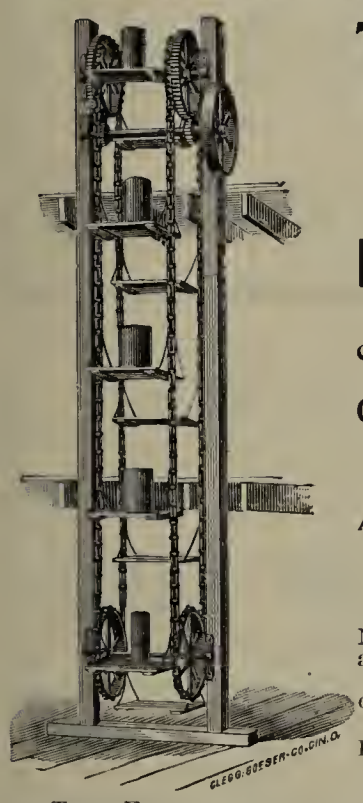
CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., Western Ave. 17th-18th St. CHICAGO, ILL.

Our new Catalogue No. 25 (380 pages), will be sent upon application.



TILE ELEVATOR.

The Jeffrey Manufacturing Co.,

Columbus, Ohio, U. S. A.

ELEVATING--CONVEYING MACHINERY.

CONVEYORS FOR HANDLING
Green Tile,
Brick,
Sewer Pipe,
And Packages of all Description.

Chains, Standard and Special,
Sprocket Wheels,
Elevator Buckets. Elevator Boots,
Shafting, Cable Conveyors,
Hangers, Apron Conveyors,
Pulleys, Spiral Conveyors.

We make Elevators, Conveyors, Carriers, Power Transmission Machinery and all sorts of Labor Saving, Profit-producing appliances for use in and around Tile Mills, Brickyards, etc., etc.

We also submit designs and build machinery to meet special requirements in the lines named above.

Write to us for estimates, before placing your order. We can probably save you some money.

SEND FOR CATALOGUE.

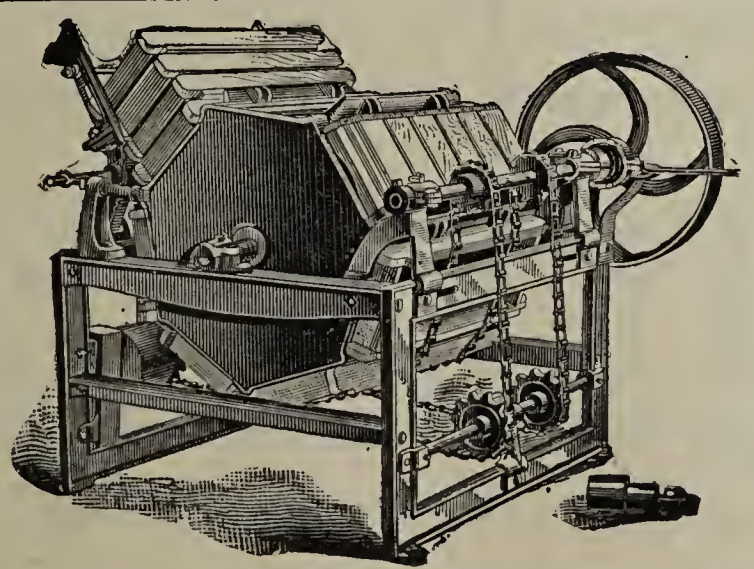
NEW YORK OFFICE, 41 Dey Street.

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been successful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

The VANDALIA LINE

The Short Line for St Louis and the West.

Leave Indianapolis.		Arrive at Terre Haute.	Arrive St. Louis
No. 15	7:25 am,	9:55 am	5:00 pm
No. 5	6:45 am	8:35 am	12:56 pm
No. 21	12:15 pm	2:05 pm	6:40 pm
No. 7	3:30 pm	5:10 pm	9:40 pm
No. 11	7:05 pm	9:00 pm	1:44 am
No. 19	11:20 pm	1:50 am	7:12 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No. 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.

All trains carry first-class coaches.

12:15 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent,
E. A. FORD, G. P. A. Indianapolis, Ind.

A Perfect Pen

AT A POPULAR PRICE, AND THE BEST PEN AT ANY PRICE

YOUR CHOICE OF THESE

$3.00

Laughlin Fountain Pens

FOR ONLY

$1.00

Try it a Week! If not suited, we buy it back and offer you $1.10 for it.

A Profitable Proposition any way you figure it. Don't miss this opportunity of a life time to secure the best pen made. Hard rubber reservoir holder in four simple parts. **Finest quality diamond point 14k gold pen, and the only positively perfect ink feeding device known to the science of fountain pen making.**

"A gift of never ending usefulness and a constant pleasant reminder of the giver."

☞ Any desired flexibility in fine, medium or stub.

One Pen Only to One Address on this SPECIAL SEED-TIME SALE.

By mail, postpaid, upon receipt of $1. If you desire pen sent by registered mail send 10 cents additional.

Ask your dealer to show you *this* pen. If he has not or won't get it for you, send his name and you order to us, and receive *free of charge* one of our Safety Pocket Pen Holders

Address

LAUGHLIN MFG. CO.,
Laughlin Block,
DETROIT, MICH.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades.
Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING. SYRACUSE, N. Y.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

THE COALDALE BRICK AND TILE CO.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

COALDALE VITRIFIED PAVERS,
Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.
The extent and character of our clays and facilities for manufacture insure uniform quality of product.
Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT, COALDALE, ALA.
TELEGRAPH OFFICE, WARRIOR, ALA.
BRANCH OFFICES BIRMINGHAM, ALA., MONTGOMERY, ALA., NEW ORLEANS, LA.

The Eastern Paving Brick Co.,

MANUFACTURERS OF THE HIGHEST GRADE

VITRIFIED PAVING BRICK and BLOCK,

For Streets and Sidewalks. Positive guarantee as to wearing qualities. Largest capacity in the East.
Correspondence solicited.

Office and Works, CATSKILL, N. Y.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date.
By H. A. Wheeler, E. M.
Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

R. D. CULVER, Pres. and Gen'l Man.
I. G. POSTON, Sec'y and Treas.

The Wabash Clay Co.,

MANUFACTURERS OF ALL SHALE

PAVING **BRICKS** AND BLOCKS.

Our leading brands are POSTON BLOCK, WABASH STANDARDS, "SPECIALS," for crossings on macadam streets, GUTTER BLOCKS and COLUMBIAN SIDEWALK BRICK.

Our material has for years successfully stood the heaviest traffic of Indianapolis, Terre Haute, East St. Louis and dozens of other large cities of Indiana and Illinois. We ask investigation and comparison by those seeking the best paving material. Samples furnished on application.

Office and Works at VEEDERSBURG, IND.

Preston Brick Co.,

MANUFACTURERS OF

Vitrified Shale Paving Brick,

SEWER AND HARD BUILDING BRICK.

Hornellsville, N. Y.

T. B. McAVOY, PRESIDENT.
FRANK B. McAVOY, SEC. AND TREAS.

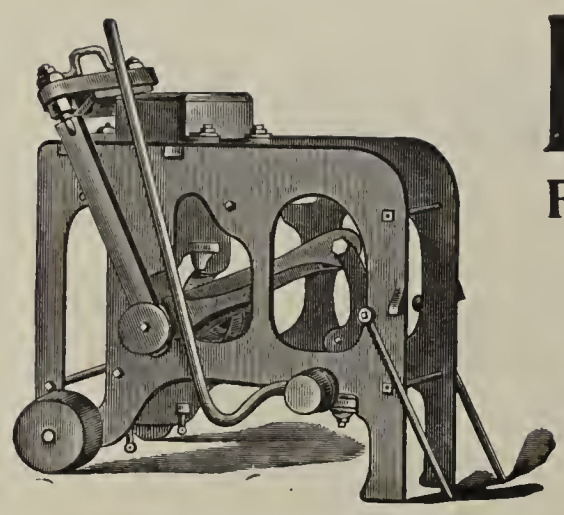
McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.



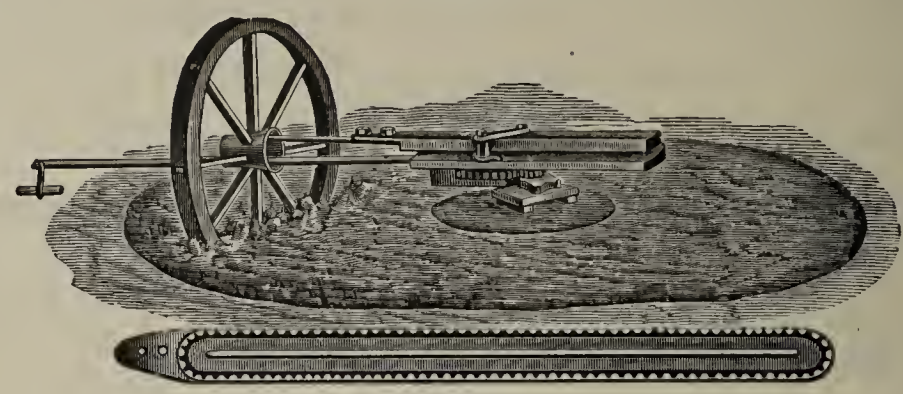
RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

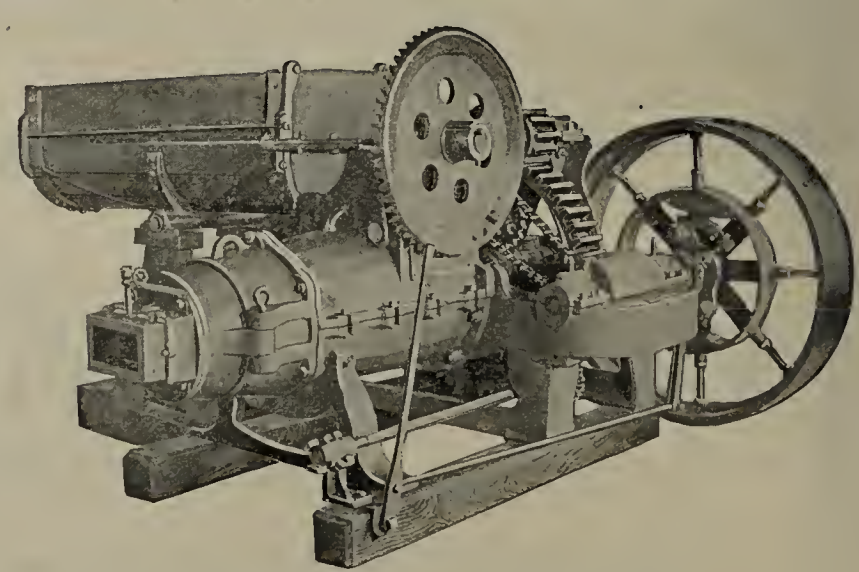
[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED

TAKE A LOOK

At this for a Combined Machine. It has the advantages of other combined machines and others besides. It does not interfere with the stiffness and rigidity of the machine "proper."

The feed end of Pug Mill is clear of all machinery. Pug Mill is hinged so it can be raised clear of Machine, leaving everything free of access.

Let us talk to you about it.



All That Could be Desired.

Kinston, N. C., March 27th, 1900.

Messrs. J. C. STEELE & SONS, Statesville, N. C.

Gentlemen:—We herewith enclose check for $—— in settlement of the brick machine, cutting table, etc., purchased of you a short time ago, for which kindly send us receipt.

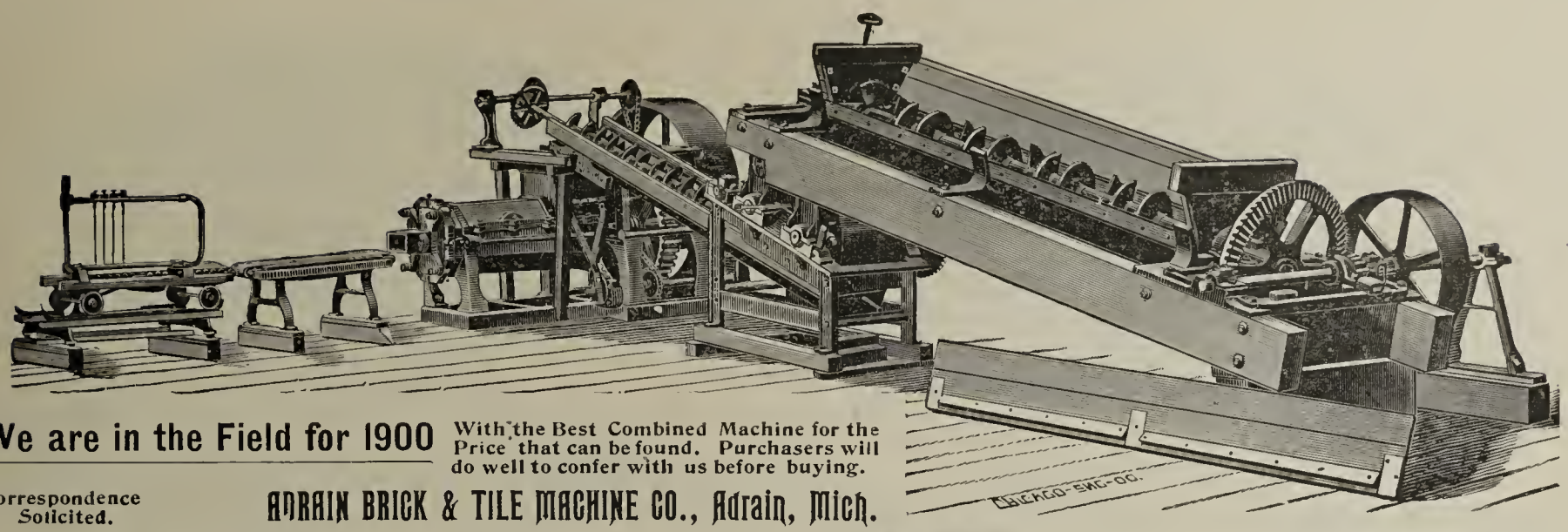
The machine is working well and we are extremely well pleased with it. It is all that could be desired.

Very truly yours, L. HARVEY & SON.

J. C. STEELE & SONS,

Manufacturers of
The "NEW SOUTH" BRICK MACHINERY,

Statesville, N. C.



We are in the Field for 1900 With the Best Combined Machine for the Price that can be found. Purchasers will do well to confer with us before buying.

Correspondence Solicited.

ADRAIN BRICK & TILE MACHINE CO., Adrain, Mich.

La Brique, (The BRICK,)

Prices of Advertisements for One Year:

One Page, $80.
One-half Page, $50.
One-quarter Page, $30.
One-eighth Page, $20.

ORGAN OF THE BRICK AND CERAMIC INDUSTRIES IN THE FRENCH SPEAKING COUNTRIES.

Published each Month. Annual Subscription $1.50.

5,500 copies sent by post and guaranteed by receipt from Postmaster general. All correspondence to be addressed to

Mr. H. DeWit,

61 Rue Bodeghem, Bruxelles, (Belgium.)

Outing BICYCLES.

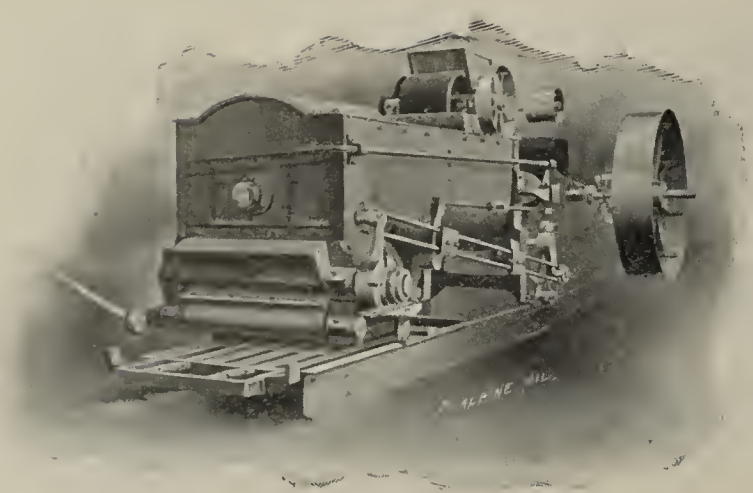
HAVE bearings as near perfection as they can be made. We do not claim them absolutely dust proof. This high standard is not attained even in a fine watch. We do claim that there are no better bearings on the market. This is merely one of the many attractive features of the **Outing.** Our catalogue will tell you of others.

Chainless $75.00.
Racer $60.00. Cushion Frame $60.00.
Road Wheels $50.00, $40.00, $30.00.

OUTING M'F'G. CO.,

Indianapolis, Ind.

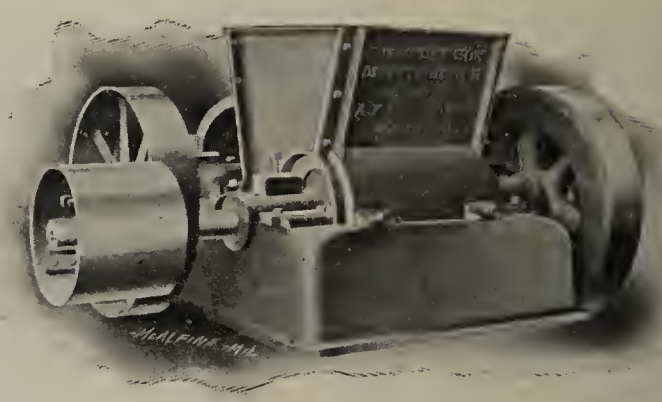
Ask the Publisher of this Paper what he thinks of the "OUTING."



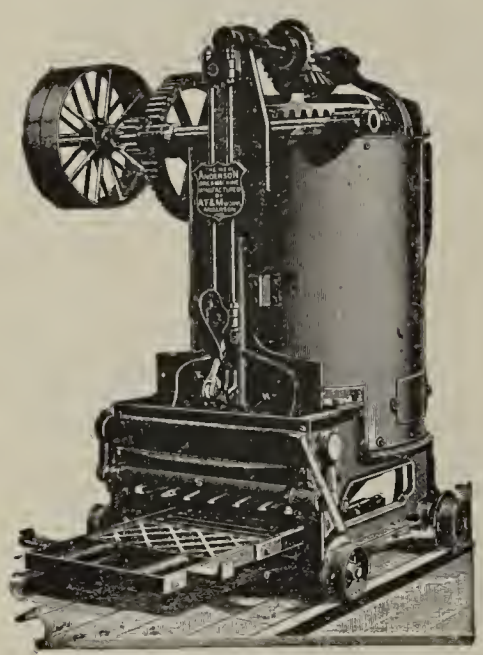
Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



Best Disintegrator on the Market.



Steel and Iron Upright Stock Brick Machine.

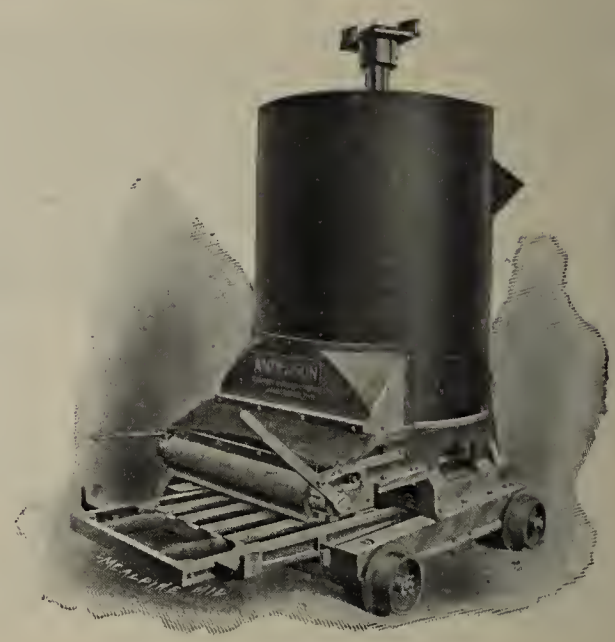
MANUFACTURERS OF . . . .

New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,

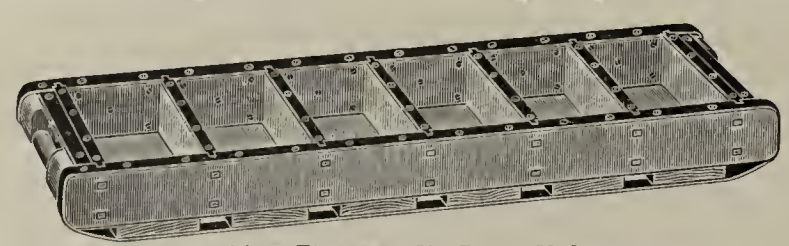
And all Brickyard Supplies.



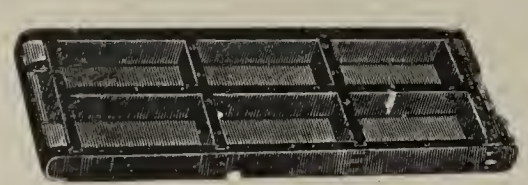
1899 Horse Power Machine.

The Anderson Foundry and Machine Works,

Anderson, Ind.

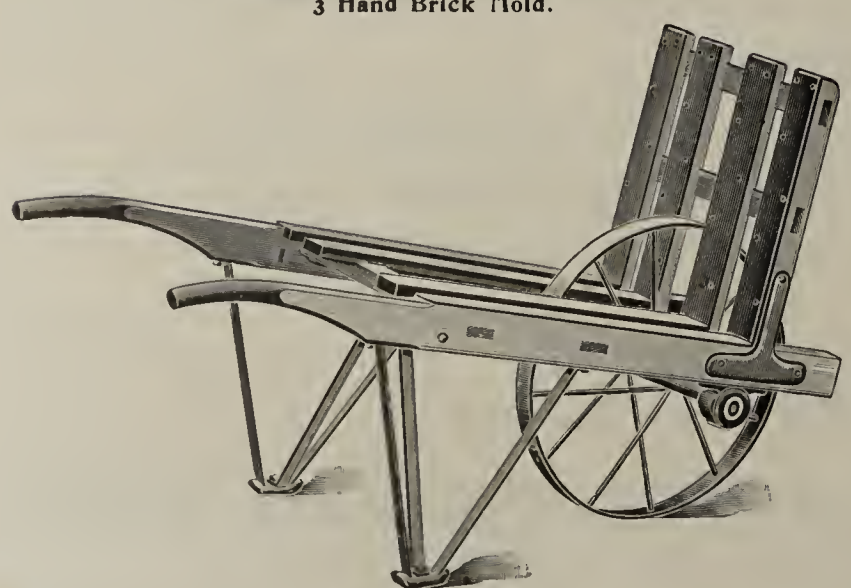


Machine, Five and Six Brick Mold.



6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

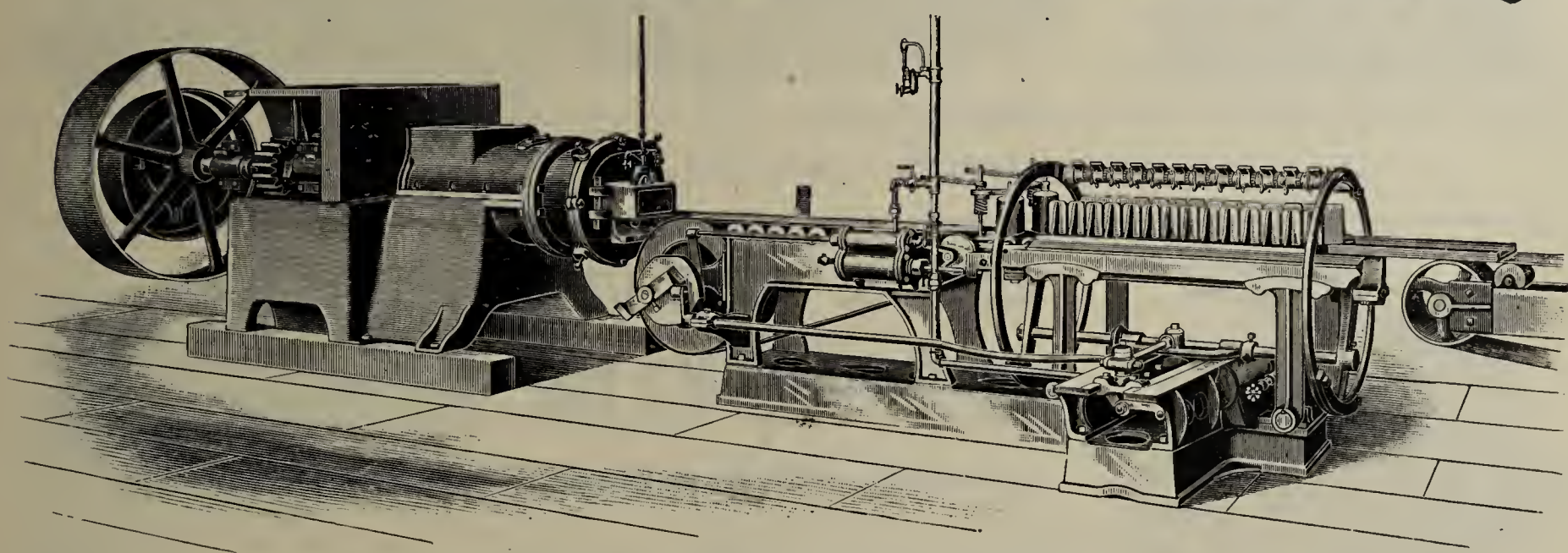
D. J. C. ARNOLD,

New London, O.

You Obtain More for Your Money

(When Purchasing)
(While Using)

Leader Machinery

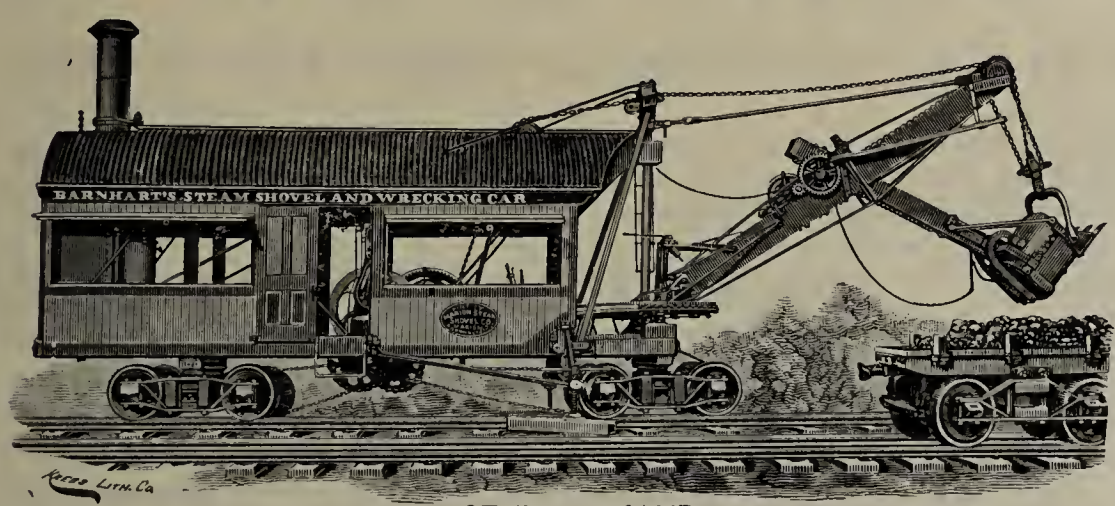


Leader No. 25 with Side Cut Die and Automatic Cutter.

LEADER MACHINES are most economical because they are properly designed and well built. They do good work with least waste. Printed matter illustrating and describing **Leader Brick Machines, Pug Mills, Crushers, Presses,** etc., free.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

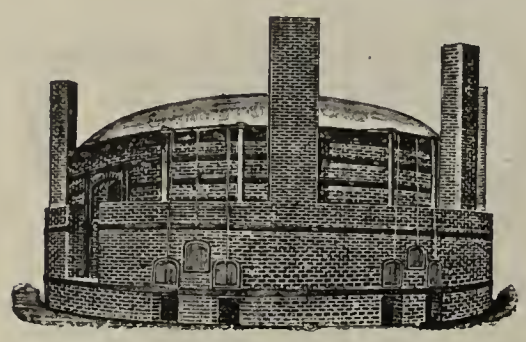
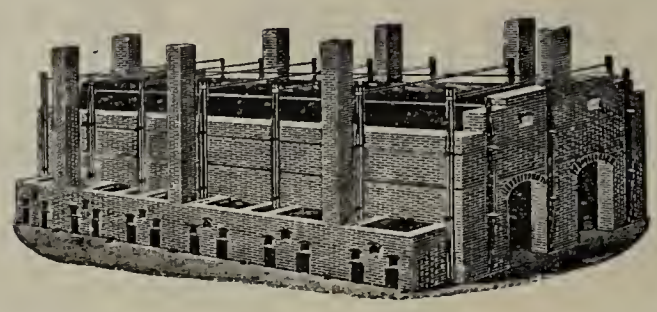
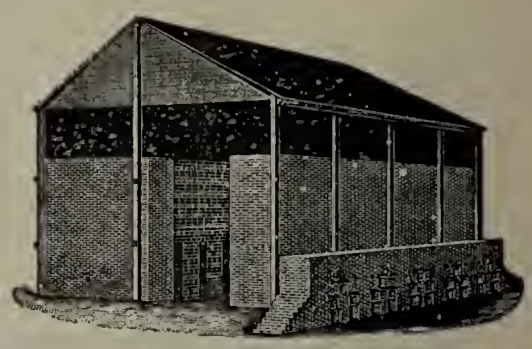
STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

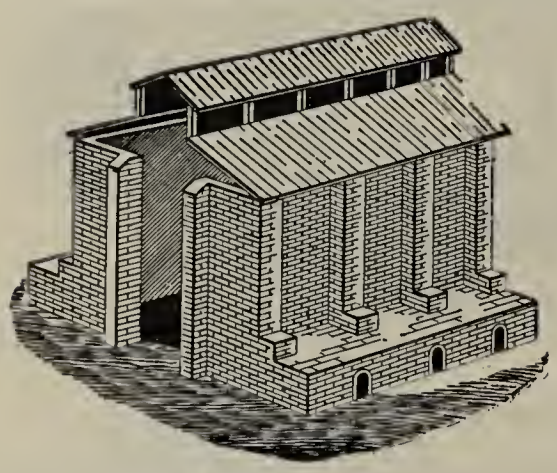
603 West Center Street, - MARION, OHIO.

The THREE KINGS.

SWIFT SLACK COKING TABLE FURNACE KILNS. Over 700 old kilns changed and many new ones built in the past year. Send for Catalogue and Price List of Plans and Specifications.

F. E. SWIFT, Washington, Iowa. U. S. A.

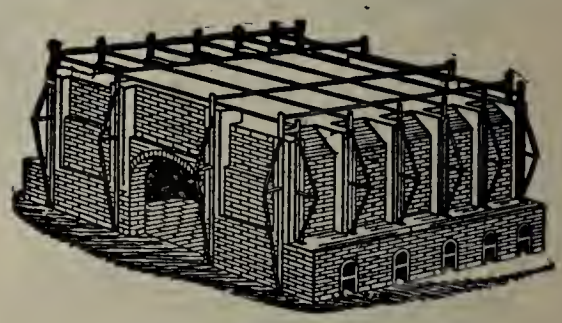


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL,* 2,422 Chestnut St., *Kansas City, Mo.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

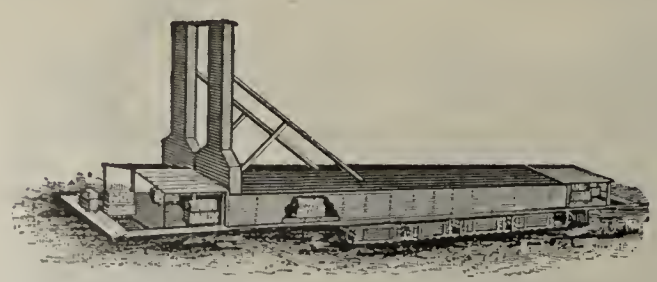
Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

A. F. BARRON,

Patentee and Builder of the

CHICAGO IRON CLAD and BARRON'S TENDER CLAY DRYERS.

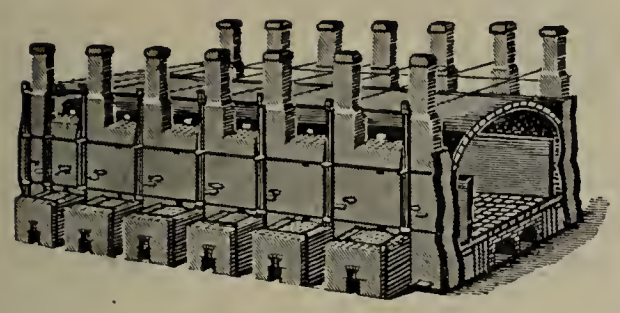


These are the gradual outgrowth of a correct principle patented 28 years ago. Every year since that date has witnessed improvements that has kept this system beyond the reach of competition and we now can build Dryers to dry clay products of every grade, even if the clay is of a tender nature. The original principle is still retained. Crude methods of application displaced by money saving devices in steam fitting and construction—enabling patrons to turn out clay products of highest grade in strength and color and at a great saving in expenditure of fuel. In seeking information mention the peculiar nature of the clay, process of manufacture, etc. Address,

A. F. BARRON.

Temple Court Building. **CHICAGO, ILL.**

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Oaks, Pa., January 26, 1900.
M. M. BUSHONG, Phoenixville, Pa.

Dear Sir:—Your letter of inquiry of the 25th inst, in regard to kiln received; in reply will say it gives us great pleasure to say that your kiln is doing splendid work, we have made eleven (11) burns and they were all a great success, in fact it surpassed our expectations in every particular, both to quality of paving brick produced and the amount of coal consumed and we contribute its success to the perfect system of drafts and absolute control of same. In other words if your kiln does not burn evenly from top to bottom or wall to wall it is the fault of the man in charge and not the kiln.

We have had a wide experience in the kiln line and do not hesitate to say that your kiln is the best for burning Shale Paving Brick to be found.

We can assure you that in the future should we build more kilns they will be the **Bushong Down Draft.** Wishing you success we remain,

Yours respectfully,
PERKIOMEN BRICK CO.,
Per HAGGINBOTHAM, Supt.

BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.

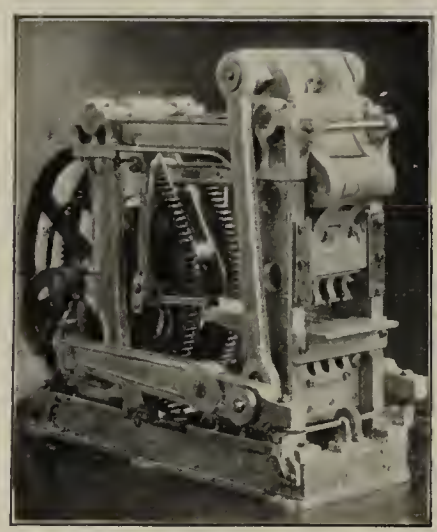
These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

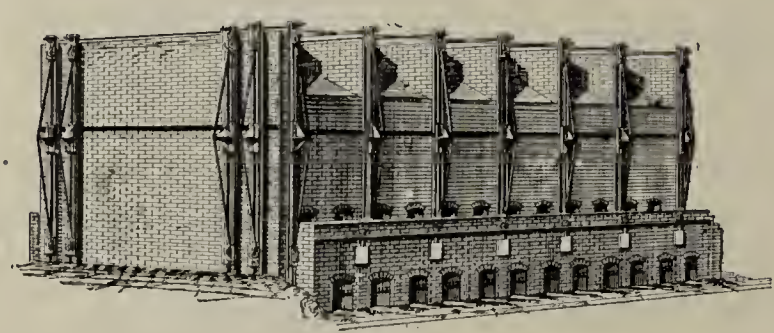


The GRATH DRY CLAY BRICK PRESS.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

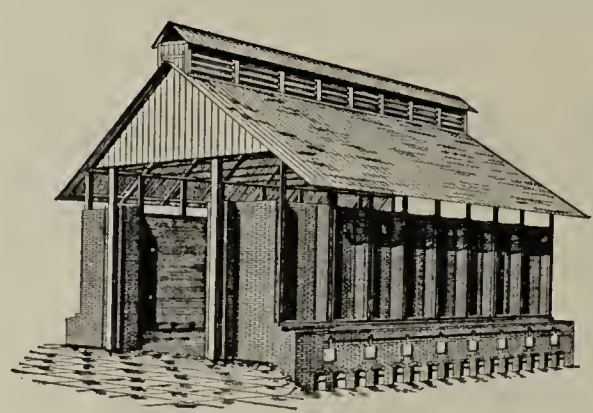
Features:

1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Requires less power to Operate.
5th. Brick free from Granulation.
6th. All Bearings Bushed.
7th. All parts Accessible.
8th. Thickness of Brick Changed without Stopping.
9th Master Wheels Close to Bearings.
10th. No Working parts under Lower Cross Head.



The GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH GRATH GAS AND COKING FURNACES ATTACHED Built Round, Square and Continuous. Perfect results guaranteed. No soft, overburned or flashed brick, uniform throughout.

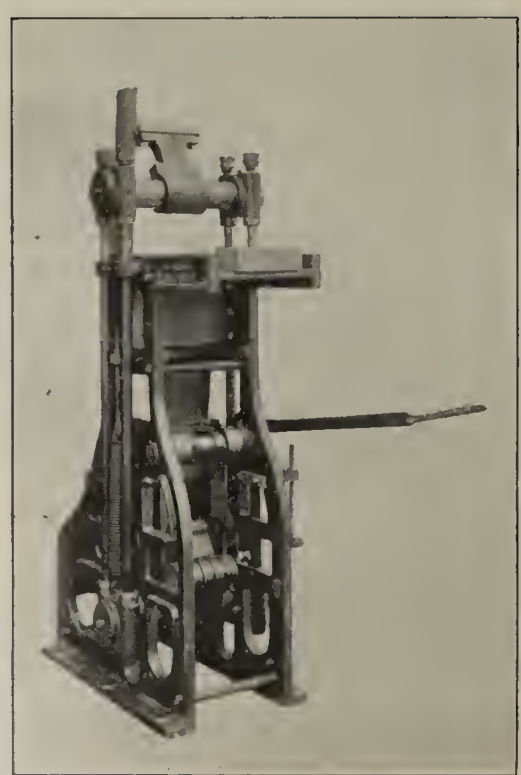


The Grath Up-Draft Kiln.

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with slack coal, with better results than lump coal in ordinary Furnaces and without any black Smoke.

The Grath Gas and Coking Furnaces

Can be attached to ALL kinds of Kilns, either old or new, and produce better results with SLACK than lump coal in ordinary furnaces. PROTECTION GUARANTEED TO ALL USERS. WILL PROSECUTE ALL INFRINGEMENTS.



The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK. The only successful Press of its kind in the market.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

The Coffeyville Vitrified Brick and Tile Co.

MANUFACTURERS OF

Repressed Vitrified Paving, Building and Face Brick and Drain Tile

Plants at Coffeyville, Cherryville and Independence, Kan. Daily Capacity 325,000

W. P. GRATH, Pres., Coffeyville, Kansas, April 30, 1900.
The ILLINOIS SUPPLY & CON. Co., ST. LOUIS, MO.

DEAR SIR—Replying to your favor of the 24th inst., we are very much pleased to state that the Hand Power Press which we purchased from you is giving perfect satisfaction, and is making a very fine grade of ornamental brick, with less than half of the expense and more than double the capacity of the screw press.

Wishing you success in the sale of this machine, we are

Yours very truly, THE COFFEYVILLE VITRIFIED
Per W. H. MAHAN, Gen'l Mngr. BRICK & TILE CO.

For Further Information and Catalogue on Above, address

The Illinois Supply & Construction Co., ST. LOUIS, MO., U. S. A.

Mention The CLAY-WORKER.

BEHOLD!

Is it not Written?

If Ye Have Aught to Do

DO IT.

You Know

Hot Air Is necessary for the drying of brick

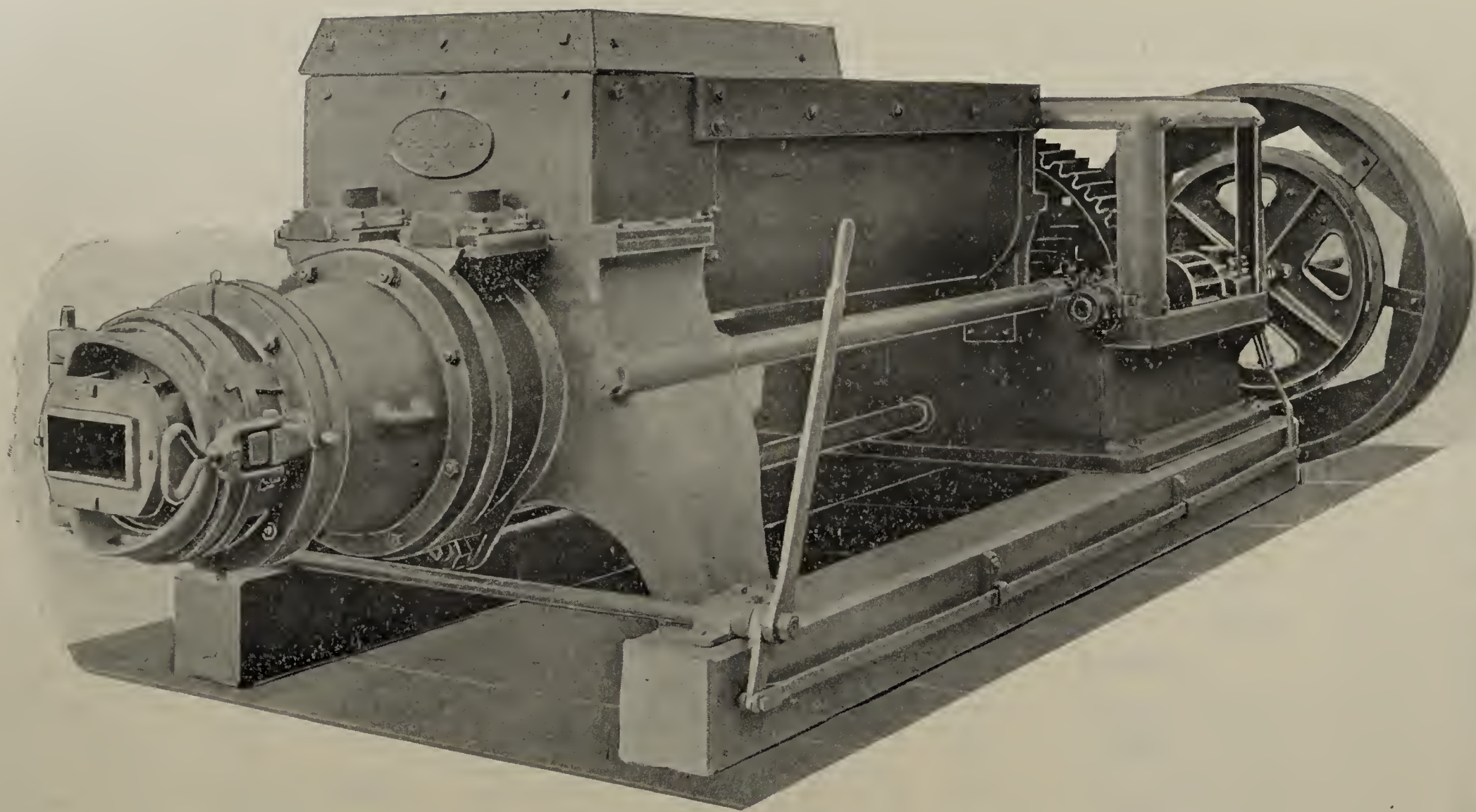
Why Not Heat the **Air** instead of heating water to make Steam, and then attempting to radiate the heat from several miles of steam pipe?

Others are saving **$15.00 per day** by the use of our **Buckeye Dryer,**

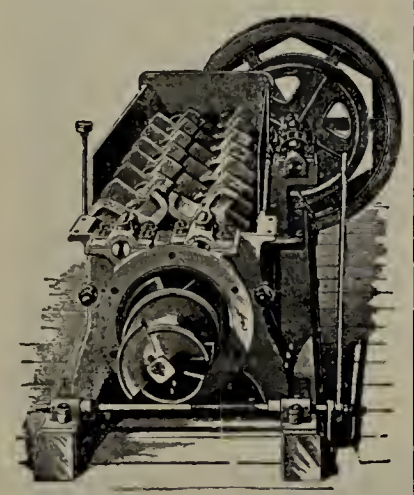
Why Not You.

Write Us and we will do the **Rest.**

The CLEVELAND CAR CO.,
CLEVELAND, OHIO.



INTERIOR VIEW OF ABOVE MACHINE.



Ready for the Battle! Prepared for the Conflict! Eager for the Fray!

Strong, Steady, Hardy, Well Equipped. Disciplined to Perfect Behavior. Fearless. That's our **Premier.** Note the Interior arrangement. Pugging more than doubled. Capacity 75,000 brick per ten hours. Write to us for more points.

J. D. FATE & CO.,

Manufacturers of

"PLYMOUTH" BRICK and TILE MACHINES

BENSING'S AUTOMATIC TABLES and other Yard Supplies and Equipments.

PLYMOUTH, OHIO,

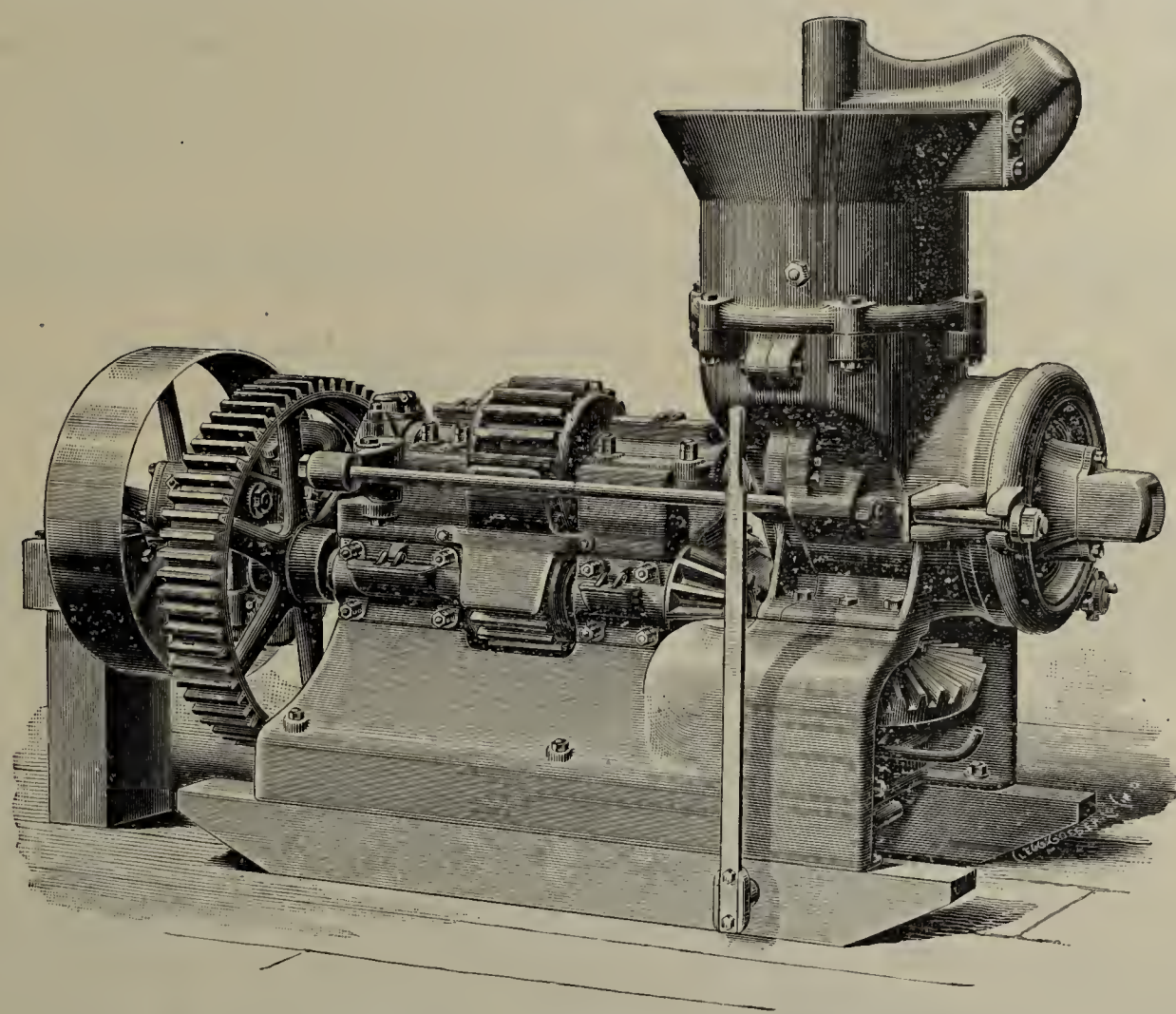
Richland Co. U. S. A.

Western Representative, B. E. LaDOW, 405 Chamber of Commerce, Chicago, Ill.

Wonder Brick Machinery.

SOLD ON ITS MERITS.

SEND FOR CATALOGUE. **WRITE FOR PRICES.**



Intermediate Wonder Brick Machine.

BE PROGRESSIVE—There is nothing gained by staying in the back ground. Life is what we make it, and the enviornments have a great deal to do with the disposition.

Make life pleasant by having your surroundings up-to-date.

You can do this by buying a Wonder Machine.

The **WONDER** is no experiment, having been on the market some fiifteen years, and each year it is improved and brought up to the latest mechanical ideas.

The Wallace Mfg. Co.,

Frankfort,

Indiana.

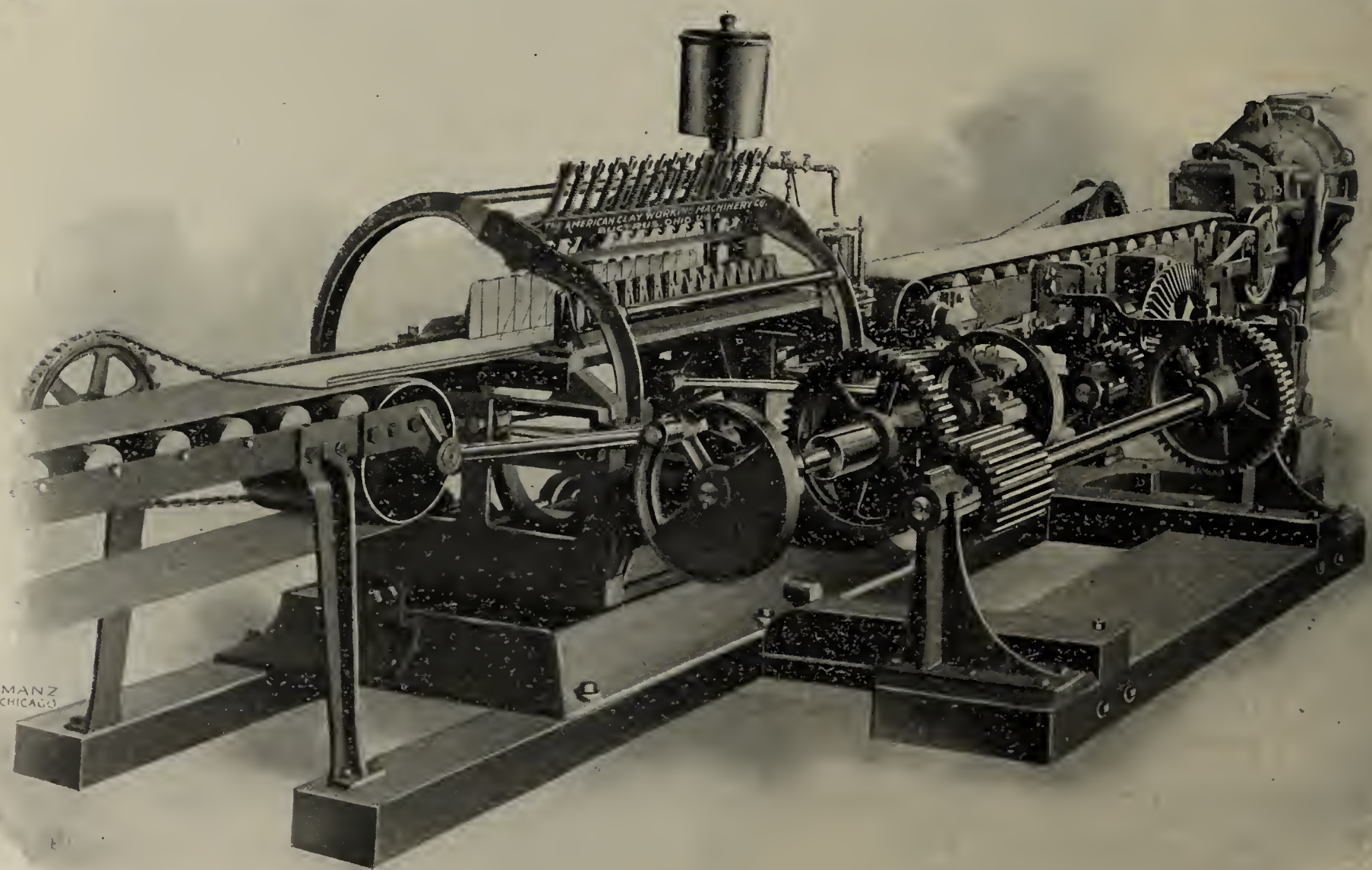
WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

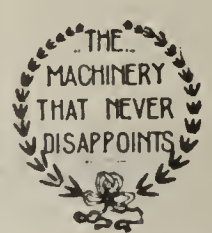
SOUTHERN MACHINERY CO., Charlotte, N. C., Agents for Tennessee, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina and Virginia.

Make Him Write It In the Contract.

DURING THE PAST FEW WEEKS a purchaser, who wanted to be sure of his purchase, stipulated in his contract that the machinery must be guaranted to be as good in every way as that manufactured by the **AMERICAN CLAY-WORKING MACHINERY CO., of Bucyrus.** The manufacturer accepting this order puts his name to the acknowledgement that our line is the **Standard of Excellence**. Not only that, but if the contract is lived up to—to the letter—he will have to take out his machinery because there is no other line of clay-working machinery equal to that of the American Co. It may appear to be as good but its the ceaseless operation, year after year, which shows the quality of material and faultless construction of our machines. Its a safty factor to yourself to be protected. If some other manufacturer claims his machinery is "just as good" as the American line, **make him write it in the Contract,** and make him **FULFILL THE GUARANTEE.**

Our new side cut **Oscillating Automatic Down Cut Table** is the cutting table success of late years. Its a machine to be pround of from start to finish. If your not informed regarding its advantages write us. We manufacture a full line of clay-working machinery and appliances. Make your wants known or send for our catalogue.





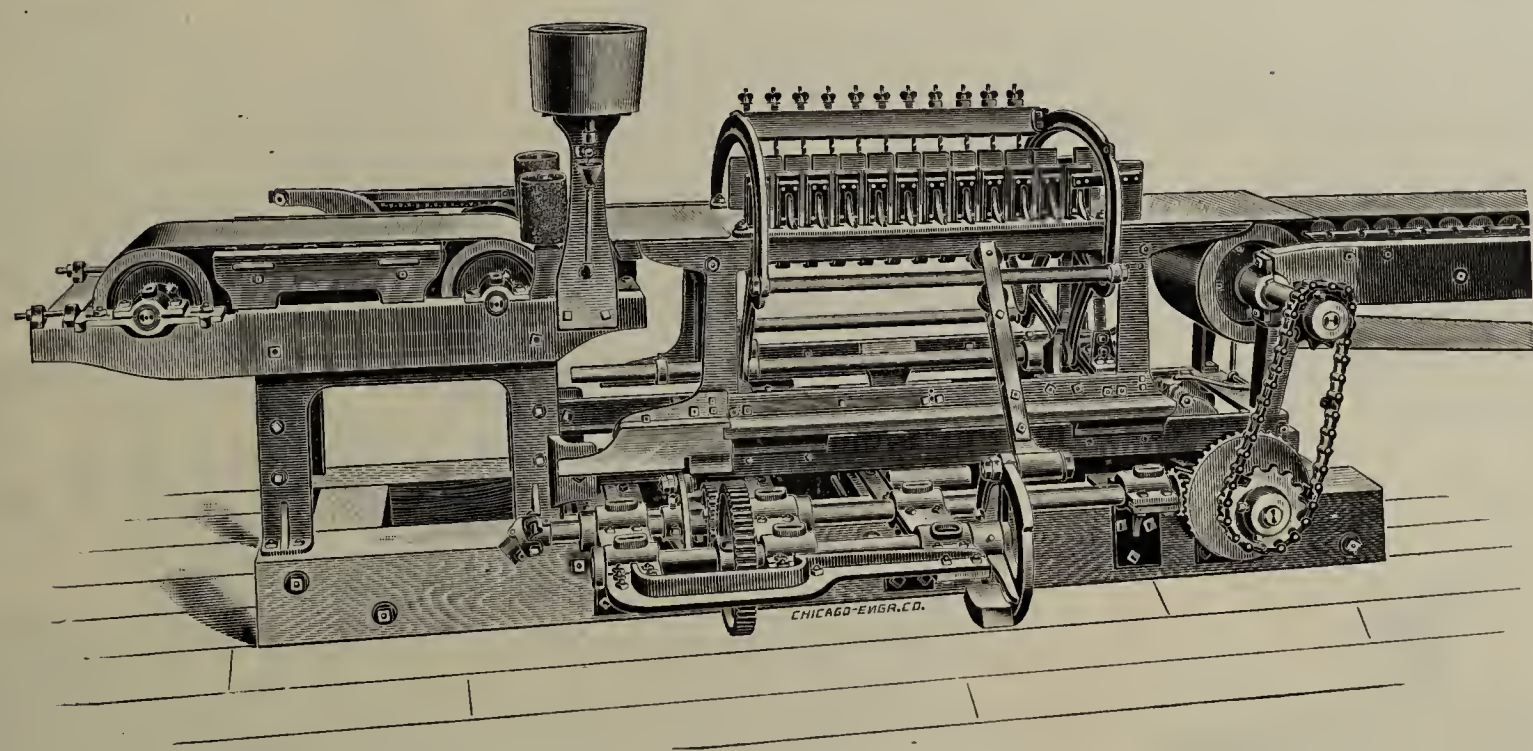
The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

NEW YORK OFFICE, 39 and 41 Cortlandt St.

A Cutter That Cuts,

And keeps cutting, this season, next season, and to a "Fare ye well." A Cutter that cuts brick all of a size, all of the time and all you can handle, and one that takes the warp out of crooked brick before it gets there.



The BREWER No. 60 AUTOMATIC CUTTER.

A Cutter with a short wire, a small wire and a wire easily replaced while running, and one that runs easily, quietly, and smoothly without jump, jar, rattle, bang or breakage. A Cutter that suits the brickmakers, for they say so.

Send for Catalogue and Prices.

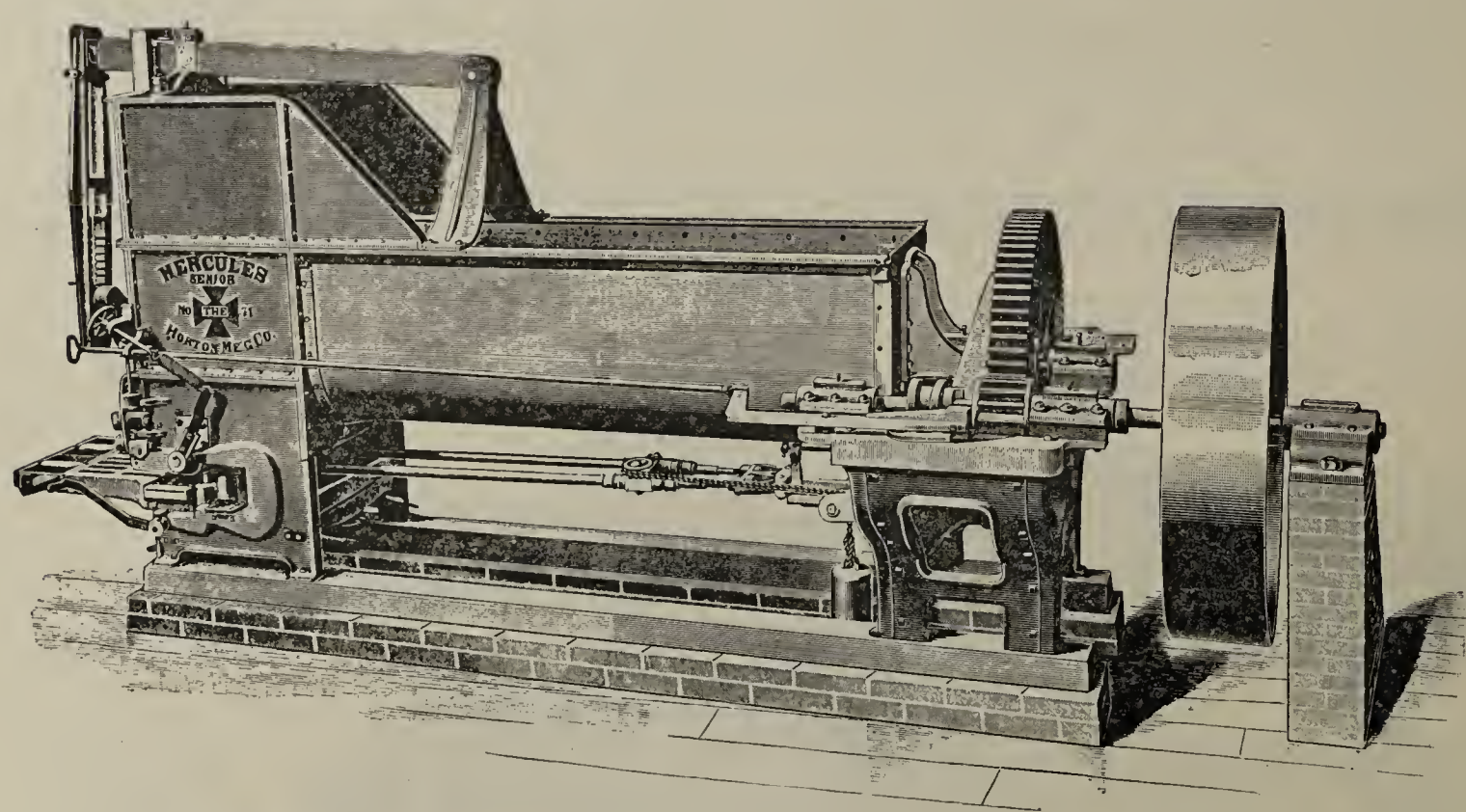
H. BREWER & CO.,

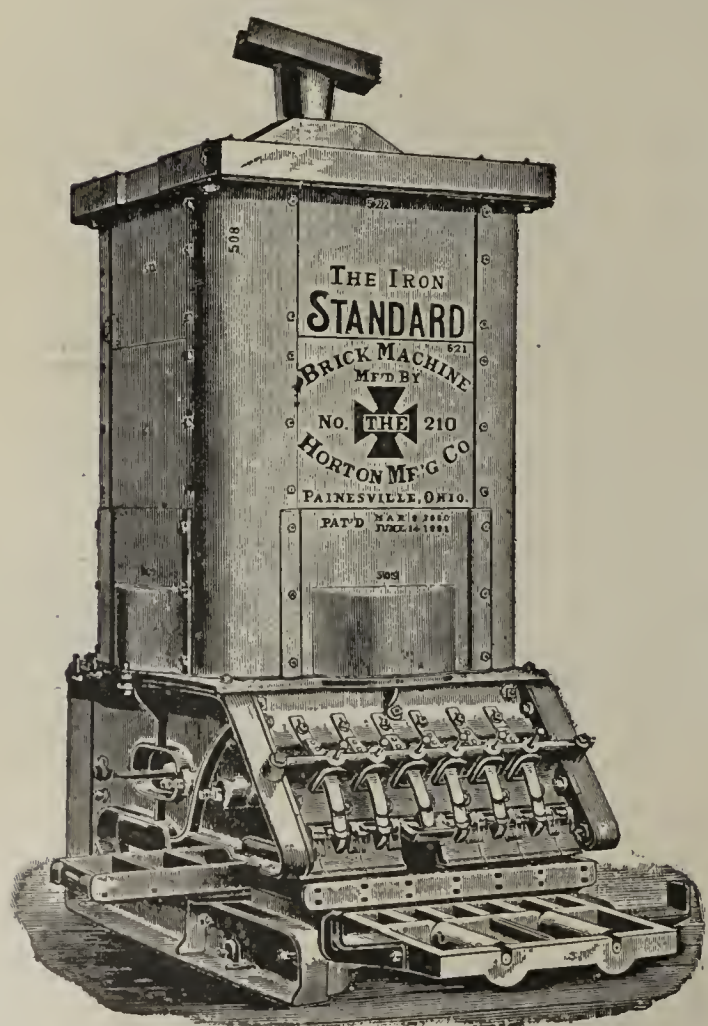
TECUMSEH, MICH., U. S. A.

Our Brick Machine Family.

THE BEST IN THE WORLD.

HERCULES





RON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brickyard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

EVERY-THING A BRICK-MAKER NEEDS.

FOR A COMPLETE

Brickyard Equipment

IT WILL PAY YOU TO CONSULT

THE HENRY MARTIN BRICK MACHINE MFG. CO., INCORPORATED.

LANCASTER, PENN., U. S. A.

Soft Mud Brick Machinery.
Pug Mills.
Disintegrators.
Dry Pans.
Clay Screens.
Mould Sanders.

We carry in stock the most complete line of

Brickyard Supplies

Which are furnished at the Rock Bottom Prices.

Have you received our general Catalogue No. 40? If not, send for a Copy.

MARTIN

LANCASTER.

Some Interesting Reading

As well as Fair Warning to All.

The Patents Owned by

C. & A. Potts & Co.,

Are declared Valid by The Highest Courts in Our Land.

Don't take chances of Purchasing other so-called Disintegrators, you are Liable to get into Trouble. You take no risk when Purchasing a POTTS, Neither of Infringements Suits or quality. They are The best on EARTH.

UNITED STATES CIRCUIT COURT,
Southern District of Ohio, Western Division.

C. AND A. POTTS AND CO.,
vs.
FRANK F. CREAGER,
HARRY M CREAGER and
JONATHAN CREAGER.
No. 4,244.
In Equity.

PERPETUAL INJUNCTION.

THE PRESIDENT OF THE UNITED STATES OF AMERICA
TO
Frank F. Creager, Harry M. Creager and Jonathan Creager, their clerks, attorneys, servants, agents and workmen, and any and all persons acting by, through or under the authority of said defendants or either of them.

WHEREAS, it has been represented to us in the Circuit Court of the United States for the Southern District of Ohio, Western Division, on the part of C. and A. Potts and Co., complainant, that it has lately exhibited its Bill of Complaint against you, the said Frank F. Creager Harry M. Creager and Jonathan Creager, defendants, to be relieved touching the matter therein complained of, in which Bill it is stated, among other things, that Letters Patent of the United States No. 322,393, for Improvements in Clay Disintegrators, were issued on July 14, 1885, in due form of law, to Clayton Potts and Albert Potts, and that said Letters Patent have been properly assigned to and are now owned by the said C. and A. Potts and Co., the complainant herein, and that you, the said Frank F. Creager, Harry M. Creager and Jonathan Creager, have infringed the rights secured by the aforesaid Letters Patent, by making and selling to others Clay Disintegrators embodying the invention set forth and claimed in the said Letters Patent, contrary to the form of the statutes in such cases made and provided, and that your said acts and doings in the premises are contrary to equity and good conscience.

Now, therefore, in consideration thereof, and of the particular matters in the said Bill set forth, you, the said Frank F. Creager, Harry M. Creager and Jonathan Creager, your clerks, agents, attorneys, servants and workmen, are strictly commanded and enjoined under the pains and penalties which may fall upon you, and each of you, in case of disobedience, that you forthwith, and **perpetually** hereafter until the expiration of said patent, absolutely desist and refrain from any further manufacture, sale or use in any manner of the patented improvements, or any part thereof, in violation of the rights of the said C. and A. Potts and Co. under the said Letters Patent of the United States No. 322,393.

Witness, the Honorable MELVILLE W. FULLER, Chief Justice of the Supreme Court of the United States, and the seal of the Circuit Court of the United States for the Southern District of Ohio, Western Division, this 27th day of March, A. D. 1900, and the one hundred and twenty-fourth year of the Independence of the United States of America.

B. R. COWEN,
[SEAL] Clerk.

Received the writ at Cincinnati, Ohio, on the 28th day of March, 1900, and on the same day served the same on the within named Harry M. Creager and Frank F. Creager, by handing to each of them personally a true copy of this writ with all the endorsements thereon. And on the 30th day of March, 1900, I served the same on the within named Jonathan Creager by leaving a true copy of this writ with all the endorsements thereon at his usual place of residence, placing same in the hands of his wife.

V. J. FAGIN. U. S. Marshal S. D. O.
By W. J. Sanderson, Deputy.

Southern District of Ohio, } ss.
Western Division. }

A true and correct copy of the original Perpetual Injunction on file in the Clerk's office of the United States Circuit Court at Cincinnati, Ohio.

Attest: B. R. COWEN, Clerk,
By Robt. C. Georgi, Deputy.

MANUFACTURED ONLY BY

C. & A. POTTS & CO., = Indianapolis, Ind.

BRICK MANUFACTURERS CANNOT AFFORD TO IGNORE THE SPLENDID QUALITIES OF THE CLAYWORKING MACHINERY MANUFACTURED BY **C. & A. POTTS & CO.**

Horizontal Stock Brick Machines.

All Iron or Wood Frame.

PUG MILLS, DISINTEGRATORS, MOULD SANDERS, and all Brick-yard Supplies.

They have invariably become recognized leaders in every locality, invincible in the yards and in all contests, winning their way by fine work and lasting qualities and positive economy. They are up-to-date, progressive machines, with all the latest improvements. Well Built, Strong and Durable.

There have been more Potts Machines sold this season than ever before fully one-half of which have gone to yards to replace machines which were sold last season because they were "just as good" as the Potts, and cheaper.

Reese-Hammond Fire Brick Company.

Capital Stock $500,000. **Annual Capacity, 50,000,000.**

BOLIVAR, PA., June 26, 1900.

C. & A. POTTS & Co., Indianapolis, Ind.

Gentlemen:—We have your esteemed favor of the 22nd, in reply we are pleased to state that the reports we have received from your machine are most gratifying. From the reports of our superintendent the results are entirely satisfactory, and we can assure you that it gives us great pleasure to be able to make such a report to you.

Yours respectfully,
REESE-HAMMOND FIRE BRICK CO.

THE ABOVE LETTER IS FROM A VICTIM WHO TRIED ONE OF "THE JUST AS GOOD" MACHINES LAST SEASON. LET US TELL YOU WHY THEY MADE THE CHANGE.

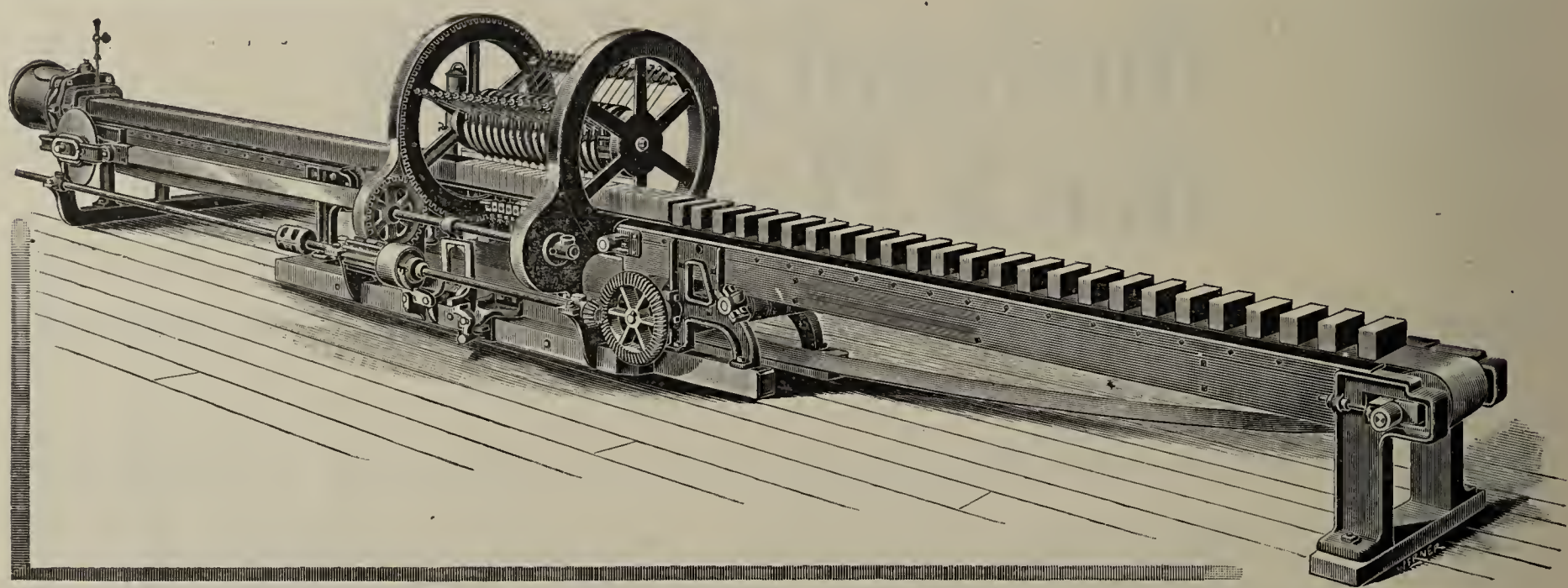
C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE

INDIANAPOLIS, IND.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

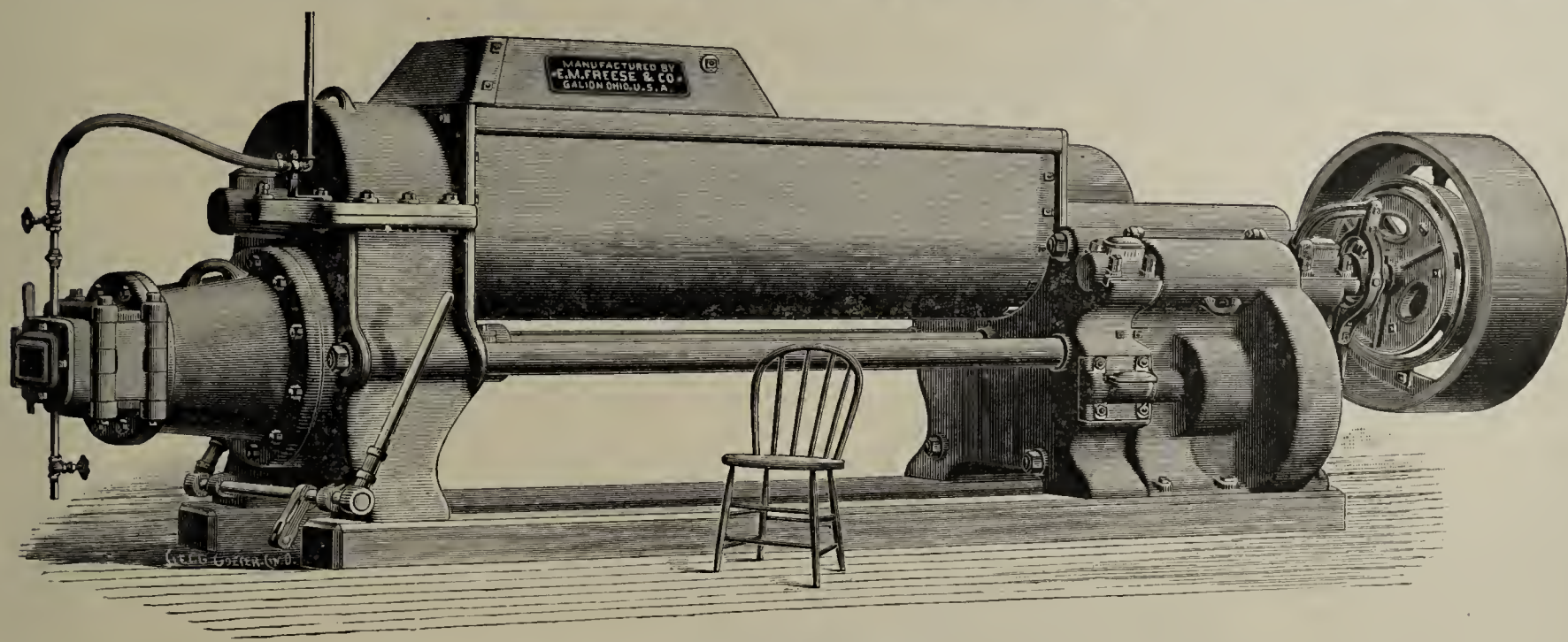
POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

E. M. FREESE & CO.,

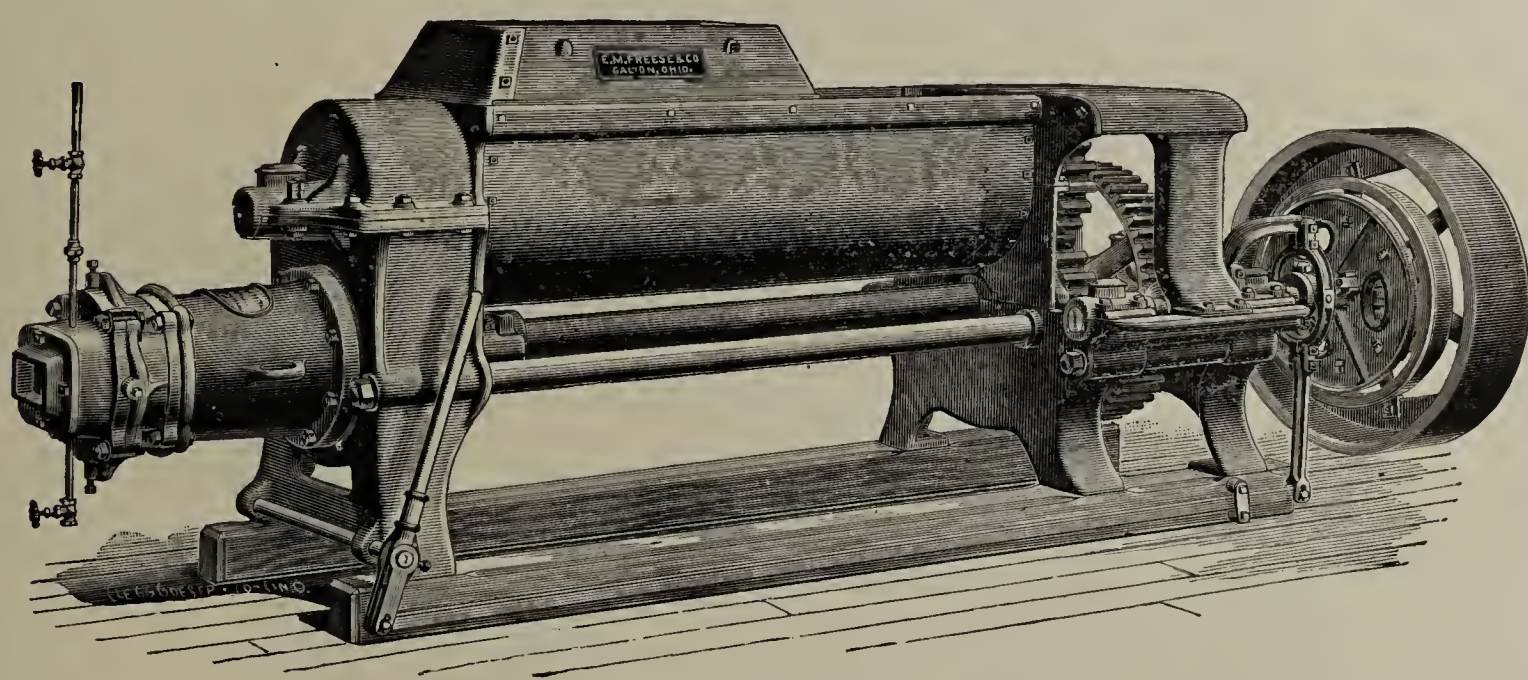
Galion, Ohio.

The Original Union Brick Machines



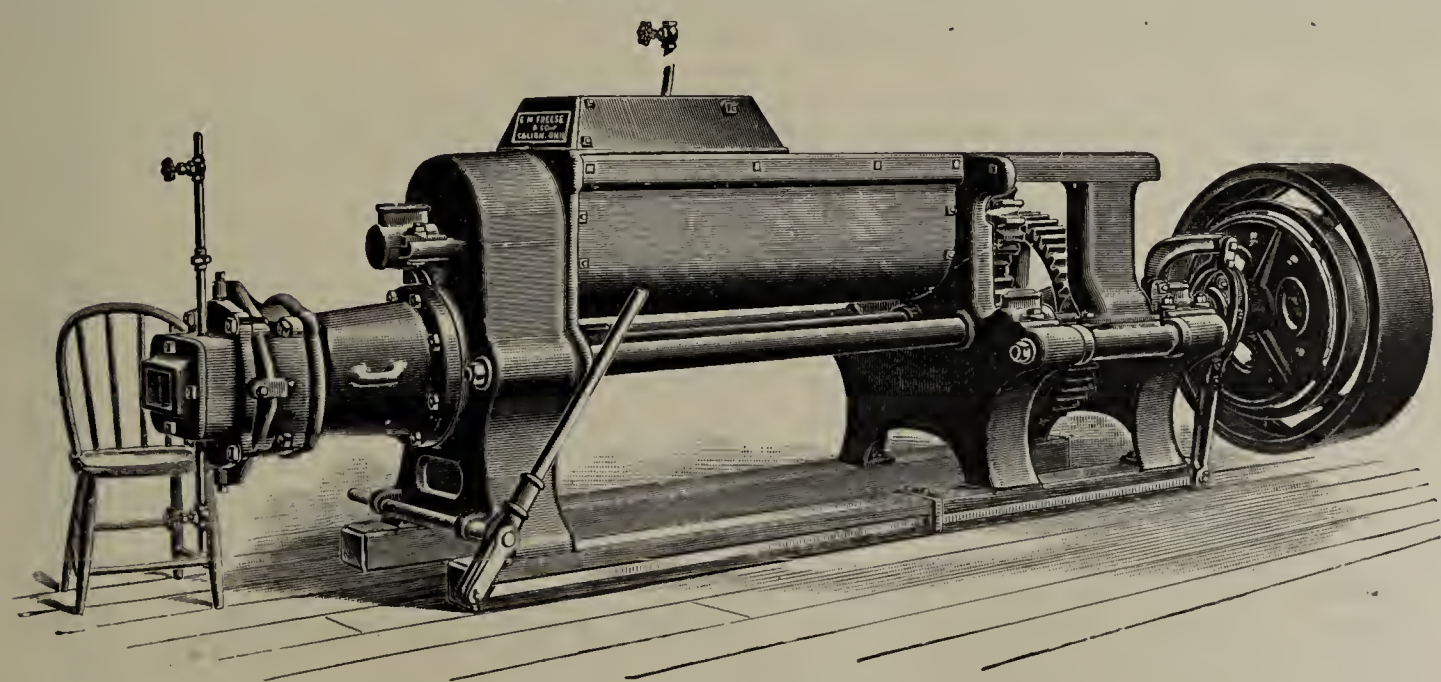
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

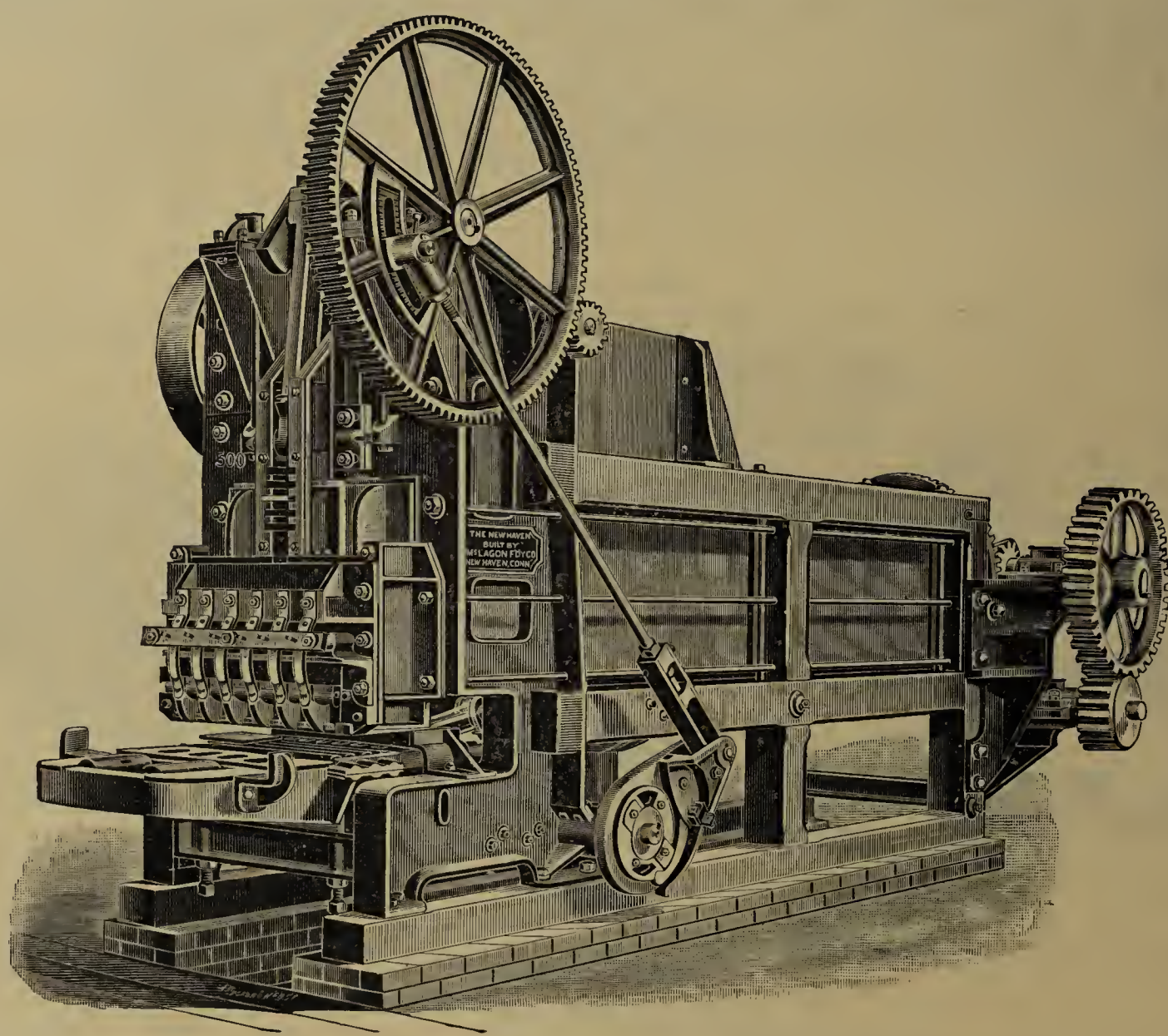
They are a SUCCESS Investigate them.

No separate Pug Mill required.

E. M. FREESE & CO., Galion, Ohio.

"The Lamp of Experience."

Which we published recently and which may be "HAD FOR THE ASKING"
Is full of Interesting Facts for Brickmakers. Note the Quotation below.



AFTER TEN YEARS.

Lebanon, N. H., October 12, 1899.

The EASTERN MACHINERY CO., New Haven, Conn.

Dear Sirs:—I have just COMPLETED MY TENTH YEAR with machine, and IT HAS DONE JUST AS GOOD WORK AS THE FIRST YEAR. It is PERFECTLY SATISFACTORY.

Yours,

JASON DENSMORE.

"NEW HAVEN" Brick Machinery is Sold Exclusively on its Merits.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

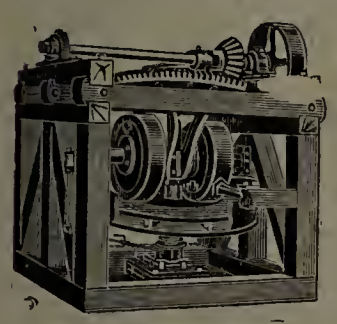
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

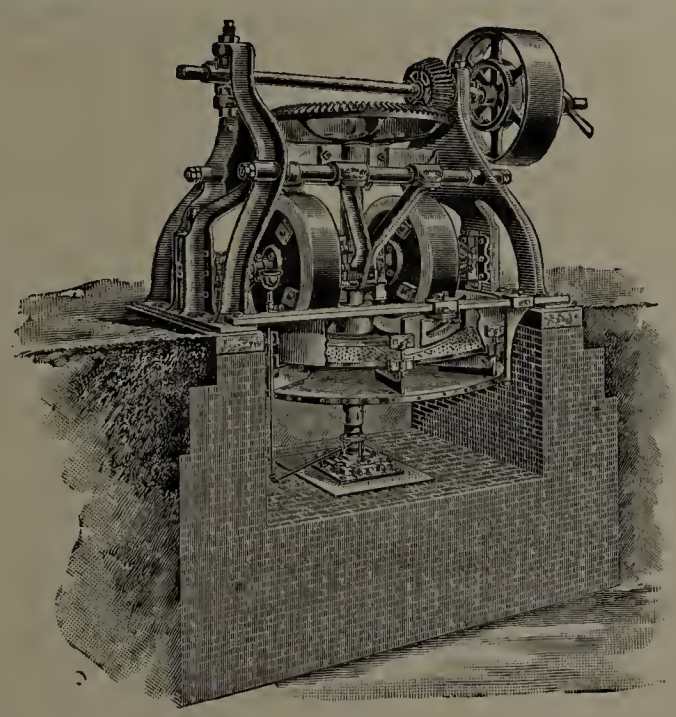
MANUFACTURERS OF

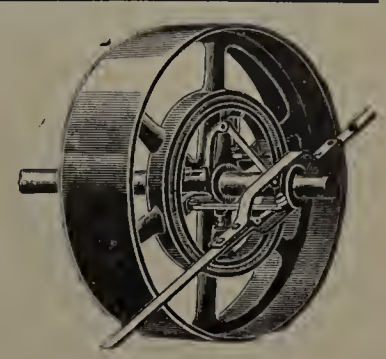
Brick Machinery.

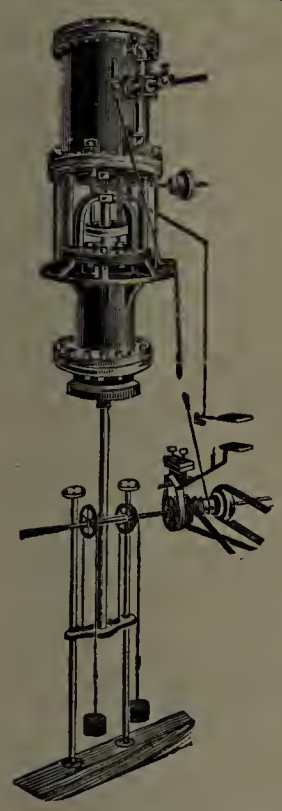
COMPLETE EQUIPMENTS.

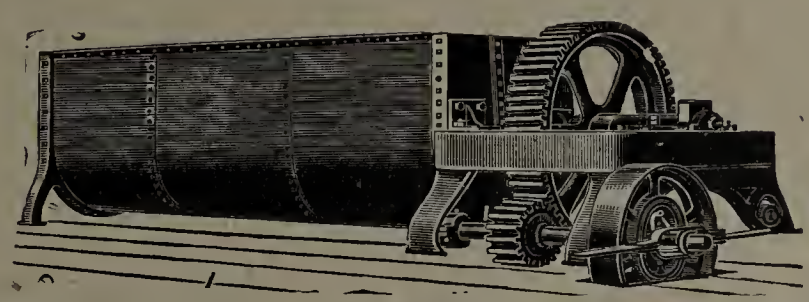
Tile Machinery











Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

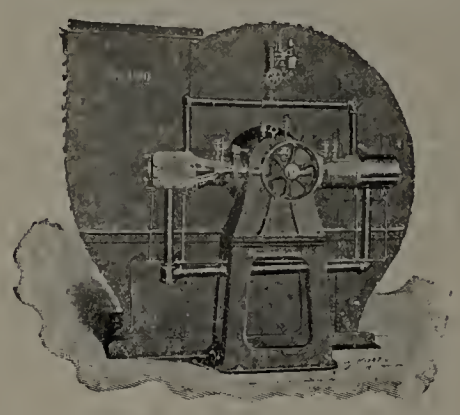
The ONLY SUCCESSFUL

Waste Heat Brick Dryer

...IS THE...

"A. B. C."

Read what Its Users Say of It.



The Iowa Brick Co., Des Moines, Iowa., write as follows:

"In regard to the Blower outfit recently furnished us by your company for utilizing the waste heat from our cooling Kilns, we wish to say that it gives better satisfaction than we anticipated. The special construction of the Blower is very desirable. We have tried various steam dryers, but this is so much more satisfactory that we would not put one in again if the company would furnish it for nothing and pay for operating it. We would recommend the Blower System to everyone who wishes to dry brick at one-fourth the cost of the steam system."

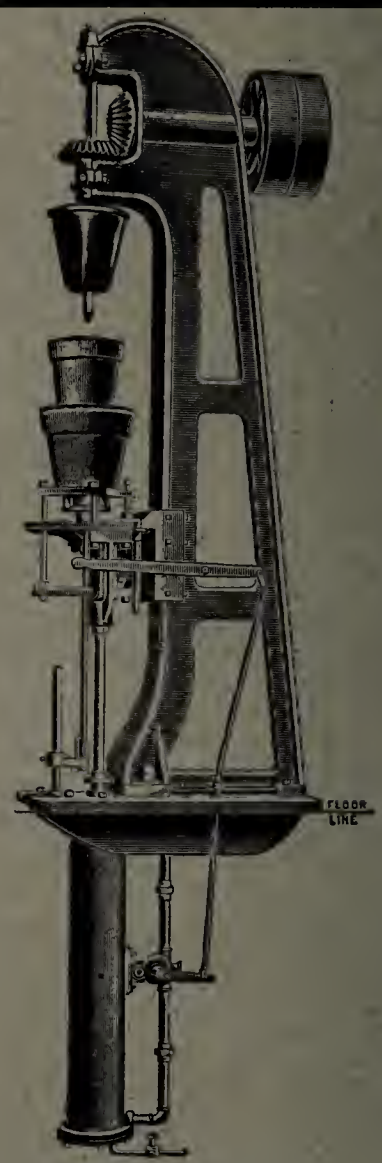
American Blower Company,
Detroit, Michigan.
New York. Chicago. London.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS, OHIO, U. S. A.

MANUFACTURERS OF ALL KINDS OF

Clayworking Machinery.



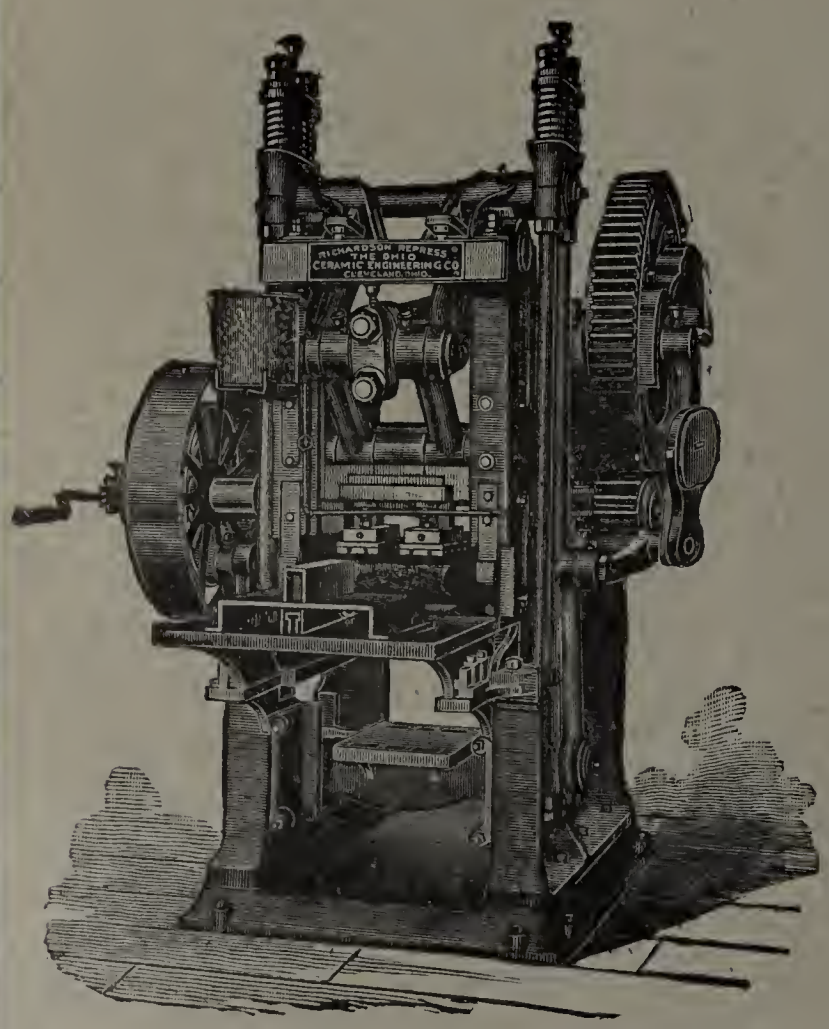
The accompanying cut shows our improved machine for making

Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.

DONT FAIL to get OUR PRICES If you want the BEST MACHINERY.



The RICHARDSON REPRESS.

If it won't do what we say it will do, Return it.

THESE ARE OUR INSTRUCTIONS TO BUYERS OF THE RICHARDSON REPRESS,

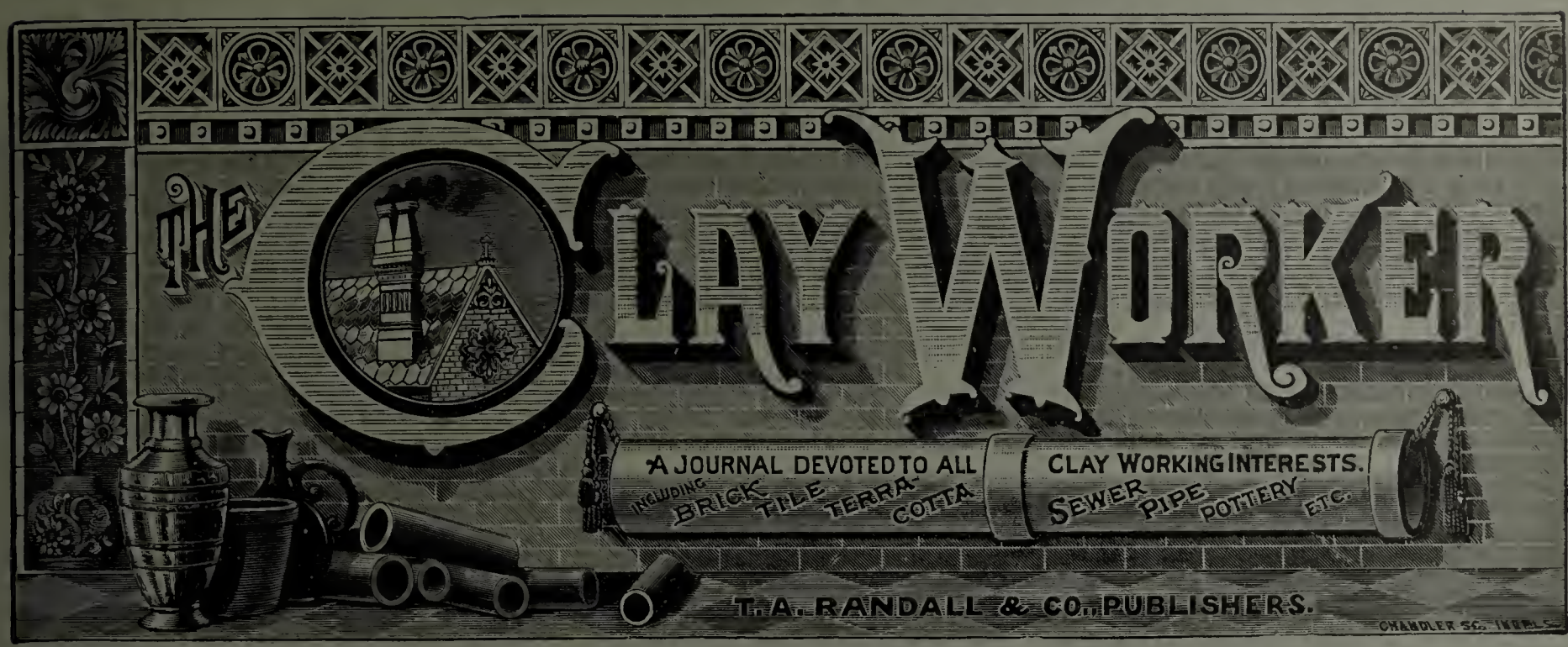
OUR LINE INCLUDES

Two sizes Power Represses.
Two sizes Hand Represses.
Also Hand Presses for Ornamental Brick.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

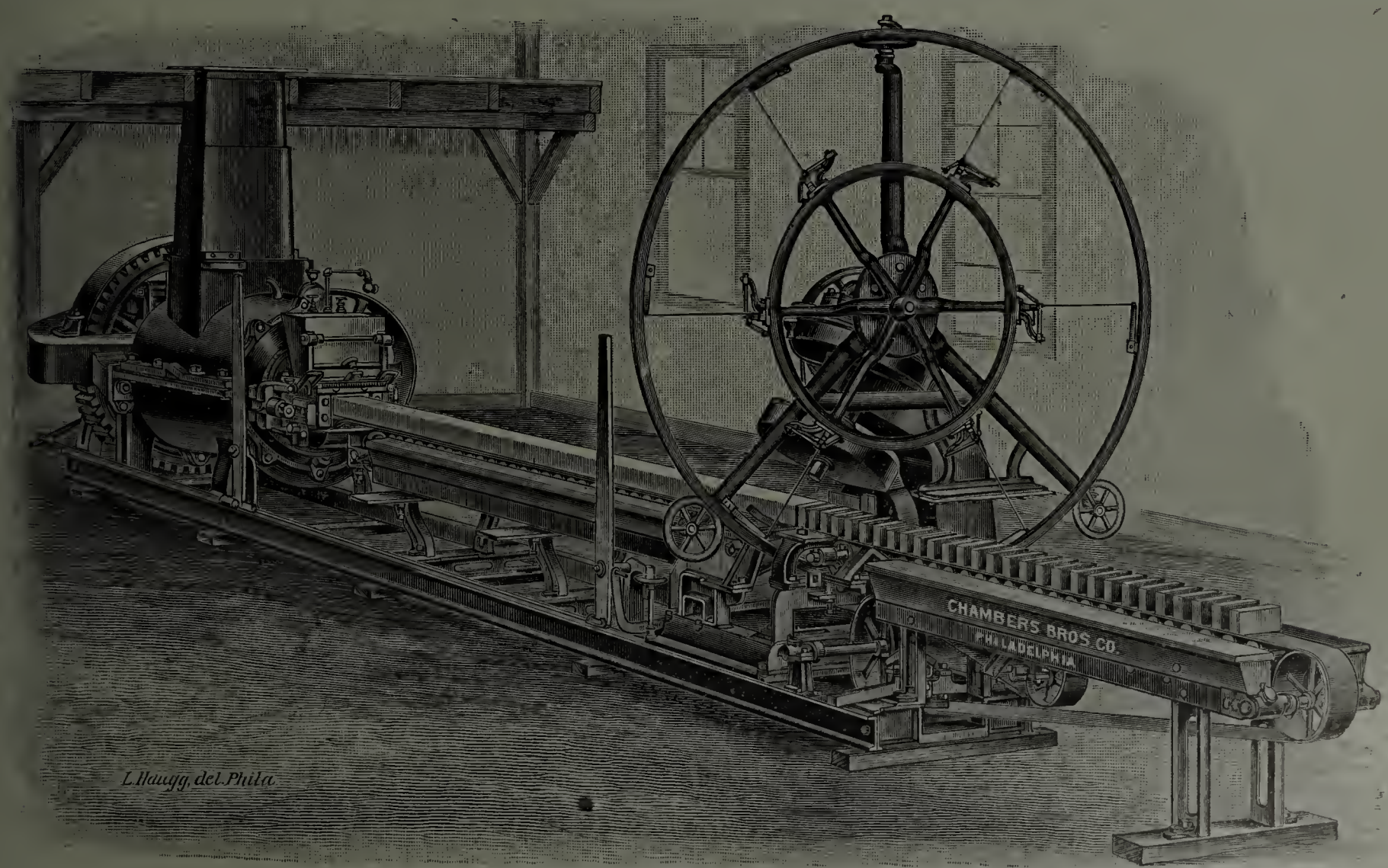
Table of Contents, Page 133.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIV, No. 2. INDIANAPOLIS, IND. AUGUST, 1900 $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

PHILADELPHIA, PA.

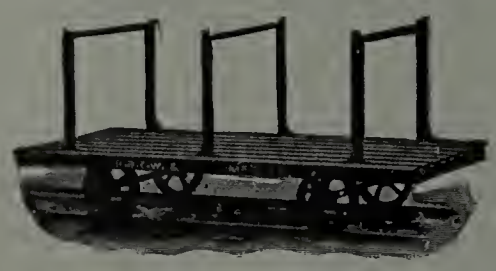
J. E. EASTES, Chicago Agent,
171 South Canal Street.

The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

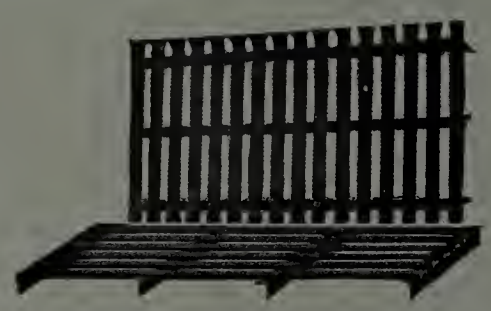
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

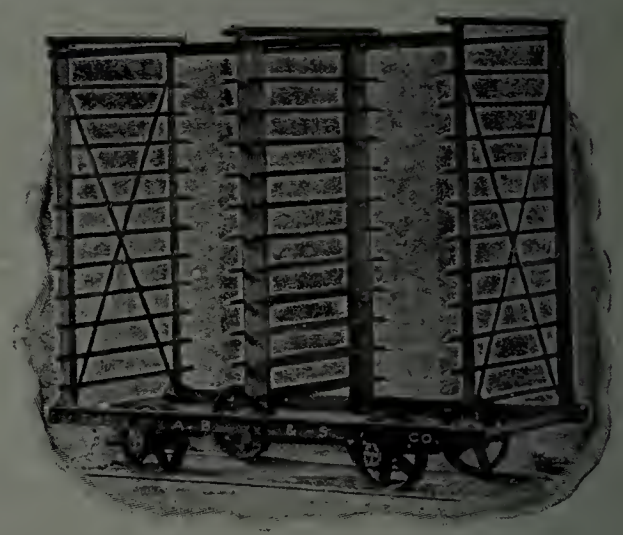
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name.	Page.
American Clay-Working Mach Co, The	Insert
Anderson Foundry and Mach. Works	88
Chicago Brick Machinery Co	89
Chisholm, Boyd & White Co	90
Fernholtz Brick Machinery Co. The	91
Progress Press Brick and Machine Co	140
Ross-Keller Brick Machine Co	..

Brick and Tile Machinery.

Adrain Brick & Tile Machine Co	65
American Clay-Working Mach Co., The	Insert
Anderson Foundry and Mach. Works	88, 155
Baird and Son, H. C	145
Battenfeld Mfg. Co, The	139
Brewer. H. & Co	159
Chambers Brothers Co	85
Chicago Brick Machinery Co	89
Eastern Machinery Co, The	166
Fate & Co., The J. D	160
Freese, E. M. & Co	164, 165
Henry Martin Brick Mach. Mfg Co, The	157
Hensley, J. W	87
Horton Mfg Co, The	161
Kells & Sons	145
Leader Mfg. Co, The	156
Madden & Co	144
Ohio Ceramic Engineering Co., The	168
Potts & Co., C. & A	162, 163
Raymond Co., The C. W	134, 135
Stedman Foundry and Machine Works	157
Steele, J. C., & Son	149
Stevenson & Co	167
Wallace Mfg. Co, The	158
Wellington Machine Co, The	137
Wiles Co., A. M. & W. H	149

Brick Kilns and Dryers.

Alsip, S. H	143
American Blower Co, The	168
Barron, A. F	152
Bushong, M. M	154
Eudaly, W. A	154
Haigh, H	152
Illinois Supply and Construction Co, The	92
Morrison & Co., R. B	141
New York Blower Co., The	142
Phillips, S. G	143
Pike, E. M	141
Reppell, L. H	152
Swift, F. E	152
Standard Dry Kiln Co, The	94
Yates, Alfred	144

Brick Yard Supplies.

Atlas Bolt & Screw Co, The	86
Arnold, D. J. C	155
Borden & Selleck Co	143
Buhl Malleable Company	144
Cleveland Car Co	153
Caldwell & Son Co., H. W	147
Carmichael, T. W	145
Carnell, Geo	149
Coldewe & Co., G	142
Cox, Geo. S	142
Elder & Dunlap	142
Frost Engine Co	93
Harrington & King Perforating Co, The	87
Henry Martin Brick Machine Mfg. Co, The	157
Horton Mfg. Co, The	161
Jeffrey Manufacturing Co, The.	147
Kendall & Flick	141
Marion Steam Shovel Co	156
Main Belting Co	141
Mershon & Co., W. B	146
Newton, A. H	147
Newton A. C	147
Phillips & McLaren	146
Rockwood Mfg. Co, The	144
Smidth & Co., F. L	148
Turner, Vaughn & Taylor Co	168
Vanduzen Co., The E. W	143
Wel's & Hall	145
Williams Patent Crusher and Pulverizer Co	91

Miscellaneous.

Burt Manufacturing Co	133
Chesapeake & Ohio R. R	145
Clinton Paving and Building Brick Co., The	151
Coaldale Brick & Tile Co., The	150
Cotton Belt Route	146
Dean Bros. Steam Pump Works	145
DeWit. H	153
Eastern Paving Brick Co	150
Engelhard, Charles	142
Evans & Co., Victor J	146
Evens & Howard	145
Gabriel & Schall	145
Green & Hunter Brick Co	150
Harper-Norton Shale Brick Co The	150
Indianapolis Engraving and Electro Co	144, 145
Indiana, Decatur & Western	146
Lake Erie & Western	146
Laughlin Mfg. Co	147
McAvoy Vitrified Brick Co	151
Miller Oil and Supply Co	143
New York Brick and Paving Co	150
Osborne, W. R	144
Outing Mfg. Co	153
Preston Brick Co	151
Pennsylvania Line	145
Purington Paving Brick Co, The	151
Sears, Roebuck & Co	144
Terre Haute Brick and Pipe Co.	151
Vandalia Line	147
Wabash Clay Co., The	151
Ads., Small Wanted, For Sale, etc.	

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

Samples or blue prints with prices furnished on request.

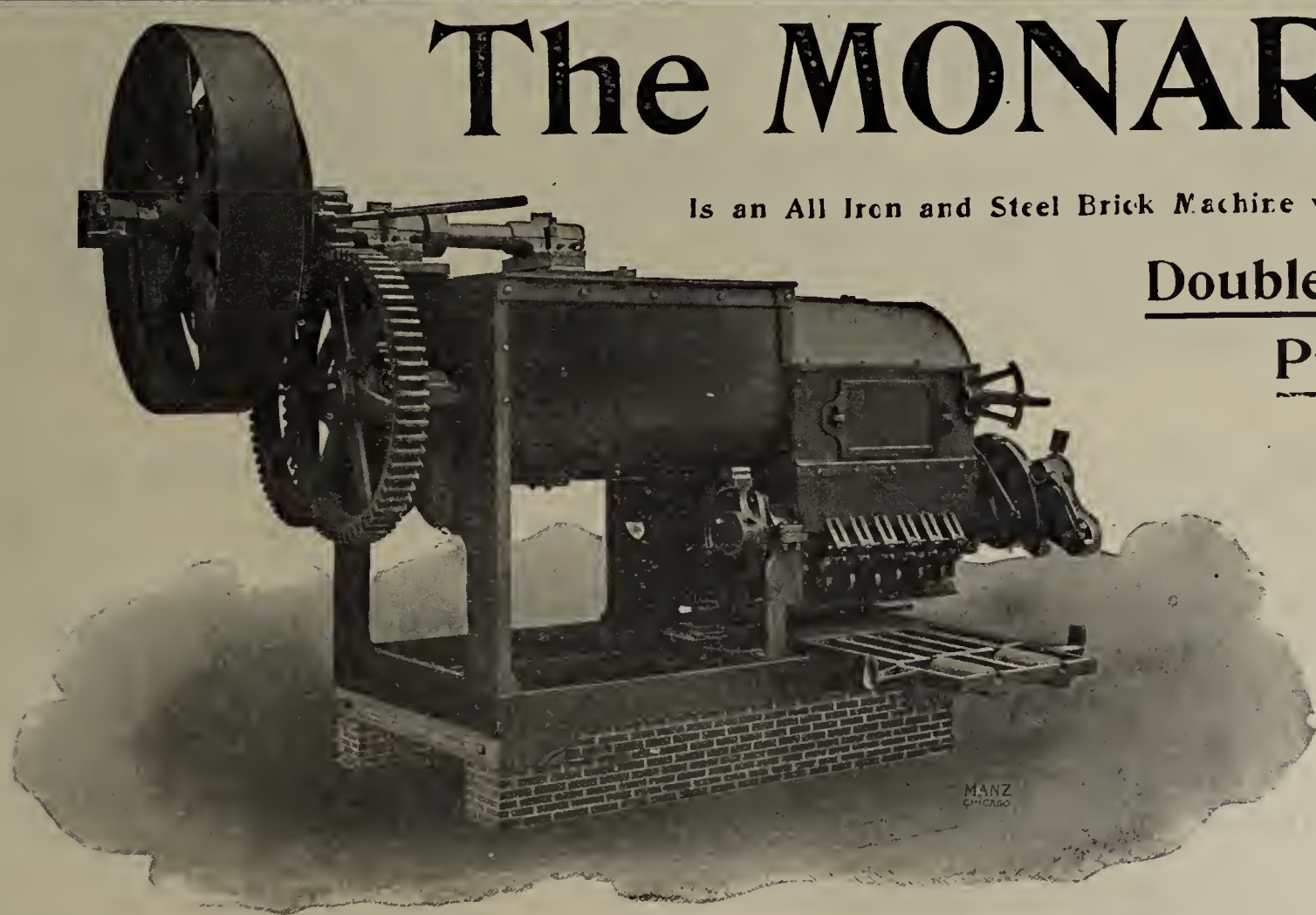
THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.

• • •



SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new IRON QUAKER. Engines and boilers. Send for new 1900 Catalogue.

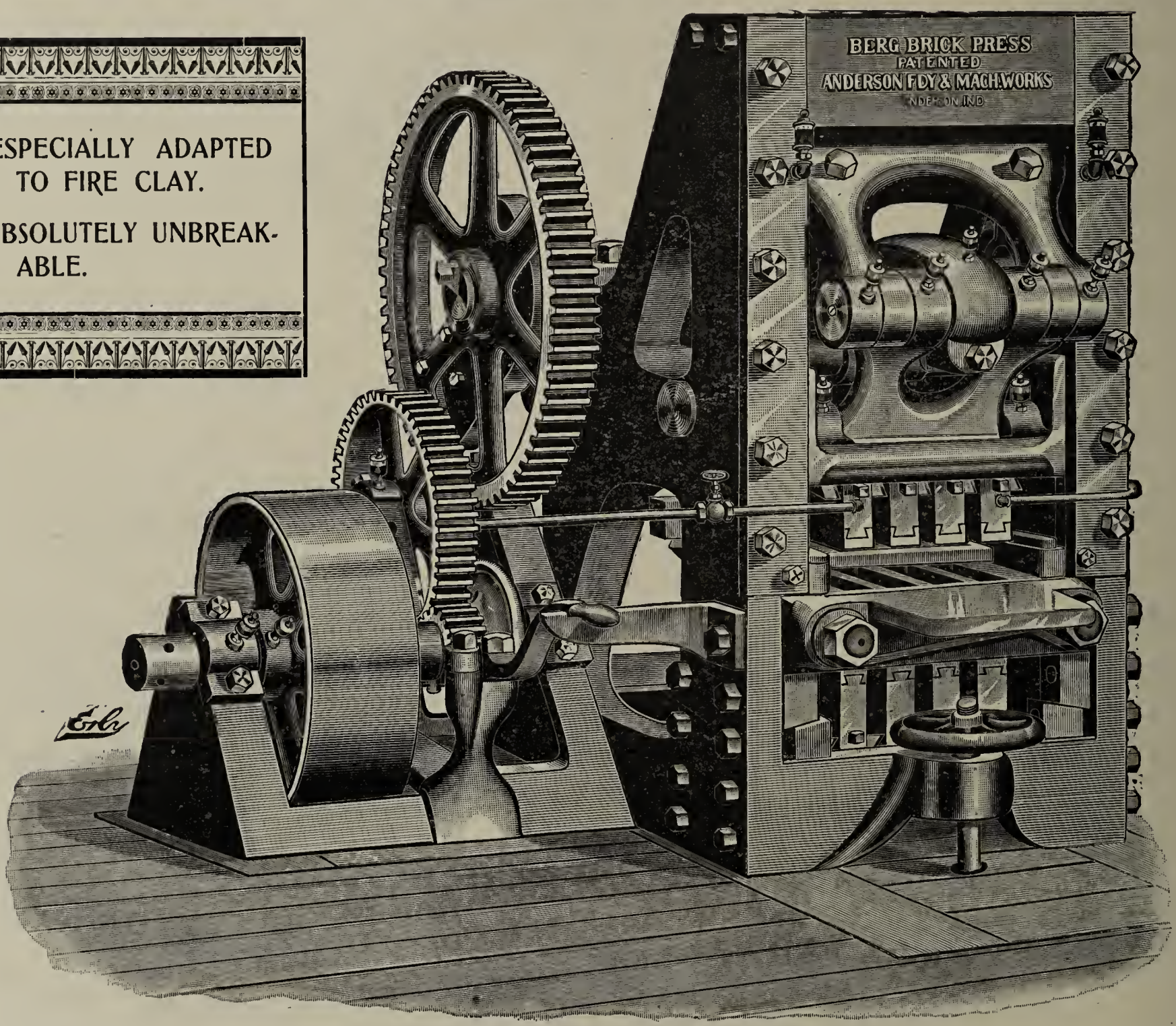
JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

WHAT IS IT?

OUR esteemed competitors protest that we do them an injustice; that there is no such thing as **"Bluff"** in their entire make-up.

Therefore it could not possibly have been a **"Bluff"** when they intimated in a recent article in the Clay-Worker (April issue) that Mr. White would tell a different story in Court than in his letter given below. But Mr. White's testimony was taken last week, and is even stronger in our favor than his letter. The United States Court moves slowly, like the mills of the gods, but it also "grinds exceeding fine."

COPY.

September 30, 1899.

John J. Moroney, 225 Dearborn Street, Chicago:

Dear Sir—I have carefully examined the Berg brick press, built by you, and have compared it with all the patents pertaining to brick presses issued to B. C. White and to J. A. Boyd and B. C. White jointly. All of the above patents are owned by the Chisholm, Boyd & White Company, and comprise the only brick press patents owned by said company up to January, 1898. The Boyd brick presses are built under these patents.

I do not find that the Berg press infringes any claim ofany of the above patents, and I see no way in which a suit against the Berg press or its builders or users could be successfully maintained by the owners of the White or Boyd & White patents.

In making this statement I take into consideration the prior state of the art, whereby a number of the claims allowed to White & Boyd and to White are limited to such an extent that they do not cover your machine.

The Boyd brick presses are all machines of my own design and invention in every important particular.

In conducting a long patent litigation involving these patents, I made a thorough examination of all patents relating to brick presses, and am therefore qualified to make the above statements without fear of succesful contradiction.

I am, yours truly,

(SIGNED) B. C. WHITE.

IT IS furthest from our intention to do our Esteemed Competitor an injustice. We simply ask every brickmaker to read carefully the above letter from the Inventor of all the Boyd Presses, remembering that it is backed up by sworn testimony; then decide for himself whether a claim of infringement is not—we will not say a "Bluff" since they object to it, but—a matter of Competition rather than Patents.

Chicago Brick Machinery Co.,

225 DEARBORN STREET.

A BIG BLUFF?
OH NO!

We claim the Berg Press does infringe our Patents. In that Press are some devices secured to us as new and original, by our Letters Patent. This is an admitted fact. Those claims in our Patents must be declared "VOID," else the makers and users of the Berg Press must be deemed guilty of infringement.

Now the fact is, we have brought suit against the Makers of the Berg Press. ═══════ **That is NO BLUFF.**

The evidence establishing our "*prima facie* case" has already been taken, ═══════ **and that is NO BLUFF.**

When the Courts have decided our patents to be "GOOD" and the Berg Press an "infringement," as we honestly believe they will, *the brickmaker* who has been talked into buying Berg's Pitman-Lever Press will then realize full well that ═══════ **we made NO BLUFF.**

If each purchaser withholds payment until this suit is decided, or takes a Bond for the money,—a Bond that is good, sure and collectible, he will make no mistake. That will be **A GOOD BLUFF,** one which the Makers and Sellers may not find agreeable "to call."

We have started out to protect what we believe to be our just and equitable rights, and we propose to fight it out on these lines ═══════ **and that is NO BLUFF.**

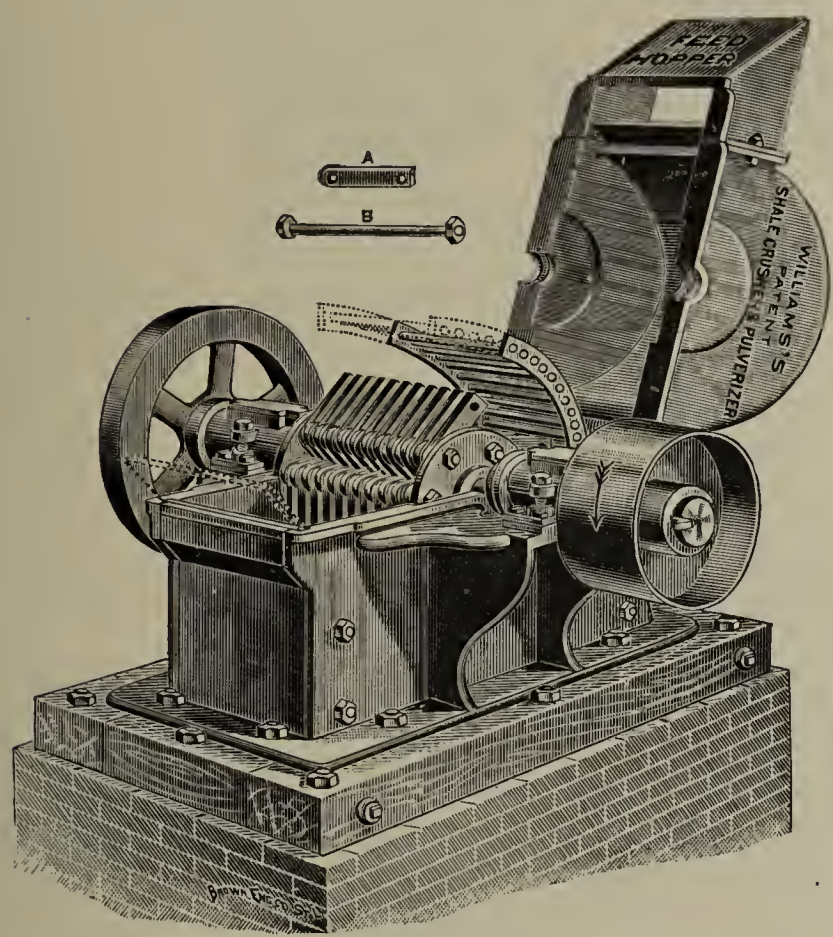
LASTLY.—We have also lately brought suit in the U. S. Court against the Sales Agents of the Berg Press, in Chicago, ═══════ **and that is NO BLUFF either.**

CHISHOLM, BOYD & WHITE CO.

July 1, 1900 CHICAGO.

The Williams Patent Crusher & Pulverizer Co.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

SUBURBAN BRICK CO.

WHEELING, W. VA., June 18, 1900.
THE WILLIAMS PATENT CRUSHER & PULVERIZER CO.,
St Louis, Mo.

Gentlemen:—Answering your favor of the 12th inst. We are pleased to say that the Shale reducing machine, put in our factory at Martins' Ferry, Ohio, has done good work, and in sufficient quantity for our needs, and has been very satisfactory in practice.

We have had no repairs or expense upon the machine, except for a set of new knives, during the past year, and this fact alone, when compared with the cost of keeping a grinding pan of the same capacity in repair, ought to be all the encomium or recommendation your machine needs to commend it to practical people.

Very truly yours,
SUBURBAN BRICK CO.,
Per B. F. Hodgman, Sec'y.

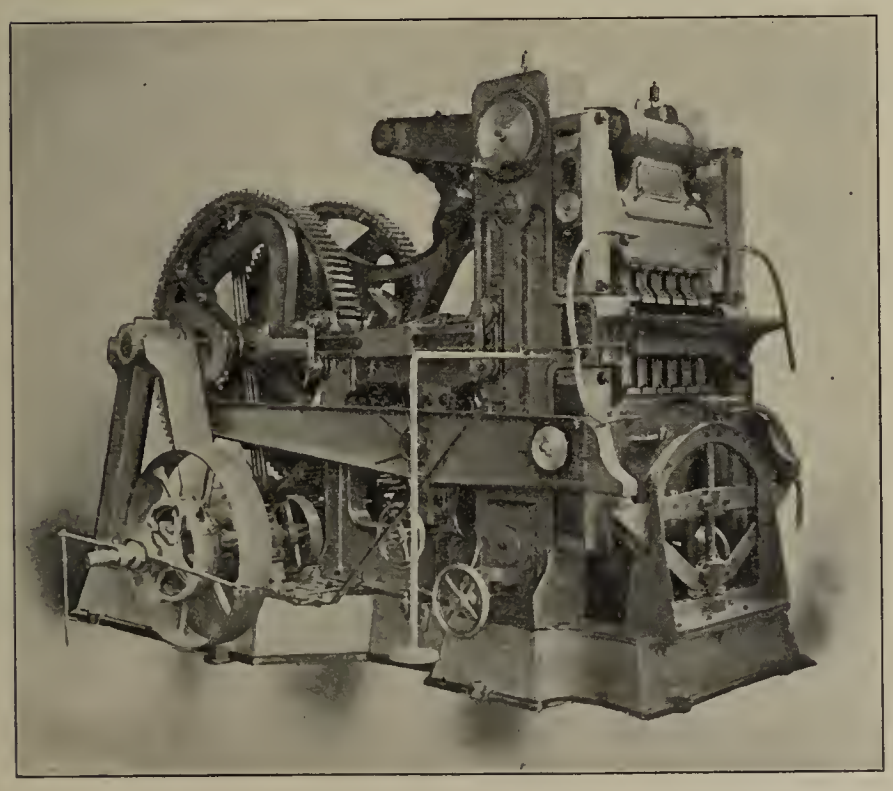
FOR FURTHER INFORMATION WRITE TO

The Williams Patent Crusher & Pulverizer Co.,
2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Singer Building.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, SIMPLICITY and SERVICE.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market.

All parts subject to strain are made of the best Bessemer steel.

Fitted with the Fernholtz Mold Box. Undoubtedly the leader.

We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer**, and the **Fernholtz Clay Mixer**, in our own factory.

Dealers in Brickyard Supplies.

PARIS, TEXAS, March 13, 1900.
THE FERNHOLTZ BRICK MACHINERY CO., St. Louis, Mo.

Gentlemen:—We are in receipt of your inquiry in regard to our Brick Machine, and in reply beg to say that we have been operating machine regularly for five years, and the repairs on same have been about $50.

We consider this a very good record and will take pleasure in recommending it to anyone who is interested in Brick Machinery.

Very truly yours.
CARTER & ROLLINS.
Per Carter.

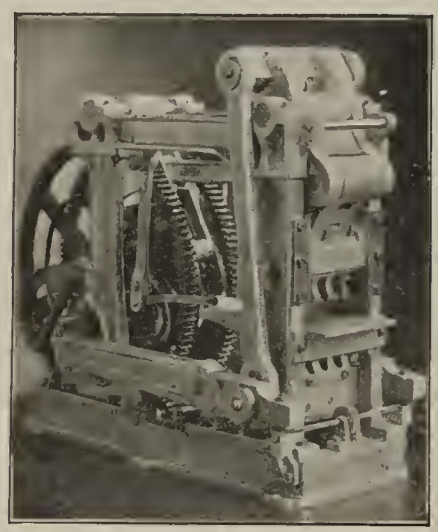
Further Information on Application.

The Fernholtz Brick Machinery Co.,

CABLE ADDRESS "FERNBRICK."
WESTERN UNION CODE.

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

Mexico Agent: INTERNATIONAL SUPPLY COMPANY, City of Mexico, Mexico.

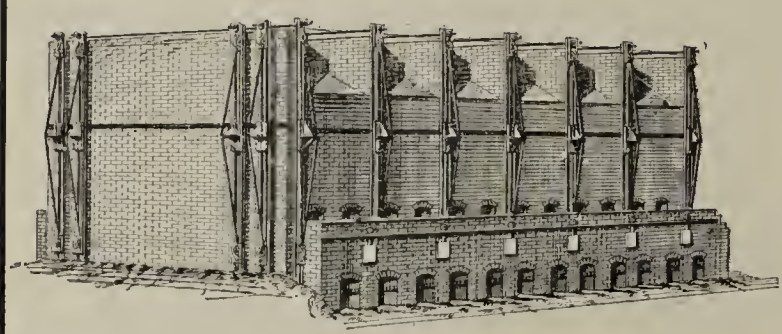


The GRATH DRY CLAY BRICK PRESS.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

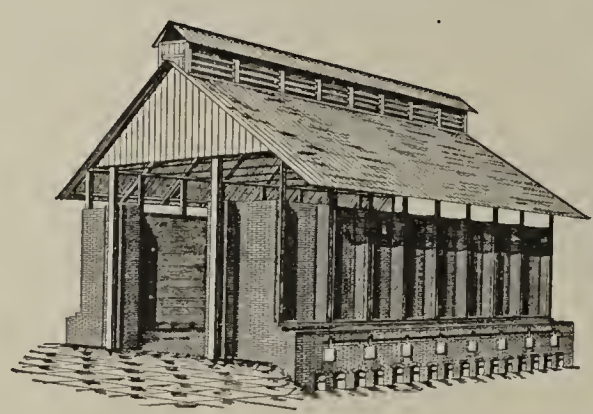
Features:

1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Requires less power to Operate.
5th. Brick free from Granulation.
6th. All Bearings Bushed.
7th. All parts Accessible.
8th. Thickness of Brick Changed without Stopping.
9th Master Wheels Close to Bearings.
10th. No Working parts under Lower Cross Head.



The GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH GRATH GAS AND COKING FURNACES ATTACHED Built Round, Square and Continuous. Perfect results guaranteed. No soft, overburned or flashed brick, uniform throughout.

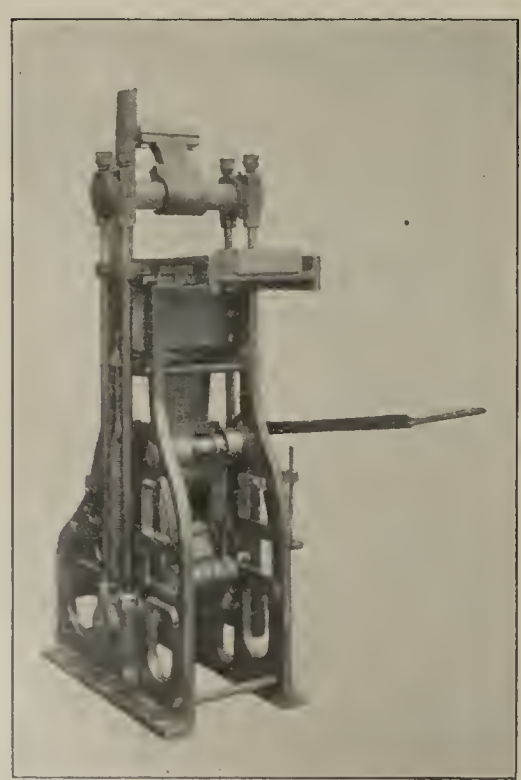


The Grath Up-Draft Kiln.

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with slack coal, with better results than lump coal in ordinary Furnaces and without any black Smoke.

The Grath Gas and Coking Furnaces

Can be attached to ALL kinds of Kilns, either old or new, and produce better results with SLACK than lump coal in ordinary furnaces. PROTECTION GUARANTEED TO ALL USERS. WILL PROSECUTE ALL INFRINGEMENTS.



The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK. The only successful Press of its kind in the market.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

The Coffeyville Vitrified Brick and Tile Co.

MANUFACTURERS OF

Repressed Vitrified Paving, Building and Face Brick and Drain Tile

Plants at Coffeyville, Cherryville and Independence, Kan. Daily Capacity 325,000

W. P. GRATH, Pres., Coffeyville, Kansas, April 30, 1900.
The ILLINOIS SUPPLY & CON. Co., ST. LOUIS, Mo.

DEAR SIR—Replying to your favor of the 24th inst., we are very much pleased to state that the Hand Power Press which we purchased from you is giving perfect satisfaction, and is making a very fine grade of ornamental brick, with less than half of the expense and more than double the capacity of the screw press.

Wishing you success in the sale of this machine, we are

Yours very truly, THE COFFEYVILLE VITRIFIED
Per W. H. MAHAN, Gen'l Mngr. BRICK & TILE CO.

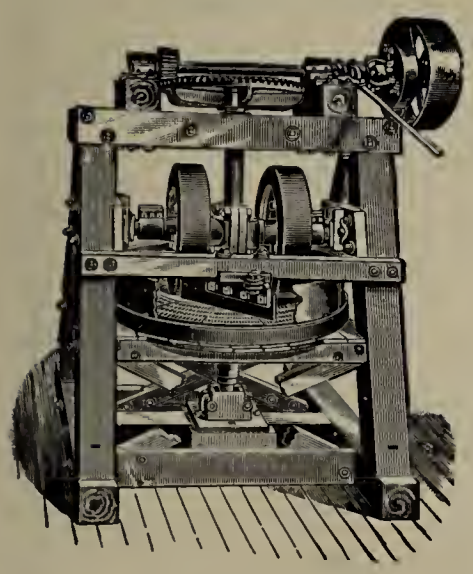
For Further Information and Catalogue on Above, address

The Illinois Supply & Construction Co., ST. LOUIS, MO., U. S. A.

Mention The CLAY-WORKER.

OUR SPECIALTY IS

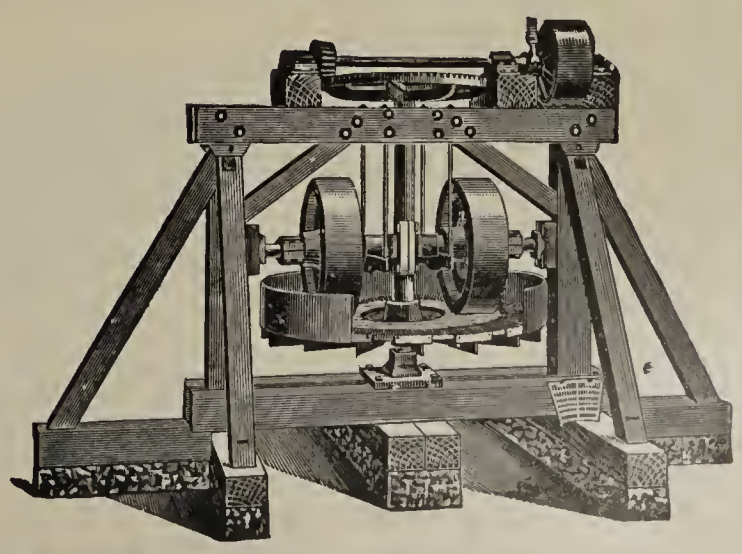
DRY PANS.



IRON FRAMES,

WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill., U. S. A.

What Brick Makers Want:

Is a Drier that will do the **best** work; do it the **quickest;** do it with the **least amount** of labor, and at a **minimum expense** for operation.

What We Want:

Is that manufacturers of Clay Products of **every kind,** examine **The Standard Drier;** investigate its possibilities, and **compare its record** with any other Drier in the World. That's all.

The Standard Brick Drier

We know, has no superior, and we doubt if it is equalled by **any other** Drier on earth. It will dry **any kind** of clay; in **any form;** do it **quickly** and **perfectly,** and at **least cost.** What more can you ask? These claims we are prepared to demonstrate to your satisfaction. Write for full particulars and testimonials.

CATALOG FOR THE ASKING.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

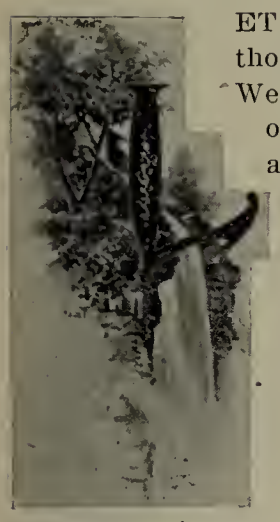
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., AUGUST, 1900. No. 2.

Written for THE CLAY-WORKER.

TILES IN NATURE.

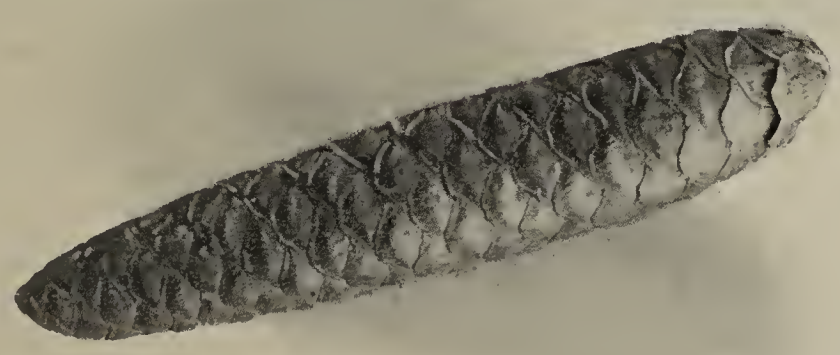
By George S. Tiffany.



LET US TAKE A short lesson from nature in those designs that are suitable for roofing tile. We shall find that she has not only anticipated our wants, but also many of our inventions and embodied them in the shells of turtles, the scales of fishes and the cones of trees so fully and clearly that if they had been in terra cotta it would have made some of our valuable patents invalid. So do our minds follow the thoughts of the Great Architect, that even in such matters we can say with the Psalmist, "There is not a thought of my heart but do, O Lord, thou knowest it altogether." 'Tis true, nature does not give us her designs in terra cotta, but did she not give us terra cotta? We certainly cannot look upon it as the invention of man. Ages before "Adam delved and Eve spun" it lay along the borders of streams of volcanic lava, and when the lightning's flash set aflame the primeval forests, in the path of the conflagration lay terra cotta, born of the earth and the spirit of fire.

It is the gift of God. It is not an invention, but a discovery. Its use among all the tribes of men, in remote parts, in which they could have had no communication with each other, as the Chinaman, the American Indian, and the Peruvians of South America, is all owing to the fact that wherever primitive man in any portion of the earth built a fire on the ground for his comfort, if the ground was of a clayey nature, the fire made terra cotta. He saw that the clayey earth was plastic, for his bare feet left their impressions thereon; he saw in his hearth that any impressions were made permanent by fire, so he made a hole in the ground, smeared the sides and bottom with clay, built a fire in it, and thus probably was formed the first hand-made terra cotta. It was a great invention for those times, for it made it possible for a man to have a boiled dinner. The next step was to make a bowl separate from the ground. Man made the clay into ribbons, wound them spirally around in the form of a bowl, and with a shell dipped in water, smoothed and shaped it to form, and baked it in a fire of buffalo chips or some fuel equally as good. The detached bowl was certainly a great improvement over the one in the ground, notwithstanding it was liable to be broken. But it is not our purpose to trace the development of pottery or terra cotta. Slowly and stupidly has man advanced in the art. Many steps forward were accidents. He has been a dull pupil of a brilliant teacher, who is still giving him lessons suitable for more advanced scholars.

Hugh Miller says, "There is scarcely an architectural ornament of the Gothic or Grecian styles which may not be found existing as fossils in the rocks," and again, "There is no form of the volute known to the architect which may not be found in the rocks, but there are many forms in the rocks unknown to the architect. We often look upon natural forms as simply expressions of beauty or utility for the purpose for which they were designed, but are slow to learn the lesson of their utility for other purposes. In illustration of this, and as a lesson from nature in roofing tile, we give a half tone of a spruce cone.



Nature's Suggestion for Interlocking Tile.

If this cone were cut across into three equal parts, and the middle section developed, it would present a very pretty design for a tile roof, having novel and valuable features. Notice the spiral lines formed by the lower edges of the lobes. Those running downward from left to right on the right side of the lobes have more than three times the pitch of those running downward from right to left on the right side of the lobes, thus forming a more direct and precipitate channel. This feature, we believe, is represented in an American patent. The idea of using cement with tiles is suggested by the gum that oozes from the stem of the cone, and, flowing down the channels, seals the joints between the lobes for a time, but when the seed is fully ripened the lobes lift like hinged doors.

and the white winged seeds beneath are caught by the winds and carried hither-and thither, "sowing the seeds of forests yet to be."

The spruce cone also presents a fine lesson in color. Along the lower edges of these lobes is a narrow strip of white, which contrasts beautifully with the dark green of the body. Green with white trimmings is but lately considered good taste in house painting. Nature is the arbitrary dictator of good taste. She established the laws of aesthetics. We can no more depart from her dictates in regard to color than we can violate the laws of harmony in regard to sound.

In the mantle of vegetation with which she has clothed the earth with beauty, there is nothing dazzling to the sight, or in the least painful to the eye. Not a single mistake has she made in the lavish use of color and their many combinations, like that of making heavy glazes for roofing tile. Even her dying colors of autumn are beautiful. A roof like the colors of the foliage of the maple tree varying from green to yellow and red would be beautiful.

There are other lessons to be learned from the cone, but we fear we will weary the reader. There are many illustrations in nature of shingle tile. We call to mind a picture of a tortoise with something like a shingle tile roof on his back, walking with head erect as if he were its original inventor. The reader will, no doubt, think of the scales of fishes; those on the tapering part of the body give a lesson in the making of tower tile.

Our faith in the resources of nature were so weak, and our ignorance so great, that we did not expect to find an interlocking tile in her great subterranean model room, and we were startled to read the following in "Testimony of the Rocks," describing a scale or plate in the covering of a fish of the old Red Sandstone:

"There ran on the upper surface of each along the interior side and higher end a groove of a depth equal to half the thickness of the scale, and along the posterior side and lower end on the under surface a sort of a beveled chamfer which fitted into the grooves of the scales immediately behind and beneath." The outline or plan of the scale is not given, but we presume is was similar in outline to the scale of a fish, the "grooves" and "chamfers" would extend along the sides of the scale to about midway of its length. This would make the interlocking features the same as on the Celadon tile, although on a tile of different form. How much is there left for human ingenuity to accomplish?

But another lesson: When the frosts of autumn touched the leaves of a bed of beets in my garden, nature showed her magic power. The stems and veins changed to a rich red, and the leaves from green to varying purple. There was a delicate rich luster covering the leaves. Surely these lusters in different colors would look fine in roofing tile. We have it in one color only, a silver gray like coke, in the "blue smoked" tiles. We want the luster in other colors.

We have mottled brick of buff color with brown spots. There is a house plant with light green lustrous leaves, flecked with small white spots. It suggests that we might have mottled work in other colors in roofing tile and in brick, especially for inside work.

Thus we have interpreted a few of the many lessons in nature relating to roofing tile. If there is anything good in this article, it is from the Great Teacher. If there is anything not good, it must be the fault of the writer.

Tile Roofed Train Shed of the Peoria and Pekin Union Railway, Peoria, Ill.

THEORY LEADS PROGRESS.

Theory is the mainspring of progress, says an exchange, and the man with the scheme, though he is often a crank and a fanatic, has a right to attention, at least to such an extent as may be required to demonstrate the practicability of his theory. But this practice is the thing that frequently knocks large chunks out of the finest theories and disfigures them to such an extent that they are scarcely recognizable. Sometimes out of a wreck of this kind a new creature of the mind is devised that does much to relieve the tedium of the work-a-day world—and, at other times, the wreck of a theory is so complete when practice is applied that not enough remains for a decent burial. Still, because a theory is lost is no reason why the mind that gave it birth should be stopped, for these are the minds that lead us into progressive ways.

ROOFING TILES.

WHAT HAS BEEN APTLY termed a "Distinct Advance" in roofing is the terra cotta roof as manufactured and adapted by the Ludowici Roofing Tile Company, of Chicago, for high-class industrial structures. We are pleased to place so interesting a departure from ordinary lines before our readers and note the gratifying advance that burned clay is making in this, as well as in other lines of building material. While terra cotta, or burned clay, has for ages led all lines in durability, its practical application to roofing is a recent accomplishment. The difference between it and all other roof coverings is simply the difference between a designed and manufactured article and a raw material. The modern interlocking terra cotta roofing tile as manufactured by the Ludowici Company is the result of years of design, experiment and use on the part of German manufacturers, who excel in knowledge of scientific principles and in their correct application to existing needs.

Most manufacturers have heretofore been content to use cheap, temporary roof covering, just getting in out of the rain, so to speak, and allowing repair and renewal bills to ultimately increase the cost of such protection from the weather most unnecessarily. Many of the better buildings of this class have been covered with slate, but this in its lack of and element of design is as truly raw material as the aborigine's bark covering for his hut.

The Ludowici Company, in offering its perfect terra cotta tile at $6.00 per square, furnishes a most valuable item in the evolution of modern building from ephemeral to permanent construction. The present proposition is steel and terra cotta vs. wood and tar, and to all who can afford the necessary initial cost to insure ultimate economy the former alternative commends itself.

Laid directly on steel purlins, without sheathing or inner roof of any kind, the Ludowici interlocking tile affords the lightest, most durable, fireproof, and withal ornamental roof that can be had. Resisting the action of all destructive vapors from locomotives, foundries and forges, which makes so short-lived slate and iron roofs, even when these are employed instead of wood and tar, its economy is apparent.

The use of glass tiles, fac-similes of the clay, and interlocking with them affords the best medium, and for the amount of light secured, the cheapest, for the transmission of light through the roof. Their corrugated surface acts prismatically and transmits many times more light than an equal area of plain glass. By their use the expense and annoyance of sky-light frames, with attendant metal flashing and inevitable leaks, are avoided, and the roof lines remain unbroken.

The accompanying cuts of the Peoria & Pekin Union railway train shed, at Peoria, Ill., illustrate this interesting use of glass and terra cotta. "Brickyard" insurance rates are notoriously high. These rates are based on a line of experience which has demonstrated the liability of such plants to conflagration. The modern clayworking plant built of steel and terra cotta, as it should be, saves all insurance, and, better still, the infinite annoyance and loss that a fire always occasions.

We are glad to bring this matter so conspicuously before the clay manufacturers as a distinct advance in construction by the use of which all may profit.

Tile Roofed Train Shed of the Peoria and Pekin Union Railway, Peoria, Ill.

CAUSE OF FIRES.

Referring to the oft-repeated statement that rats and mice gnaw matches, Edward Atkinson, president of the Boston Manufacturers' Mutual Insurance Company, says he has evidence that rats do ignite matches, while mice have not yet been induced to do so. Experiments were made extending over a period of three months by confining rats and mice singly, or several at a time. But mice have been known to carry away matches for their nests and they are fond of the vicinity of steam pipes for their nests. Mr. Atkinson advises that all possible restrictions be placed upon the use of matches in and about buildings, except safety matches, which can only be ignited by friction upon the box in which they are contained. It was found that although rats will gnaw the heads off such matches, the latter will not ignite.

J. L. SINER & SONS—TWO WELL-KEPT BRICKYARDS.

NEVER PASS Independence Hall without feeling a wave of latent enthusiasm sweep over me, leaving a thought behind that all clayworkers, brickmakers and other reputable citizens might accept and point to it with pardonable pride as being the best monument to the sturdy value of bricks and mortar as against all other materials.

Erected in 1732, after the designs and under the personal superintendence of John Hamilton, it has stood the proof against fires and tempest and destroying influences of time, a splendid attribute of the ability of the man in this city one hundred and sixty-eight years ago to make bricks the equal of those made to-day. Not as fancy perhaps, but possessing the necessary time-enduring strength and answering well the requirements of that time.

In point of harmonizing lines and details, it is architecturally the superior of that mammoth marble pile, the City Hall, in course of erection since 1874, on which the municipal authorities have expended some $21,000,000, as against the modest sum of $16,500, the cost of the original Cradle of Liberty.

It was here that the first assembly of the Continental Congress convened, in May, 1775, and in the same month the immortal Washington accepted his appointment, made by special act of Congress, as general of the Continental army.

The Cradle of Liberty.

On July 4, 1776, the glorious old bell, with its deep-throated reverberation, rang out the signal preceding the reading of the welcome passages of the Declaration of Independence. Two years later, on the 9th day of July, the articles of confederation and perpetual union between the States were signed and adopted here.

Our illustration shows Independence Hall as it stands to-day, remodeled in all its lines according to the original plans, this has been carefully carried out by the architect appointed by the city, T. Mellon Rogers, at a cost of $25,000. An edifice bearing all the good traits of our forefathers, modest, stanch and true, a Mecca for all tourists and a model to which all clayworkers should turn whenever they enter the city of Brotherly Love.

Boarding the car at Fifth and Chestnut streets, where the east wing of the hall terminates, I determined on visiting the yards of

—Joseph L. Siner, at Kensington avenue, Frankford.—

Improvements and new dwellings marked my line of progress on every side. At Germantown avenue and Fifth street I could see the flames from the forges and heard the tap, tap of the hammers at the Philadelphia Brick Machine Works, of

—George Carnell,—

thus proving business was in full swing.

As the car swung into Frankford my eyes focused the torn-up condition of North G street, and stacked on the sidewalk were the double-head Western brick, ready for setting. This will need a closer inspection later on.

Coal to Burn—Siner Bros. Brickyard.

Dropping off, I made my way into what is here locally termed the "Summer Yard," under the management of C. B. Siner, who quits his work to extend the hand of welcome and to show me around.

In reply as to business conditions, etc., he said: "While the present outlook is not particularly favorable, we are more than gratified by the extent of business done last year. Many mills and dwellings were erected, calling for hard brick, and from the 1st of April good prices were maintained. In fact, we got fifty cents per thousand more for brick than we did in the early part of the season. All through the year we had good burns, and succeeded in turning out twelve million bricks for the season. So we were financially successful, quitting away ahead of the two previous seasons. Since your last visit we have shaped up around here and fixed a new pug mill up behind the machine."

The Martin machine, in use since 1882, still knocks off its 30,000 daily, none the worse for its eighteenth birthday. The four twelve-arch Dutch kilns have been renovated, and the drying racks look spick, span and new.

"My father would have been pleased to have met you; he is at present at Atlantic City, enjoying the ozone from the grand old ocean, and there I join him from Saturday to Monday."

Mr. Joseph L. Siner, whose photo. is here given, has been patting the earth on the back for forty-five years. In other words, he, in company with his brother, Charles B. Siner, started making bricks, at Second and Berks streets, in 1855, backed by the experience given them by their father, John A. Siner, who started and maintained a plant at Fifth and Columbia avenue and later at Third and Columbia avenue. He is in all sincerity one of our best and well-known pioneer brickmakers, willing and ready at all times to give a good brick for good money and to keep up the price, rather than shave it.

Hard, machine stretcher and a good paving brick has kept up the reputation of this particular yard for twenty-four years.

Parting from C. B. Siner with a hearty kommen sie wieder, I hastened across the meadows,

—"Where the Kine Were Lowing,"—

intent on getting a snap shot at the other yard before the sun went down.

This is located at Harrowgate and Nicetown lanes. Unfortunately, I missed Horace M. Siner, brother to C. B., and who has the control of this yard.

The lay-out of the yard is very similar to the other, except they use the fan dryer. Some forty hands are kept during the season, and last year nearly 16,000,000 brick were turned out.

—Prospects For the Fall Season—

point to a return of activity. Many plans are being held in abeyance by the architect, whose clients, eager to escape from the broiling process of this summer's high temperature, have hied them away to cooler regions.

The municipal authorities have taken up the contracts for $324,400 worth of new sewer work, and already contracts have been given out for $150,000, being for fifty-seven of this type of sewer termed branches. LOCKINGTON.

WRITTEN FOR THE CLAY-WORKER.

BUTTON-HOLE TALKS.

"DID YOU EVER THINK, Gates, how awfully helpless a great big, full-grown man is, anyway? He may be muscular and quick motioned, robust and healthy. May, in fact, be healthy, wealthy and wise, but he is helpless, nevertheless. Sometimes I think the stronger he is, the bigger he is, the richer he is, the wiser he is, the more abject and pronounced is his helplessness.

"Hold on; don't ask questions. You will only waste time and make unnecessary muss and delay. I will explain fully.

"Awhile ago my wife went away on a visit and I was left forlorn and desolate all by my lonesome self. While I was in this condition, alone in a desolate and echoing house, I noted the arrival of Nat Goodwin at the theater. Of course, I couldn't resist. Possibly I might have fought it off if he had been alone, but when Maxine Elliott was with him I just couldn't stay away. Well, I went down and bought my lone ticket—going early so as to get a good seat. When I went in the usher led me to a prominent seat, next to the end seat in the row. The end seat was already occupied by a young woman quite gorgeously arrayed, though I did not notice the loudness of her apparel so much at first as I did later on. Shortly after I had taken my seat three more couples filed in and were evidently a theater party. Gradually it dawned on me that myself and the lady next me might well be taken to be of their party, but the curtains going up, I became oblivious to all but the play and the actors. Presently Goodwin made a good hit, when the lone lady in the loud apparel, at my side, let out a long, happy, rippling laugh of appreciation that traveled out over the house in such a glad, unconventional way that it gathered in the attention of the whole house. I felt sorry because I wanted Goodwin to have the attention of the audience, though I wouldn't have minded having this picture at my side having her share. I didn't begrudge her, mind, but when she had attracted all this attention it seemed someway to slip past her and linger with me, as if I were responsible for her. So much was this the case that I could feel, even on the back of my head, the earnest glances, the concentrated attention, I was getting as her supposed escort. There was nothing for me to do, nothing I could do, but sink down, as low as possible, in my seat, hoping to appear as little as I felt, and thus escape attention until the actors could again win back the attention of the audience.

"Presently Maxine Elliott made a good hit, and from my side there emanated a snicker which hurried out and took the house, making her former laugh appear weak and sickly in comparison. Again the attention of the house was concentrated upon us. She, now vigorously chewing gum and happily chasing the snicker with a basketful of giggles. Me, helpless object, shattered and shrunken until my clothes wrinkled. From time to time, while wriggling about trying to sink lower in my seat, I caught reproachful glances from staid old neighbors of mine, in the audience, who knew of my wife's absence,

Joseph L. Siner, Philadelphia.

and I realized that the reputation of a lifetime was gone and that no explanations would be listened to or entertained.

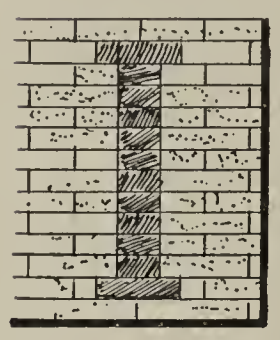
"The actors struggled nobly, but they could only win the attention of the audience by fits and starts. Little bunches of attention, as it were. We had the big bunch. The bright being at my side chewed on industriously and giggled and snickered in her own glad, impulsive, unrestrained way, and when the performance closed it left a wrecked and helpless man on whom his friends looked, not with suspicion, but with confirmed assurance that he was a reprobate and hypocrite. Every effort to explain only deepened their conviction of his culpability and depravity. Don't talk to me of the helplessness of frail woman. It's your big man who is helpless, and the bigger the man the more helpless. GATES."

The man who said the successful business man of the day, no matter what his line, is the thinker, the one who is willing to admit he doesn't know it all, but that there are still some things for him to learn, hit the nail squarely on the head.—Exchange.

Written for THE CLAY-WORKER.

VITRIFIED BRICK PAVEMENT IN PHILADELPHIA.

Harrison Souder, Civil Engineer.



IN TAKING UP the story of brick pavements in Philadelphia, a short history of the movement for improved pavements will give a better understanding of the situation. The use of improved street paving in this city really dates from 1884. Up to that time the majority of the streets were paved with rubble and cobble stones, and with the exception of a few squares of granite blocks occasionlly, cobble paving continued to be laid. It was continually being relaid, too, as the writer well remembers, and Philadelphia was famous for its ill-paved, rough and noisy streets.

Agitation for improved pavements culminated in 1884, in an ordinance of Councils directing the Mayor to appoint a board of three expert engineers to study the paving of Philadelphia and to report on the same. They were "to point out defects" of the present system and to "specify what, in the opinion of said engineers, was the best system of pavements for Philadelphia, due regard being paid to durability, economy, smoothness, cleanliness and freedom from noise."

Three eminent engineers, Messrs. Gillmore, Greene and North, were appointed. In their report they recommended that no more cobble or rubble pavement be laid under any circumstances, and that all then laid be replaced by an improved form of paving and that in the future all pavements should be either of granite blocks, sheet asphalt or asphalt blocks. They estimated that to give Philadelphia improved pavements would cost $22,355,000 to be spent in ten years.

The condition of the streets at that time is shown by the following tables:

Year, 1884.	Miles.
Paved streets	573
Macadamized streets	44
Unpaved streets	443
Total	1,060

The paved streets were classified into—

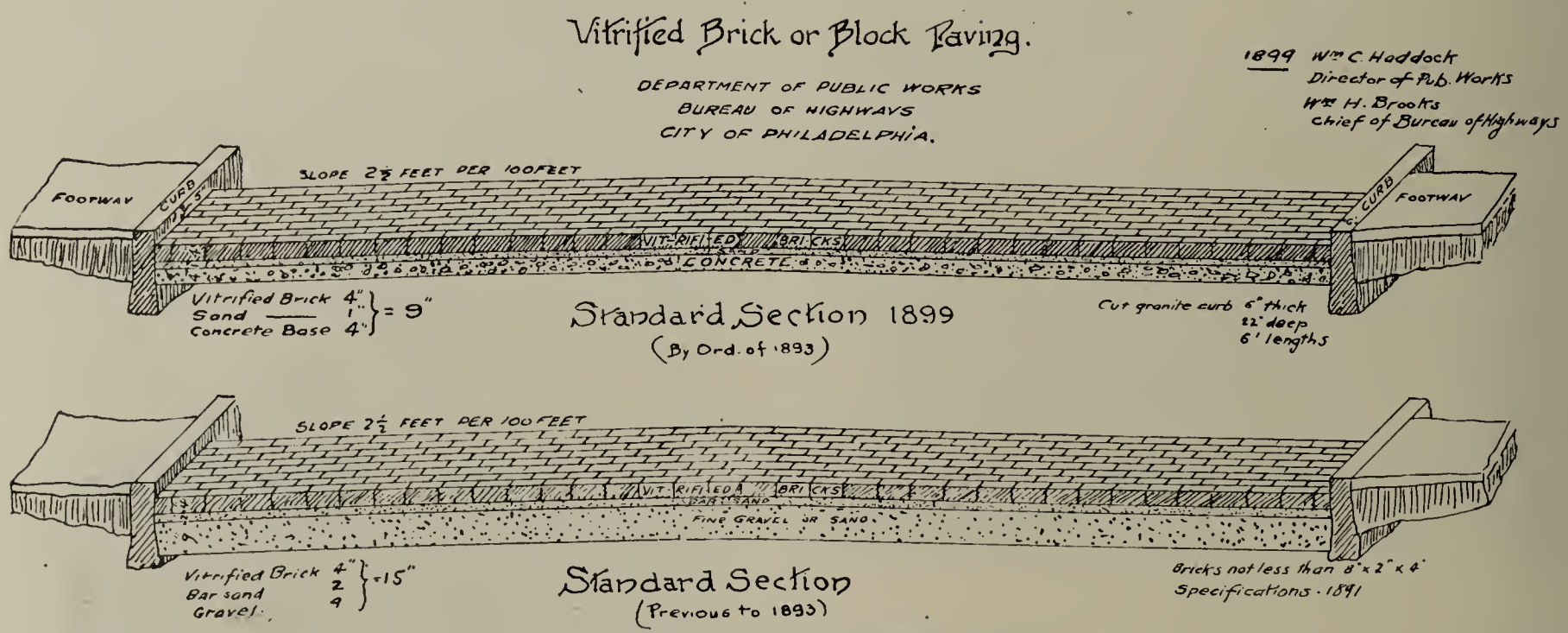
	Square yds.	Pct.
Cobble and rubble	9,113,925	93
Granite blocks	654,148	6 2-3
Asphalt	25,396	1-3
Totals	9,793,469	100

The report rendered by these experts was excellent in many respects and gave a definite basis on which the authorities could proceed, and since that time the work of laying pavements has steadily continued on nearly the same lines as laid down in the report.

One notes in the report, however, two things, viz.: The absence of mention of vitrified brick, and the recommending of asphalt block for street paving. This seems unaccountable, because brick as a material for street paving was used in Charlestown, W. Va., as early as 1870, and with success. It was used in Holland for the same purpose at even an earlier date, whereas asphalt block, so far as the writer knows, was a comparatively unknown quantity in 1884.

Asphalt block, when first laid, makes a beautifully smooth street surface, but a few years' trial in Philadelphia proved its unfitness for the work.

After 1884 each administration endeavored to outdo the preceeding in laying improved pavements, but the work was greatly retarded by legal considerations. The franchises of the street car companies in Philadelphia require the companies to keep in repair the paving between curbs on all streets occupied by their tracks. There are few streets in this city that are free of car tracks. The authorities insisted that the car companies should lay improved pavements, and the companies refused. The city paved some of these streets, and carried the matter of payment into the courts and won. It was not until 1892, however, that car companies started to do any paving, but since that time they have improved many miles of streets.



The early chiefs of the Highway Bureau invariably recommended granite block paving, that being the form of improved pavement they were most familiar with. It was in 1887 that vitrified brick was first used as a paving material in our streets. In that year a total of 12,041 square yards, or about 0.75 of a mile, was laid out of a total of 10.2 miles of new paving. The merits of brick paving were apparently immediately recognized, for in 1888 there were laid 5 miles, out of a total of 28.8 miles; in 1889, 5 miles; in 1890, 9 miles.

In the annual report for 1889 the Chief of the Bureau of Highways says of paving block: "As to the smoothness, cleanliness, noiselessness, ease of repair and also presenting a non-slipping surface for both horse and vehicle, there is no doubt of its merits." He complained, however, that some of the first pavements were showing signs of wear. This early sign of wear was due to several causes, the most important being (1) insufficient or poor foundation, (2) many underburned or bricks of poor quality.

From 1889 on, the use of brick increased rapidly, the proper qualities for a good brick were better known, more intelligent

inspection was given to selection and laying, and consequently better results were obtained.

In 1893 Councils passed an ordinance requiring all improved pavements to be laid on concrete foundation. This was a great step in the direction of good, permanent paving and gave a new phase to the possibilities of brick as a street surface.

Previous to this the foundation was composed of nine inches of coarse sand with two inches of bar sand on top, 15 per cent. of loam, or mud-making material, being allowed in coarse gravel in the earliest specifications. As laid, this did not give a firm enough foundation.

At first sand only was brushed into the joints, then pitch was tried, but worked out into the gutters. Cement grout, poured into the joints for a width of from two to four feet from each curb, was next tried, with good results. The ordinance of 1893 required four inches of hydraulic cement concrete base, with a cushion of one inch of bar sand under vitrified brick, and all joints grouted with cement grout. This is still the practice, and gives excellent results. Figs. 1 and 2 show present and former methods of laying brick in Philadelphia.

Fig. 3. Darby Road at 71st Street, Philadelphia.

In 1893 the Chief of the Bureau reported that the brick pavements were wearing fairly well. In that year about ten miles of brick pavement were laid, requiring over 9,500,000 bricks, mostly from West Virginia. Philadelphia then had more miles of brick pavement than any other city in the country, the total reaching 49.6 miles, equal to 5.8 per cent. of all the paving in the city.

With the improved foundations and improved quality of material furnished, vitrified brick paving has continued to hold the good-will of the authorities and the public. It was at first used only on residence streets, but has since been laid on heavily traveled highways with good results.

Photo. Fig 3 shows the excellent condition of the straight edge West Virginia paving brick laid in Darby road or Woodland avenue, at Seventy-first street, the main artery of Southwest Philadelphia. This paving has been down ten years and the repairs practically nil. The travel on this street is heavy.

The writer lately made a personal examination of brick paving laid in 1889 on sand foundation, and found all the small and some of the larger residential streets to be in splendid condition.

Photo of Springfield avenue, at Forty-eighth street, Fig. 4, shows the excellent condition of one of the largest of these streets. Paved with West Virginia bricks in 1889, and never repaired, some of these streets, where the travel has been fairly heavy, were considerably worn and had been repaired in spots, but as a rule the pavement is yet in fair condition.

Unfortunately for improved pavements of all kinds, Philadelphia has had a trying experience. In the last two years the streets have been constantly torn up and trenched, to allow the laying of innumerable pipes, wires, conduits, etc., and once a street surface is broken it can never be patched up to equal its original condition. To give an idea to what extent the streets have been broken it will suffice to mention that in 1898 one company alone took out permits for opening 50,000 ditches, aggregating 117 miles in length.

To Be Continued.

CARELESSNESS CAUSES MUCH LOSS.

The American Miller doesn't take much stock in the "incendiary" origin of fires in manufacturing establishments. No one will deny, it says, that there are fire bugs; that malicious persons sometimes burn an enemy's mill or property in revenge for real or fancied injuries. Nor is there a doubt that the pipe of the tramp causes occasional fires. But it is hardly fair to assume a human agency in the case of every mysterious fire, simply because the mill was not running. A record of curious but actually ascertained causes of fires would go far to dispel the idea that in cases when the mill is not running some person must willfully or carelessly apply the match. First of all, spontaneous combustion is no myth, though perhaps too many fires are ascribed to it. Oily waste or heaps of fermenting material are well-known causes of spontaneous fires. Rats and mice love phosphorus, and the nibbling of the end of a match has caused fires. The rays of the sun focused through a defect in a pane of glass caused a series of mysterious fires until the cause was ascertained and removed. Sparks from locomotives and chimneys are a more prolific cause of fires than many imagine. Fire, it must be remembered, may smolder for days and weeks before bursting into flame. Many mill fires break out from one to ten hours after mill has shut down. It is well known that hot bearings have caused such fires, discovered after the mill was shut down, but before the mill was in flames. It is only fair to credit up a portion of the alleged incendiary fires to this cause. We believe that as time goes by the tendency to ascribe mysterious fires to human agency will decrease, as the real causes become known. The chief human agency is carelessness, not malice.

Fig. 4. Springfield Ave. at 48th Street, Philadelphia.

A LITTLE CLIPPING ON PATIENCE.

For the best results there needs be the longest waiting. The true harvest is the longest in being reached. The failures come first, the success last. The unsatisfactory is generally soonest seen.—Ad Sense.

WRITTEN FOR THE CLAY-WORKER.

A BRICKMAN ON HIS RAMBLES.

By B. W. Blair.

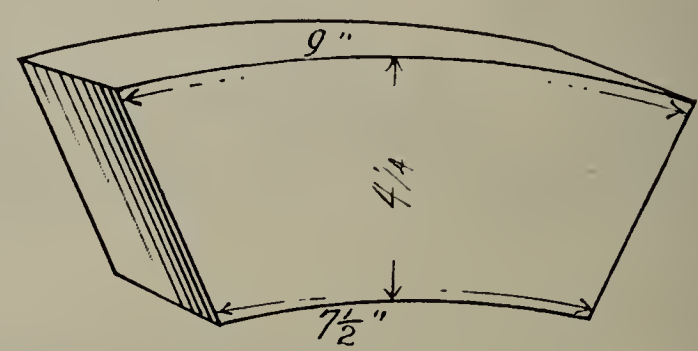
IT HAS BEEN TEN YEARS since the writer made a tour of the various paving brick factories of the West. About that time marked the beginning of the paving brick industry. From the very inception of the industry success was promised, but the rapid strides it has made in ten years has surprised even its most ardent supporters. Having some leisure during the past few weeks, we again traversed the ground traveled by us ten years ago, and were surprised at the development of the vitrified or paving brick interests. We found perfection had almost been attained in the machinery part of the manufacture, and in burning the product rapid strides have been made that assures the permanency of the paving brick industry. We found brick paving more and more coming into use, and that vitrified paving brick were supplanting stone in foundation and culvert work and asphalt in street paving. The ornamental sidewalk pavers are rapidly taking the place of the concrete walk, being more pleasing to the eye and durable than the old concrete walk, with its monotonous dull gray color. We predict in the future this branch of the brick industry will develop many artistic designs and colors in sidewalk tile. Many of the railroads now pave their walks and passenger entrances to trains with brick. This was particularly noticeable of the Burlington route. The brick for this purpose will last not only for "an age, but all time." Leaving Cincinnati in the afternoon, evening found us in Terre Haute, Ind., where the manufacture of paving brick has assumed goodly proportions, and the laying of paving brick or the construction of their streets has reached perfection. Mr. W. P. Blair piloted us to his works and through the city, pointing out the various streets and the durability of vitrified brick for street paving. Mr. Blair is an enthusiastic stickler for brick for streets and the proper construction of roadways. He has so recently expressed his views at the N. B. M. A. convention at Detroit that it would be superfluous to dwell more on this phase of the work in this article. We can only bear witness that we saw streets that had been laid five, seven and even nine years that looked as if they had just been put down and smooth as a board. It was noticeable in places where brick and asphalt joined, in alternate lengths of each, how much more durable and smoother the brick streets were. The filler of one part Portland cement and one part sand makes the pavement perfectly level and lasting, and prevents any chipping of the edges of the brick.

—At Brazil, Ind.—

Upon Mr. Blair's earnest solicitation we journeyed to Brazil, Indiana, where are located many clay industries, and were shown through the works of the Indiana Paving Brick and Block Co. by the manager, Mr. Thomas Proud, where they are making a 3¼-inch block, and burned hard from side to side and top to bottom of kiln. Here we noticed perfection in the burning of kilns, using care and caution in that important part of the manufacture, and with the results above mentioned. We were struck with what has been advocated by all good burners, slowness in water smoking, gradually bringing heat to the settling point, allowing the material to absorb the heat and then settle gradually and with care after heat is through to the bottom of the kiln. If these cardinal points in burning are observed, then one cannot fail to produce a merchantable article. It requires good judgment, care, and watchfulness for a brick burner, and then sufficient time for the cooling or annealing of the wares.

The next works visited were those of the Barr Brick Co., at Streator, Ill. This admirable paving brick plant is under the management of the veteran, J. M. Bushong, which is a guarantee that all is well done. Mr. J. M. Bushong has had a long and valuable experience in burning brick. He was the friend and early projector, and aided in the development of the clamp kiln for burning brick with coal in permanent furnaces and walls with hot air chamber. I refer to the kiln invented by Mr. E. V. Wingard, of Pennsylvania. We remember the time when it was said that "a kiln could not be burned with coal." To have seen Mr. Bushong return a kiln of building brick, the latter all reset Salmon brick, and the result of that burn was 90 per cent. hard brick. Mr. Bushong was among the first to burn vitrified paving brick, at Galesburg, Ill., and to his efforts much is due for the success or bring into notice that locality.

We noticed one feature at these works: They have firebrick blocks which they lay dry and form the bag walls of thier kilns. The blocks are 9 inches long on outer circle by 7½ inches in inner circle, and are 4½ inches wide, and about 4½ inches thick, thus:



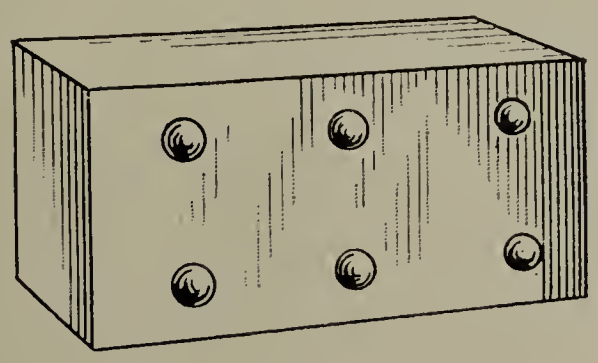
They build these bags of about 7½ inches of above blocks at bottom and slightly tapering towards the top. They have sixteen round down-draft kilns here, and have recently erected a M. M. Bushong square down-draft kiln, and it has given good results. Mr. Barr, the proprietor of the works, treated us with courtesy that is so general among all members of the N. B. M. A. Here, as all through Indiana and Illinois, they burn without grate bars.

—At Galesburg, Ill.—

We next journeyed to Galesburg, Ill., where we spent several days in profitably inspecting what is the largest paving brick plant in the world: While our former president, of the N. B. M. A., D. V. Purington, was the president of this company, the works were built, and are under the able management of his brother, Mr. W. S. Purington. The latter is what Carlyle has designated one of the "Captains of Industry." Mr. W. S. Purington has not only displayed much executive ability in the management of these works, but has shown much ingenuity in their construction, which amounts to genius. Here we find everything neat and clean and "everything in its place, and a place for everything" the latter motto of one of our most successful manufacturers of machinery. This neatness of the sheds and houses around the brick works struck us very favorably, as it inspires the workmen with a desire to be careful and neat in the handling of the wares they manufacture. They also have here their machine shops, with lathes and machines to cut off bars of iron as if so much wood; their store rooms with fittings and tools and a list hanging at the door, where every tool and fitting can be found in its appropriately numbered place; a carpenter shop, where they manufacture their own wheelbarrows, for they make all their own iron and wooden wheelbarrows. As we said before, everywhere is neatness, their engine rooms models of cleanliness and paved smoothly with their own manufacture of superior paving brick. It is a beautiful sight as you approach the plant to view the kilns, 27 in number, and the works stretching for over half a mile in length. You see over 12 of the kilns, a huge black tube, six feet in diameter and extending 550 feet long. It looks like a

big mastodonic blacksnake resting upon the top of the kilns. It is the apparatus for conveying the waste heat from cooling kilns to utilize in driving the moisture from the newly molded brick, thus saving much expense heretofore encountered by the company in drying brick. It is needless to say it works well, as its designer, Mr. W. S. Purington, had charge of its construction. Indeed, as I said before, everything is mastodonic here, from those huge leviathans of the clay bank —three great steam shovels, with their ponderous trunks cutting or eating up the banks of shale—to the immense piles of manufactured brick piled for future delivery. We saw one pile of brick, which is but a small proportion of many, in which were stacked 600,000 paving brick. These brick all conform in shape and hardness; it seemed as if a large order was needed this was the place to get it filled. They not only make a specialty of brick for paving, but also manufacture a brick for street purposes. They also produce a sidewalk brick, as do nearly all the factories we visited. We believe one great secret of success of this concern commences at their bank, where they are careful in selecting only the proper material to make their brick and not mixing with deleterious substances simply because they will fuse or burn readily. They go to great expense to properly strip their bank in order to obtain the proper material.

They are making a paving block having six very slight buttons or raises upon the broad side, so as to form a crevice for a joint of cement when laid in the street. This we thought a good idea, as it allowed room for the cement to percolate, thus:



The buttons are a thirty-second of an inch or less in thickness. We were struck with the uinformity of their product and the very able management of its production. Their works and twenty-seven kilns, with its annual production of considerably over 50,000,000 annually, requires great executive ability and much capital in its management. We could fill many pages in a description of these works and the many points we learned in the manufacture of paving brick, but space will not allow. They ship some days 300,000 to 500,000.

They are making a specialty of a very durable and beautiful brick for fronts, called the "continental brick." They are very hard and look well in a building when laid with white or red mortar, the contrast of mortar with the bluish brown color of the brick producing a beautiful effect. These brick will last as long as granite. The company is erecting out of them a very beautiful office building adjoining their works, where every comfort for the housing of their clerical force to perform their duties will be provided, even to a kitchen for cooking the savory dishes of the menu for the good of the inner man. The writer had the pleasure of partaking of their hospitality at one of their noonday banquets. Order, system and good will to their men is the actuating motive of the employer, and respect of the employes for the proprietors is evidenced on all sides. It is a noticeable feature to strangers visiting any of the Purington factories with what devotion and respect the workmen speak of the owners. This augurs well for the cause of capital and labor and solves that much-mooted question. As we said above, there is order, system and cleanliness about the concern. They have daily reports and records made of the burning of their kilns, of the setting and making of their brick, and also of the necessary repairs to kilns and machinery. This part of the business enables them each to keep exact tab of their expense account.

—At Des Moines, Iowa.—

We with regret bid adieu to Mr. Will Purington, the able manager, and sped on towards Des Moines, Ia., our first visit to this State so renowned for its rich soil and large corn and prohibition proclivities. Here we found everything brick or burned clay, culverts, bridge piers and the ballasting on railroads. Des Moines has several prosperous paving brick plants and gives employment to many men in that industry. The Iowa Brick Co. were remodeling their entire plant, repairing machinery and putting in a modified form of the Haigh system of utilizing the waste heat from cooling kilns to dry the brick instead of using steam dryers. They promise after they start to do a good business and make many brick.

The Capital City Brick Co., under the direction of J. B. McGorish, president, have a continuous kiln and Eudaly kilns and Fate machine. They make paving and building brick. In addition to their brick works, they do contracting business, building the brickwork in Des Moines. They produce a good article and are busy. The Flint Brick Co., William L. Bracht, manager, have a model works of about fifty daily capacity, and are doing a fine business. Here, as at Galesburg, we found fine results, everything in order, and a perfect system. From machine to repress, then to kiln and burning is all well done. They commence at the very beginning, and in their shale bank use care in the proper selection of material and see that the shale is properly stripped and same kind of material enters into all the brick in like proportions all through the kiln. They have a fine steam dryer. But in burning their product exhibit the most skill and same painstaking care they do in selection of shale. They have five Eudaly kilns and they are giving fine results. Their brick are not overburned, and stick together as we so often see with paving brick. They are all burned hard as flint and not out of shape. Consequently the kilns are not racked to pieces and melted. It is no exaggeration to say that as present constituted we saw here the most perfect results in burning and handling of fires. There is a good trade in the product of this company, and they deserve it for the care they take in manufacture and the excellence of results.

—At the Windy City.—

On our return trip we stopped in Chicago and found the thirty-five brick works there had formed themselves into one company, called the Illinois Brick Company. We found our ex-president of the N. B. M. A., D. V. Purington, the vice president, and one of the moving and leading spirits in the new organization. His works at Blue Island had temporarily suspended operations, but his genial and accommodating manager, George H. Drew, showed us through, and interested us in his description of the various points and manner of conducting business. It would take too much space and time to elaborate upon their perfection.

—At Detroit, Mich.—

At Michigan's metropolis we found the evil effects of a diversity of interests. The combine had dissolved in March, and brick had gone as low as $4.50, delivered at the building. Verily, in "Union there is strength." The F. H. Wolf Brick Company, one of the most progressive firms in the business, were making extensive alterations. They had put in a new Standard steam dryer, Martin soft mud machine, and Chambers stiff clay machine, steam shovel and other improvements, and were doing a good business.

We returned to Cincinnati much benefited by our trip, and had learned many new ideas in brick manufacture, and awed with the marvelous expansion of the brick industry and the evidences of prosperity everywhere manifest. Much of this growth is due to the timely organization of the National Brick Manufacturers' Association, and the lessons therein learned, and we were proud we were a charter member of that worthy organization and in fraternal touch with its estimable members. The brick is the thing in which we see the prosperity of the people.

Written for THE CLAY-WORKER.

THE BRICK BUSINESS IN NEW ENGLAND.

ON THE SUPPOSITION that there must be items of information to be gleaned from some of the brickmakers of New England, and which might be of interest to readers of The Clay-Worker, we started out a day or two ago on an inquisitorial and inspective tour, and give below a rambling report of the results of our inquiries and observations.

What with having eaten a hearty breakfast and starting out under bright, but cool skies, we were prepared to take an optimistic view of everything in general and the brick business in particular.

Before it was late in the day, however, we had listened to a number of tales of woe, covering poor demand for brick, badly burned kilns and worthless workmen, which had cast a pessimistic blur over things and made us feel that even in the brick business one must expect some rainy days and a few carloads of bats.

—Boston.—

This being a small village near the "jumping-off place" in the East, and with only a local reputation, anyway, we feel that we are safe in giving a digest of what we learned in that place, without being called down a little later for "talking through our hats," or of what we knew nothing about, or of reporting the condition of the "chestnut crop."

As we look at the brick business, it has three principal features, and which are: Production, output and outlook.

—Production.—

In the yards depending principally upon the Boston market, and which make only the ordinary building and sewer brick, we found them—or, at least, most of them—running nearly to the limit of their capacity.

Since the burning of Fiske & Co.'s brick works, last fall, the manufacture of face and ornamental brick has been greatly reduced. Nearly all colored brick are now imported from New Jersey and other States.

—Output.—

This being the dullest part of the midsummer season, it is, perhaps, but natural that the deliveries from the kilns are not equaling the number of brick being delivered to the same, and hence stocks are accumulating more or less on different yards. The different works of Parry Bros., on account of some heavy contracts which they are filling, are an exception to the rule, but most of the brickmakers are not mourning as much over not delivering the desired quantity as they are over the very low price obtained for those which they do deliver.

Six dollars for all hard brick and $5.00 for salmon brick at the kilns may net a living to the manufacturer whose works are located in the coal fields and where labor is very cheap, but we doubt whether the average brickmaker can house his family in an $1,800 a year flat or take in the Paris Exposition on the profits obtained at such figures.

—Outlook.—

The number of projected buildings of the better class in contemplation of erection the coming fall and winter do not at present seem to reach the average at this time of the year. This seems to be especially true in the smaller cities, but which are contiguous to the Boston market, and which buy their brick of such representative firms as Fiske & Co. Doubtless the condition of the building trade is due to the higher prices for material, which have prevailed of late, and as brick have at no time enjoyed advanced prices commensurate with other material, and also from the fact that the prospects for a large output are fast receding daily, and that for smaller profits is approaching hourly, it is not much to be wondered at that the average brickmaker about Boston is catching at straws to which to cling and sail to better times.

Just at present the one great hope of the Boston brick men is the Brick Trust, and which is to absorb most of the yards competing in this market. The first effort in this direction was found faulty, and had to be abandoned, but it was a case of "try, try again," and now we understand that the bonds have been placed. It is only a case of hoisting the sale of perfected organization and starting for the port of prosperity.

By and by there will be a return journey and heavy cargo, and will the ship come in laden with golden brick or worthless bats. Ah, well, this may be one of the cases where it may be a good thing to have the strong faith of the Christian Scientists, and let us believe that while the ordinary manufacturing trust is not the kind and combination of mortals "which goeth forth and weepeth, bearing precious seed," that in this particular case it will be one of the kind which return again rejoicing and bringing their sheaves with them.

When we started on this article we intended to cover quite a good deal of New England, or at least its markets, but it is probable that if any reader has continued along this far, that he is as anxious to find the end of the article as we are to get at the beginning of our dinner, and, therefore, we will cut it off right here and maybe pick up the balance of the sheet later.

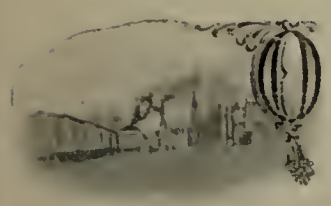
J. A. S.

Works and Workmen at the Clinton (Ind.) Building & Paving Brick Co. (1) A Gang of Wheelers. (2) Mr. Robb and Supt. Adams. (3) The Setting Crew

WRITTEN FOR THE CLAY-WORKER.

BRICKMAKING IN HOOSIERDOM.

A Combined Building and Paving Brick Plant.



N ONE'S FIRST VISIT to Clinton he must certainly be impressed with the busy appearance of not only the town, but the country surrounding it. In the business center all is hustle, while from the surrounding hills rise many columns of smoke, each indicating the location of a coal mine or other industry, including the object of my visit, the Clinton (Ind.) Paving and Building Brick Company.

First proceeding to the city office of the above-mentioned concern, I was greeted by the manager's son, Mr. M. V. Robb, who has charge of the office work, and by whom I was entertained until the arrival of Mr. J. W. Robb, the secretary and manager. Mr. Robb's horse appeared shortly and we were off to the yards, which are about one and one-half miles from the center of the city.

During our drive I was informed that the company was organized in 1892, through the efforts of Mr. Robb and other local investors, all of whom could see no reason why a paving-brick plant would not be a paying investment when raw material and fuel were abundant and with a direct railroad line to Chicago. Many different shales were tested before the ground which the plant now occupies was leased.

—At the Brick Works.—

Arriving at the works, we were greeted by Superintendent O. S. Adams, a man who is well known to many of the Eastern readers, he having left the Mack Manufacturing Company about three years ago to "go West and grow up." In order to view the plant in a systematic way, our first tour was of the shale pits, two in number, and located about 150 and 400 yards from the main building and known as Nos. 1 and 2, respectively. In the first one a vein of blue argillaceous shale is worked to a depth of about twenty feet. It is very soft and contains less silica than ordinarily used in the manufacture of pavers, consequently it cannot be used alone, as was originally intended.

In shale pit No. 2 a vein of grayish shale, more silicious than the first, is worked to a depth of about ten feet. Both shales are overlain by a strata of soil and uncertain clays, ranging in depth from two to six feet. To the two shales, of which equal parts are used, is added about 8 per cent. of yellow, plastic clay, which is obtained on the yard, but a few yards from the buildings. With this mixture they have, as a neat folder puts it, "a mixture which vitrifies thoroughly, makes a tough and compact brick and is neither brittle nor glassy."

—Getting In and Preparing the Clay.—

The shale is blasted and loaded in cars, which have a capacity of about one and one-half cubic yards each and which are hauled to the building from pit No. 1 by winding drum, and from pit No. 2, the greater part of the way, by mules, then by drum. On reaching the building it is dumped into one of two chutes, according to its kind. These chutes lead directly into the dry pan, and by a number of gates, all of which system shows the hand of Mr. Robb, one man is enabled to feed a dry pan with two kinds of shale fast enough to make 40,000 brick per day. The arrangement not only saves the labor of a number of men, but also insures a more nearly perfect mixture of the materials.

From the Penfield dry pan, the ground material is elevated to a revolving screen, thence passing to Penfield pug mill and on to brick machine of same make. A Bonnot automatic cutting table is in use, cutting at each time fourteen block and two brick. The finishing touches are put on the block by two Columbian special represses. The brick are not repressed, but are set in the bottoms of the kilns and other places where the heat is not sufficient for burning No. 1 pavers and, being good, hard brick, are easily sold for building purposes.

Glimpse of the Clinton Building & Paving Brick Co's Works. (1) The Row of Kilns. (2) Feeding Clay to the Dry Pan. (3) View from the Clay Pit

—Clay for a Rainy Day.—

On one side of the machinery building is a large clay house, capable of holding enough material for about two weeks' run, while on the other side of the building are the boiler and engine-rooms, in which are two Atlas boilers and an engine of the same make. There is also a machine shop, substantially built of brick, where, by doing their own repair work, they save hundreds of dollars each year.

Two Iron Clad dryers, of five tracks each, next attracted our attention. I was informed that the frame work in the dryers, which supports the tracks, had been a cause of great annoyance, and to do away with this brick walls have been built in one section of the dryers, and on these walls the tracks now rest. The other sections of the dryer will be arranged in the same way next year, since it is believed that better results are obtained with the same amount of heat, aside from the fact that they now have little or no trouble with the tracks.

—How the Brick Are Burned.—

Our next investigation was of the row of six square Eudaly

kilns, on one side of which was the transfer track and on the other side the switch. In these kilns, also, I found another innovation, in the shape of solid bottoms, and one which my hosts have designed. In these kilns, only over the flues are openings found, these made by the floor tile which are ordinarily used in the entire floor. Each of the kilns has a capacity of about 125,000 brick. Bituminous coal is used in burning and also in water-smoking, and about ten days is the time required, while eight or nine are allowed in which to cool.

The chief product is the well-known Clinton block, which is 3½ by 4 by 9 inches and weighs 9½ pounds. Some sidewalk brick are made, though Mr. Robb informed me that only early and late in the season did they turn their attention to this class of business. The sidewalks are 2½ by 4¼ by 8½ inches, and weigh 7½ pounds.

About seventy men are employed at the works, while ten or twelve more are constantly engaged in mining and transporting the coal used, which is obtained from a small mine about

Clinton Paving & Building Brick Co.

House Foreman's Daily Report Clinton, Ind., ... 189

NO CARS OF SHALE HOISTED .....

" " " CLAY DUMPED .....

" " BRICK MADE { BLOCK / STANDARD / REPRESSED

HOURS MACHINERY RUN .....

MEN EMPLOYED .....

CARS COAL UNLOADED — TONS

" WAGONS " " — TONS

CAUSE OF DELAYS .....

MISCELLANEOUS .....

GOODS OR REPAIRS RECEIVED .....

..... Foreman.

Half Size.

a mile from the works. The contract for furnishing the shale is let to one man, who receives so much per thousand. The setting is also done in this way. All employes are paid each alternate Thursday, not one refusing to sign the petition which is required under the new Indiana law.

A strict account of everything done is kept by means of reports, which are turned in daily by the house and yard foreman, while there are also records of the burning of each kiln. This close painstaking attention to little details is indicative of the thought and care given to every feature of the business, the natural result of which is to be seen in the character of the product. Wherever introduced Clinton block and brick grow in popular favor, and the business methods of the company are such and the personality of Mr. Robb is so pleasing that they retain the good-will of every patron and acquaintance.

A. HOOSIER.

Philosophy of Business.

To attend to business in business hours; to have a good word for everybody; to turn nobody down; to enjoy life as it comes along; to save up a little for a rainy day; to live well and to dress well; to own a good horse; to read good books and see good plays; a vacation in the summer, untiring energy in the winter; never to forget that money is not a means, but an end; to work while one has a zest, but when age comes on and work becomes tiresome to retire gracefully from the stage and give the younger blood a show. This is my philosophy of business.—Ad Sense.

Written for The Clay-Worker.

FRIT KILNS.

THE MANY DEFECTS of making frits, as outlined in our first paper, were put together, and when worked out and studied we obtained ideas which are, therefore, based upon technical facts. These improvements are, however, subjected to criticism.

In order to put these improvements in working order, we have to construct a stationary frit basin, which could be heated continuously. The basin must have an opening at the top to admit the frit ingredients, and another opening on the

Clinton Paving & Building Brick Co.

Yard Foreman's Daily Report. Clinton, Ind., ... 189

NO CARS OF..... SET IN KILN NO.....

" " " " " " " " .....

NO. NO. 1 ..... TAKEN FROM KILN NO .....

" " 2 " " " " " .....

" CULLS " " " " .....

" NO 1 " " " " " .....

" " 2 " " " " " .....

" CULLS " " " " " .....

TONS OF COAL USED AT KILN NO.....

" " " " " " " .....

MEN WHEELING BRICK.....

" REPAIRING .....

" BURNING .....

NO OF HOURS WORKED .....

CAUSE OF DELAYS.....

MISCELLANEOUS .....

GOODS OR REPAIRS RECEIVED .....

..... Foreman.

Half Size.

side or the bottom of the basin to draw off the frit after the ingredients are melted into a glass. Further, a basin with water.

A frit kiln so constructed would have all the necessary features to work right. Now, let us see to what extent the different systems in existence are in harmony with the above points.

The frit kilns, of which we will give a short description, are the most popular and best-adopted systems in use in France and Germany.

They are nearly all built on the same principle, and do their work to good satisfaction.

First, we have the flat-bottom kiln, from which the molted glass is drawn off by means of iron bars, which are put in a basin containing water to chill. This process is similar to glass-blowing.

Second, we have the V shaped bottom, with sloping sides; at the lowest point is an opening which is closed with a stop. This stop is removed when the frit in the melting pot is ready to be drawn off.

Third, we have the combination of the two first ones, which

consists in two sloping flat bottoms, at an incline of about 30 degrees. This system of frit kiln is mostly employed. The frit is charged on the top of the kiln. The firebox is in front, and the flame passed on the bottom of the frit tank. When the frit kiln is charged the frit remains in the tank till the same is all molted, and then the stopper is removed and the molted mass is run into a tank with water.

Lastly, we have, for experimental purposes, color frit sand for small amounts of frits, the so-called crucible frit kilns.

The crucible frit kilns, as the name already indicates, is a crucible in which the frit is melted. The crucible has a hole in the bottom, through which the molted mass drops into a bucket or other basin filled with water.

The fact has been established that we are getting better glazes from frit kilns than from frits which are fritted in saggers. The live, as we called it, remains in the frit when fritted in a frit kiln. The frit is not exposed to a long duration of the fire, and nothing has time to volatilize.

We are aware that frit kilns have been tried before in this country in several places, but without any success whatever. This was totally due to inexperience, lack of knowledge of the process of fritting, and, therefore, cannot be considered as being an actual test. In very few clayworking establishments we find frit kilns, but where we find them their use is very much appreciated.

Frit kilns should be built from the best fire clay materials to be had, as a rule they do not need much repairing; they are easy to handle, easy to clean, they are always ready for use, and are the greatest saving which possibly could be introduced in our pottery industries at the present time. The capacity of the frit kilns varies with the size and the necessities of the pottery, but 1,000 pounds of frit for a ten-hours' run is a fair-sized frit kiln.

In conclusion, we would like to make a suggestion which, perhaps, may bear fruit, and which would be considered as a great improvement and benefit for the clayworking industries in general. The weighing, mixing and firing of frits takes time and is in itself a great labor, which requires technical knowledge. Why do not some parties combine and make it their business to make frits and supply the trade with ready-ground frits of some standard quality. We wish to impress upon our readers that there is room for a frit manufacturing concern.

In these days, when glazes and bodies are no longer the secrets of individuals, but the results of scientific work, we could very well buy our glazes and frits, and mix them after standard formulae. The clay manufacturers would be highly benefited by the same, and we would advance one more step on the road of improvement.

We have supply factories and stores for nearly everything used in the clayworking line, but, as far as we know, we do not find "The American Glaze and Frit Manufacturing and Supply Company."

PHILADELPHIA'S PAVEMENTS.

One Respect in Which Proportionately It Is Ahead of New York.

It has long been the boast of the city of Philadelphia that it possessed more than a thousand miles of paved streets, a distinction of considerable importance when it is considered that the much greater city of New York has only 400 miles of paved streets in Manhattan, 140 miles in the borough of The Bronx and 522 miles, including 240 miles of cobblestone pavement, in the borough of Brooklyn, a total of 1,165 miles.

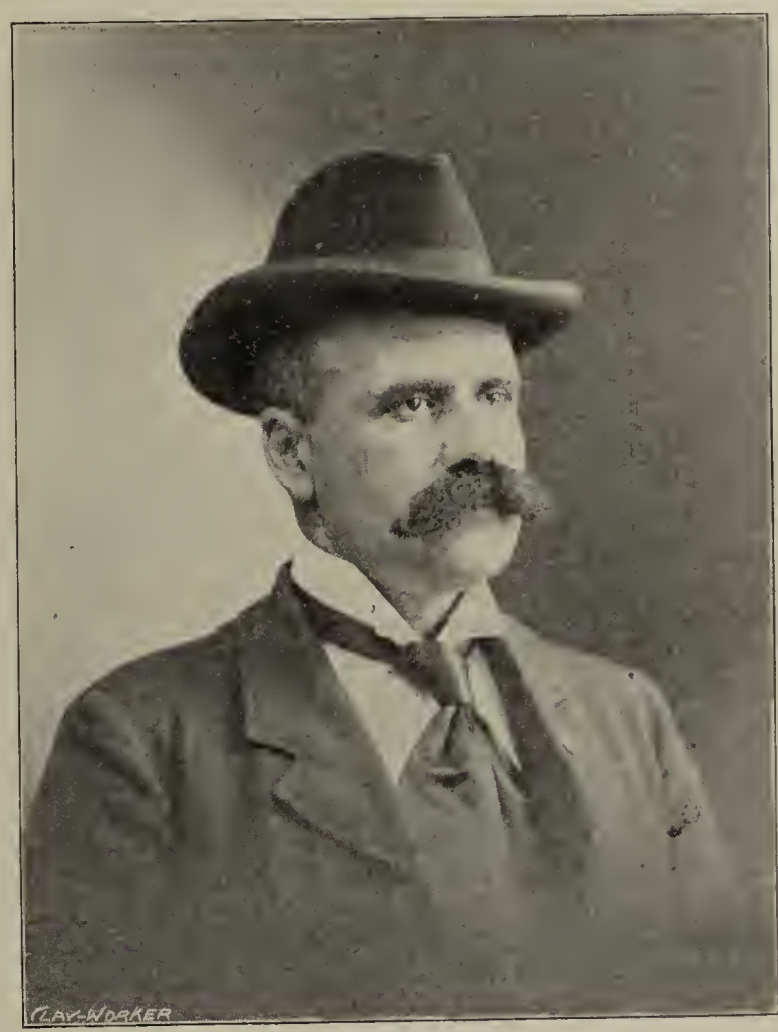
Chicago has 1,150 miles of paved streets; St. Louis, 450; Boston, 370; Baltimore, 400; Detroit, 330; Pittsburg, 200; San Francisco, 200; New Orleans, 200; Washington, 250, and Buffalo, 350.

Recently there became available in Philadelphia the sum of $1,250,000 for repaving. From July 4 until Dec. 1, 46 miles of streets were repaved, and during the same period more than 500,000 square yards of old cobblestone pavements and rubble or broken stone pavements were removed and replaced with sheet asphalt, slag blocks—a Philadelphia favorite—granite and vitrified brick.

Philadelphia owes most of its progress in municipal matters to the influence exercised upon its affairs by visitors from other towns. The Grand Army encampment of 1899 in Philadelphia brought into that city many visitors from other towns, and called particular attention to the inadequacy of the pavements in many streets. The June convention of 1900 in Philadelphia drew to that city the representative of all parts of the country, and to the wish of loyal Philadelphians to forestall their probable criticism of the cobblestone and rubble pavements is ascribed the speed with which new pavements have been laid. The city of Philadelphia has 1,500 miles of streets, of which practically 500 miles are unpaved. Baltimore has 100 miles of unpaved streets, Boston a like number, St. Louis 450, San Francisco a like number, Louisville 130, Cleveland 400 and Detroit 150. In the proportion to its area of paved streets, Pittsburg, Philadelphia's Pennsylvania rival, has less unpaved streets than any other city in the country.—New York Sun.

THE RIGHT MAN IN THE RIGHT PLACE.

A WELL DESERVED promotion is that accorded H. L. Hix by the Wallace Manufacturing Company, of Frankfort, Ind., who have chosen him to succeed Mr. W. R. Cunningham as superintendent and general manager of their



HOWARD L. HIX, Gen'l Mgr. Wallace Mfg. Co., Frankfort, Ind.

business. Mr. Hix is exceptionally well equipped for the position, having been connected with the company for two years past as traveling salesman, in which capacity he has familiarized himself thoroughly with the Wonder machinery. He knows well its merits and adaptability to various clays from having observed its operation in all sorts of material and under varying conditions. Having been a tile and brickmaker for a number of years, Mr. Hix is possessed of practical experience, that will prove of much value to him in his new position. Mr. Hix has an exceptionally pleasing personality, being genial and companionable, but at the same time modest in demeanor. His chief characteristic is what is ofttimes denoted as "good horse sense," a quality that in itself augers well for the continued success of the Wonder machinery, which we are confident will grow in popularity under his management.

Written for THE CLAY-WORKER.

THE BRICKMAKER IS MADE, NOT BORN.

By L. C. Moore.

"THIS YOUNG MAN has been with us for seven years, and has passed through every grade of the work from hack boy to burner and setter. He is familiar with every phase of the brick-making business as we manufacture them, and we can conscientiously recommend him to any brother brickmaker as an industrious, honest and efficient helper."

Thus ran the letter of recommendation which we gave a young man who was about to leave us to try his fortune in one of the largest brick manufacturing centers in the United States. He thought, perhaps, he could do better in a larger factory if he could only get a start there, and he came to us to assist him in getting a position.

We were sorry to lose his services, but were willing to do all we could for one who had served us so long and well. We told him to try to get a position there and we would fill his place temporarily, and should he fail he could drop back to his old job. But he did not fail. The manager of the first factory at which he applied told him that he had no vacancy at present, but if he was willing to work at odd jobs at common wages he would employ him, and if all proved satisfactory he would give him a permanent place as soon as there was a vacancy. He soon got a permanent position, and we believe he will hold it, or a better one, for a long time.

And this is our text for a short sermon to the young brickmakers who read The Clay-Worker.

Do you look upon your labor as a means of education to fit you for your life work, or simply as a means of earning so much money per day?

Your labor may be hard for you to perform, and may not be your choice of jobs upon the yard. Are you honestly trying to make it a stepping stone to something better, or are you contented to drag along and trust to chance to turn up something better for you?

You may be anxious to get a promotion, but are you sure you know all there is to be learned just where you are?

During the months you have been employed at your present job, have you learned anything that would make you a more valuable employe and thereby entitle yourself to promotion?

Have you studied your employer's interests and shown a willingness to sacrifice a little of your own time to help matters along, or do you drop your shovel as soon as the whistle blows, without even emptying the shovelful you had then lifted into the air?

You may be looking for an easy job; you will have to look elsewhere than in a brick factory for it. It is true that there are some places more desirable than others, but these more desirable positions must be won by patient, intelligent service in the other grades of work, and by a show of special fitness for the coveted places.

If you wish to learn more than you now know about the engine or other machinery, do you ever volunteer your services to assist the engineer in repairing the same, even if you never get a dollar for your services?

We needed a foreman over our machine gang—one who knew all about the machinery used in our process. We selected a young man from the ranks, who showed considerable aptitude for this kind of work. Some of the men who had been in our employ for a much longer time murmured at this selection. But we answered that we selected the man who, in our judgment, seemed the best for the place. The factory was never closed for repairs, but this boy hung around and watched every piece of machinery as it was overhauled and volunteered his services wherever he could lend a helping hand.

What he learned was all the pay he ever expected, and was all he ever got until he got his promotion. Every piece of machinery was as familiar to him as to the man who made it. And after events proved that we made no mistake when we made that promotion. There were some of his companions who enjoyed the same privilege as he, yet to-day they know nothing of practical value about brick machinery. They have learned very little during their years of employment outside of the narrow sphere in which they labor, and seem to care nothing about gaining any further knowledge than is necessary to enable them to earn their daily wages.

Out of the hundreds of employes we have had during the last ten years, not ten of them would to-day be called good brickmakers. The ambition of the average workman seems to need a general awakening. My neighbor's son quit school to take a place in his father's factory. He was given his choice of places, and chose that of secretary and bookkeeper, when there was not sufficient business to justify giving a salary to a man for that especial purpose. He has been in that position for five years, and to-day knows nothing of the business of manufacturing. Should the father die, the son would be unfit to conduct the business, for the details of manufacturing are as unfamiliar to him as to one who had never been connected with the factory. He missed the best opportunity of his life to learn a useful trade and perhaps some day succeeding his father in conducting a profitable business.

But what will I do when my boy gets large enough to ask for a job on the yard?

He will not be made secretary, nor given any other soft snap in the factory. He must commence at the clay bank and work his way through every department and learn the duties connected with each in its turn.

He must learn all I can teach him about engines and machinery, brick setting and burning, fuels, clays, kiln construction and the hundred and one minor details that go to make an up-to-date brickmaker. And all must be learned by filling a workman's place in each department.

By the time he has learned all this he may be capable of filling some office in the company with credit to himself and profit to the concern. That is the road he must travel, or look elsewhere for a job.

BRICKYARD COMICS.

"I'd be all right if I could only get half a show, but everybody is jumping on me," said the treadle.

"Serves you right, you mean thing. You never get jumped on but you have to pull me down with you," said the follower.

"You needn't talk," said the carriage. "I find you in my track every time I run in."

"Well, you don't always follow the straight path," said the mold. "You're often off the track."

"If I was a false mold like you I'd keep my mouth shut," said the pug mill.

"Oh, you're a sour old crab yourself," spoke up the sweep.

"Collar it, Cully," said the tenant.

Then the horse started, and the striker swore that the devil was in that old machine, because everything about it worked wrong.

* * *

Hardware dealer: "Who is that man who just went out?"

Clerk: "He is a musician, I think."

Hardware dealer: "Musician—nothing. He don't look like he could play a jewsharp."

Clerk: "Well, anyway, he inquired if we had *loots* for sale, and I told him we didn't keep musical instruments."

P. S.—Here is the key: "Loot," a scraper used to level surfaces in mud yards.

BRAINS ARE NECESSARY.

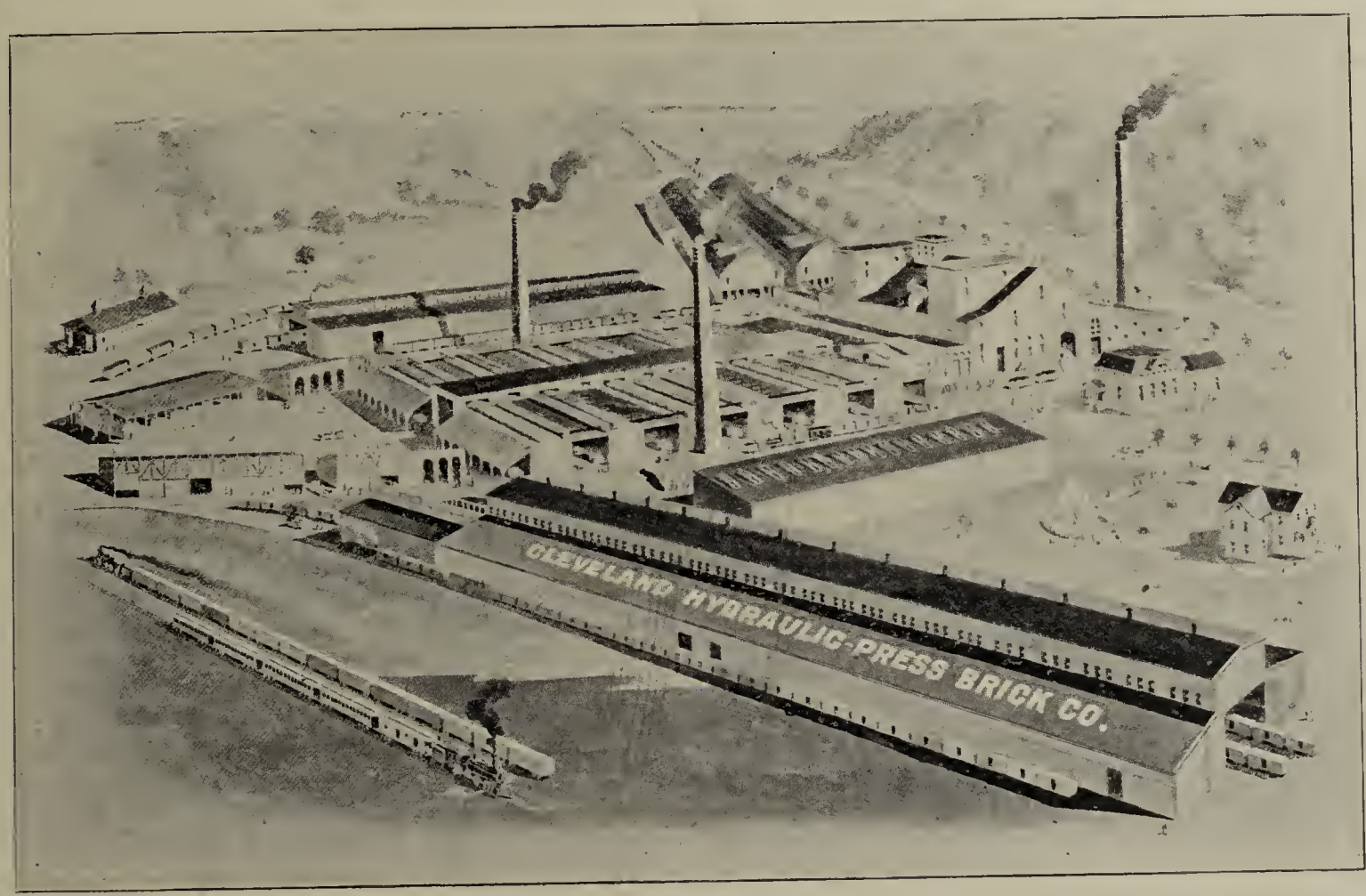
What the business world wants is brains. The man who puts brains in his work is sure to rise. Anybody can do what he is told. A boy can run errands or carry a message, but the man who can use his brains and take upon himself the responsibility of directing his own work is worth his weight in gold.—Ad Sense.

A GREAT OHIO BRICK PLANT.

Where the Reddest of Red Pressed Brick Are Made.

AN IDEAL, UP-TO-DATE brick plant, says The Brick Builder, is that of the Cleveland (Akron) Hydraulic-Press Brick Company, a member of the extensive hydraulic family. The plant is situated about midway between Akron and Cleveland, O., and is one of the best equipped establishments for brickmaking in this country. It differs from the conventional brickyard in that its houses are all built of brick and filled with ponderous machinery. Like the other members of the hydraulic family, the Cleveland (Akron) Company makes bricks of various colors and shapes, but the distinctive color of their product is that of a bright, warm red, which they produce in some twenty shades of this color. This particular brick has contributed very materially to the architecture of many cities throughout the country.

The great success of this plant is due to the splendid executive ability of Mr. W. H. Hunt, its general manager, though this he modestly disclaims, declaring that it is due to the superior quality of the product. While it is true that their Akron slate burns a deeper, redder red than any we have ever seen, there is something more than this to be taken into account when considering the remarkable success of the Akron brick. Those who know Mr. Hunt know that it is his personality, his push and perseverance that has built up one of the largest press brick industries in the United States, and there is fully as much credit in this as in the establishing of a great bank, an extensive mercantile establishment or any important enterprise.



Works of the Cleveland Hydraulic Press Brick Co.

Importance of Trade Papers.

The book writer, says Tecumseh Swift, in the American Machinist, deals mostly with what has been, while the trade journal has to do much more with what is and what is coming. The trade journal cannot be made by one writer, as the book can, but needs the active co-operation of the many, and it must be in touch with many more. I can understand much better how a live mechanic can get along without many technical books than I can his living and thinking he can know what he ought to know without his trade paper. I have an idea that the trade papers are to become more important and useful and necessary as the years roll on, and that no one can keep the run of progressive development and attainment without them.

GOOD TIMES AND SOME HOBBIES.

OVER A YEAR ago I saw articles written in several of our magazines and large dailies, saying that inside of a year brick and all other clay products, the former especially, would have a good and steady market and a stiff price attached. This prediction has come true and been fulfilled. Brickyards are springing up where least expected, on hillsides, bottom lands, in fields, in fact they can be seen in most any old place. So long as a purchaser can be found for a few acres of land on which to erect a plant, anywhere from a one-horse concern up to the modern and up-to-date plant, with full equipment for service. Right in this vicinity a plant is being put up for the making of builders. Please bear in mind that this same community could not get a concern to start up a plant here three years ago, though at that time offering a small bonus. Now the party who is putting up the yard had to plunk down cold cash for the same ground.

It is not brick alone that is scarce and hard to find, but a man who makes a good and satisfactory machine for these wares finds that he cannot fill orders as promptly as he did several months ago. Even the very tools and labor seem to command a premium. I will admit that perhaps one can find a yard here and there that is on the retired list, chiefly because it's a back number or else has that tired feeling and is run down. In other words it only needs some push and a little enterprise to make it a paying investment. The one great fault, or the chief one anyhow, is, you go ahead and permit your yard to run down. By this I mean, don't let your superintendent allow things to be neglected, especially so when he finds it is in first-class condition. One slow man

in a gang has a tendency to make the rest so. The same may be said in regard to the outfit, one bad machine in a bunch of good ones will soon retard the balance of them. Of course, where a man finds things in bad shape at a plant which he takes charge of you cannot justly expect him to keep the plant running, make a perfect product and repair, all at the same time. It is entirely out of the question for him to do so, and what's more, a level headed man would not expect this miracle from his employes, be he superintendent, laborer or mechanic.

I have often noticed with keen interest the way a superintendent addresses the head man of the concern to his face, and then behind his back. Such men soon influence others, and as a general rule things are soon in a tumult, only the level headed ones not being in it. These same kind of men who have an entire plant under their charge show their ignorance. once in a while. They have what is called a "hobby" and this hobby business plays havoc at times. Here is one of them. I was once employed at a large plant, where everything was of the best, all the machinery was in pretty good condition with perhaps one exception (it was of no importance though). Anyway the new superintendent kicked on every piece of machinery in the place, and said it was no good and he kept this up continually. He took especial delight and a great deal of interest in some certain makes of machinery, where on the other hand he did not care a rap how soon some other make of machine would break or give out. For instance B was making an inferior machine to that of C, but the superintendent would stick to B's simply for the reason that he had met one of B's salesmen, or, perhaps, he came from the same country or town that B did. At the same time he knew that C had the best machine on the market. Such mean partiality is injurious to all concerned, and what's more, the sooner a man with this kind of a hobby is found out and dismissed from an active establishment, the better it will be for all concerned. This same man with a wise head continually found fault with a large pug mill, and insisted that the mill be thrown in the canal and a small auger machine 20 years old be put in its place. The very idea of itself was crazy. Imagine for yourself to throw out a large well-built pug mill, in fair working order, with a pugging capacity of 9,000 per hour, and substitute a small, second hand machine with a rated capacity of 20,000 per day. See the point, or, in other words, the hobby again.

Well, he took no interest in anything, only when the pug would buck, or go wrong, then he would shout and feel happy. He finally got the head man to consent to throw the blasted thing out and fix his wee little shining star up and put in, as a competitor. Once done the real fun began. His little dividend maker made money as long as it was not running (and the blacksmith and machinist got the dividends). Hardly a working day passed but that little machine needed some repairs, so after this deception was kept up for some time, the big pug was re-installed, given some repairs and started off satisfactorily to all concerned, and at this writing the pug is still jugging away and the superintendent is still hunting unconquered grounds.

A. HOBBY.

A Relic of War Times Causes Trouble in a Brick Plant.

An accident of mysterious origin happened at the plant of the Suffolk Clay Company, near Suffolk, Va., July 10. With a loud noise two big steel rollers belonging to the disintegrator were partially wrecked, and in the absence of actual proof the secretary of the company suggested that the break-up might have been caused by an explosion of an old bombshell. The clay was taken from breastworks erected by Gen. Peck in 1863, and from which numerous war relics have been dug. The disintegrator would crush rocks without stopping the machinery.

Written for The Clay-Worker:

SEGER CONES; ARE THEY PRACTICAL?

D. W. Stookey.

I AM NOT AN ICONOCLAST. It is an unusual thing for me to "stem the flood" that is popular. It may be presumptious for me to say a word against an idea or a principle that has received favorable consideration from recognized authorities and scientists. I hardly think that I would be pointed to as one who sought notoriety or publicity. With Paul, I believe we should "prove all things; hold fast that which is good."

It is well that we should have the aid of all that is of practical use in working clay. It is interesting often to see and know the exact workings and discoveries of scientists, but many things that are of utility to science and essential in conducting scientific investigations are not adapted to the needs and capabilities of practical work in the same lines.

Scientific experiments and investigations are conducted to determine laws, facts and phenomena that can be considered as exact. For this reason the investigations and experiments must be conducted with a nicety and accuracy that is not within the means nor possibilities of the practical man who labors in the same field in an industrial way. The scientist employs methods and apparatus in his researches that are nicely adapted to his needs, but these are often of no especial value to the practical or industrial worker.

—The Origin of Seger Cones.—

Seger cones found their origin in the fact that certain definite substances melt at fixed temperatures and that the melting point is different for each substance. Necessarily the substances, if elements, must be pure and if compounds, must always be of the same composition. Alloys are generally more fusible than either of the metals of which they are composed.

Tin melts at 228 degrees and lead at 335 degrees Centigrade, but an alloy of five parts of tin and one of lead fuses at 194 degrees. Bismuth melts at 264 degrees and yet the alloy known as "Rose's fusible metal," which consists of four parts of bismuth, one part of lead and one of tin melts at only 94 degrees. Cadmium melts at 321 degrees, and the alloy of one or two parts of cadmium, with two parts of tin, four parts of lead, and seven or eight parts of bismuth, known as "Wood's fusible metal," melts between 66 degrees and 71 degrees Centigrade. Steel melts at a lower temperature than iron, although it contains carbon, which is almost completely infusible.

A mixture of the chlorides of potassium and of sodium fuses at a lower temperature than either of its constituents; the same is the case with a mixture of the carbonates of potassium and sodium, especially when they are mixed in the proportion of their chemical equivalents.

A familiar application of this property is met with in the use of fluxes, which are much used in metallurgical operations. They consist of substances which, when added to an ore, partly by their chemical action, help the reduction of the substance to the metallic state, and partly by presenting a readily fusible medium, promote the formation of a regulus.

Hence, it is apparent that very great care must be exercised in the compounding of the ingredients of the various Seger cones that are to fuse at specified temperatures.

Changes in the chemical composition of the ingredients very materially affect the melting point, and unless they are reliable and true they are worse than useless, as they profess to show definite temperatures.

To be exactly exact, if I may use the expression, it might be necessary to take into consideration the latent heat of fusion of the composite cone and also the conducting power of the

cone and of the ware in the kiln. The cone might, by possessing a greater conductivity, become heated through before the ware and would thus show fusion or the temperature at which it fuses, before the ware had had time to attain the same degree of heat.

It is not my intention to attempt to detract from the interest in or use of the cones in certain places and for certain purposes, but to urge the necessity of their being accurately prepared. I believe that this can only be done by careful and competent chemists.

—Large Cones Best.—

The cones should be as large or thick as the brick or ware in the kiln with them. Clay has such a low power of conducting heat that much time is required to pass heat from the surface to the interior of thick pieces of brick, sewer pipe, terra cotta and other heavy clay goods.

The small Seger cone might become heated through and fuse before the high temperature of that part of the kiln had passed very far below the surface of thick pieces of clay goods.

Every practical burner knows that with the furnaces in general use, both patented and unprotected, that the temperature of the kiln near the furnaces is subject to great variations within comparatively short times. The fires will burn freely and the furnaces and fire boxes, together with those parts of the kiln near the furnaces, will become very hot, often too hot, and as the fires burn down and are replenished with fresh coal, their temperature falls. Thus the degree of heat in the kiln near the furnaces varies at intervals from lower to higher and from higher to lower. These periods of high degree may be long enough to thoroughly heat through and fuse a small Seger cone, while they would be of too short duration to materially affect a thick piece of ware near by.

The duration of these heated periods is so short that the kiln only attains the high degree a very short distance from the furnace at each time the temperature rises, and while a small cone may show an excessively high temperature, the kiln only a short distance away does not attain that temperature, and the cone fuses and raises a danger signal that only has reference to the immediate vicinity of the furnace and only for that one period of high temperature.

The cone has been fused and destroyed and a new one must be introduced else the kiln will be without protection at that point. That is, it might be necessary to introduce many cones into the kiln in the vicinity of each furnace during the process of burning, for the burner desires to keep his fires as hot as he can without injuring the ware. This continual or repeated necessity of introducing new cones would entail a great amount of trouble and care on the part of the attendant. Because of the different temperatures in the various parts of the kiln it would be necessary to place cones in many places in the kiln if cones are to be relied upon.

During the burning the heat gradually advances through the kiln from the furnaces and this advance must be noted and the condition of the heat at various parts of the kiln known if the heat is to be applied intelligently. These cones must all be placed so that they can be readily seen and watched as the heat advances. When the heat near any cone approaches the fusing point of that cone it must be watched carefully in order that the attendant may know when it fuses, else its utility will be lost. It obviously would be difficult, or at least would necessitate an immense amount of trouble and attention to watch cones throughout the kiln as the heat advanced and to keep them renewed when one failed. I am of the opinion that few burners would use them in general practice.

The objectionable feature of oscillations of temperature can only be obviated by mechanical stokers, or an industrious system of hand firing that closely approaches the continuous methods of the mechanical stoker. I have always advocated, and will on every possible occasion, the practice of tending the fires as often as possible and giving each one just as much fuel as it can use to good advantage. The best results can never be obtained by a fireman who puts in a large amount of fuel at one time and then sits and waits until his fires burn down.

—The Burner Is a Specialist.—

A great many manufacturers of the coarser class of clay goods, and particularly brickmakers, mix several strata of clay. Experience has taught them that the best results can be obtained by the use of the mixture of the various layers of clays, each of which has characteristics different from the others.

The proportions are not always the same and the exact temperature best adapted to each may be different. When they are mixed in different proportions the heat necessary to burn them will depend upon the proportions in which they occur in the particular kiln to be burned. Again, many clay banks differ from one end to the other, and the degree of heat required to burn a kiln of ware made from one end of the clay bank might be very much lower or higher than that required for ware made from the other end. A burner is very often heard to say when a kiln is opened that it is harder than he supposed it would be, or that he thought he had burned it harder than it appears.

The practical burner of heavy, coarse clay products judges of his temperature by the color, by the shrinkage or settle, by the sticking or by try pieces. He knows little and cares less what the temperature of his kiln is as measured by Fahrenheit or Centigrade. He probably would not use Seger cones nor pyrometers if they were given him. He has learned to know his clay and his practical, intuitive knowledge must be relied upon. He must be trusted as we trust a skilled physician. He is a specialist and in this age he who is not a specialist is nothing. The practical burner knows his clay, the heat, the color and all those things that he should know. If asked how he cannot tell another so that he could do the burning as it should be done, nor as he can do it himself. I have known men who had helped fire kilns many times and who could be trusted with the fires for six hours alone, but who never advanced far enough to judge as to when a kiln was done or whether it needed to be kept hotter or not. They approached the characteristics of a burner, but never could have become successful burners who could be relied upon. Neither do I believe all the pyrometers and Seger cones in Christendom would have supplied what was lacking in them. As a curiosity on a brickyard cones would be very interesting. As a ingenious application of the various fusing points of different substances they are worthy of notice.

They undoubtedly will prove of great value in the testing of clays and in determining the amounts of heat they will require. As a technical means of indicating relative and absolute degrees of heat as applied to clay burning they will prove very useful when properly prepared and numbered according to their fusibility. When a standard list of cones of known chemical composition, coupled with a corresponding series of degrees of heat, has been accepted, and is understood, they will be of great value as a means of determining, recording and communicating to others the results of scientific researches into the pecularities of clays to be investigated. Farther than this, I can see no opening for them. It is conceded by all that the structure, both mechanical and chemical, of each bank of clay is peculiar to itself. Conceding this is equivalent to accepting as a truth the thought that each clay must be worked in a peculiar way, and that this particular way must largely be learned by experience. In short, the successful manufacturer of the coarser grades of clay goods must be a practical man. He may have a scientific education and will need it, and it will be of inestimable value to him, but above all he must be practical. He must apply, adapt and modify his scientific knowledge to the special cases under his care. Some theories he can use, some he can apply only in part, and some will not apply in his special case.

Written for The Clay-Worker.

THE RUSSIAN BRICK INDUSTRY.

By C. E. Carpenter.

A RECENT BOOK OF STATISTICS, published at St. Petersburg, Russia, contains the information that during the last year no less than twenty German manufacturers of clayworking machinery carried on a regular trade with Russia. Each of these firms possessed its own establishments or branches throughout Russia, and transacted its business through its regular agents. These figures speak well for the energy and business methods of machinery makers in the Fatherland, besides testifying to the enormous and growing market existing in the Czar's domains for modern and up-to-date manufactured goods. Indeed, in view of the colossal impetus given to the building and the manufacturing industries of the empire by the opening of Siberia, it is safe to assume that the sums of money taken out of the country last year by the twenty manufacturers referred to aggregated several million roubles.

Of all European countries, Russia is, practically speaking, the youngest in the manufacture of building materials. While statistics show that the making of pottery and fire brick extends back to time out of memory, and while pottery in particular constitutes one of the most widespread branches of industry of the Empire, the manufacture of brick on a large scale is actually a development of the past ten years.

It may be mentioned in passing that long before the establishment of the present large plants the working of fire clays was carried on extensively as a so-called household industry, i. e., in certain districts every family had a small, crudely equipped plant of its own, with which they produced brick for sale to the large dealers in building materials. These primitive methods obtained for many decades in the government of Novgorod and other districts abounding in fire clays, and formed the sole means of production until twenty years ago, when the first large plant was founded in the district of Borovichi.

Previous to this period (namely, 1880) the Russian market for high-grade fire brick was supplied almost exclusively by Great Britain, the English brick sold in Russia being not only of a quality superior to the Russian, but considerably cheaper in price. The lower cost was due to the poorly developed transportation facilities between the Russian capital and the clay-producing districts. For example the freight on a ton of brick from Borovichi to St. Petersburg amounted as a rule to $2 and $2.50, whereas the rates from New Castle, England, to the same point never exceeded an average of $1.50 per ton.

The general excellence of English brick and its lower cost were sufficient to seriously handicap the Russian industry, and not until the year 1891, when the government was induced to impose an import duty of 4 kopacks in gold per pound (36 pounds) on imported brick, did the local production gain a foothold of real strength, that made the present progress of development possible.

The large plant in the Borovichi district already mentioned is owned and operated by the firm of K. Z. Vachter. These works are located in the village of Zhdani, near the huge clay deposits of Borovichi. Previous to the imposition of the import duty on fire brick, this plant had attained an annual production of 2,500,000 bricks; these figures increased shortly after 1891 to 5,000,000, until at present the output is not smaller than 8,000,000. Of course, an output of this size is small in comparison with that of such European concerns as Hoganas, in Sweden; the Glengoigs, in Great Britain, or the Baumaterialien Gesellschaft, in Austria, yet considering that it is practically a mere beginning made by private enterprise under uncertain conditions, it may be regarded as an evidence of the future progress that is destined to be made by the industry in Russia.

The Vachter plant at Zhdani is also a pioneer in the manufacture of drain pipes and stoneware. An important annex was built to the plant a few years ago, and equipped with three rolling and three cylinder presses for working the clay mass.

Summitville (Ind.) Tile Works; Removing Large Tile from Press.

Emptying a Kiln at Cowgill's Tile Factory, Summittville, Ind.

For fuel, wood, dried thoroughly in special wood kilns, is used. There are four such furnaces at the factory, with a general fire grate surface of sixteen meters. This equipment enables the works to produce daily from 400 to 500 pipes, one arshine long, as drain pipes are generally made at Russian factories, and 6 to 9 inches in diameter; thus the average production amounts to 120,000 pipes per year. Pipes of small diameter, beginning at two inches, are also made, but these hand presses are used; large pipes are also made, 12 and 18 inches in diameter, and when specially ordered, of 24 inches.

The brief description I have given of the Vachter plant will serve as an illustration of the general state of the brick industry in the Russian Empire. According to the official statistics of the St. Petersburg government the total output of bricks in Russia and Siberia amounts annually to something over 1,000,000,000; 200,000,000 of the total are produced in the district of Moscow; 100,000,000 in the St. Petersburg district; 80,000,000 in the government of Kharkov; 70,000,000 in the governments of Kiev and Ekaterinoslav each; and 50,000,000 in each of the provinces of Tauride and the Don. In these rough figures the local production of brick by the metallurgical works for own use is not included; nor are the figures for many of the smaller establishments throughout the Empire. Siberia's output of 10,000,000 bricks is also not included.

As fully evidenced by the foregoing figures the brick industry in Russia and Siberia is fast traveling the way to success, for keeping pace with the growth of the industry is the enormous demand for building materials both in European Russia and Siberia. All cities that are so fortunate as to be in the immediate vicinity of the Trans-Siberian Railway are making great strides in industrial and commercial development. Manufacturing plants of every variety are daily springing up in hordes along the railroad, demanding large quantities of brick and machinery. Indeed, conditions on every hand point to one conclusion—progress.

If Germany, England, Belgium and France are to have so free a hand in supplying the wants of Russia, there should be no reason why United States manufacturers should not have a share of the spoils. In the manufacture of clayworking machinery the United States surely takes the lead. And yet there are twenty German makers in the Russian field at present, with not a single American to offer competition.

Written for THE CLAY-WORKER.

BUSY TILEMAKERS.

They Meet at Summitville and Sample Samuel Cowgill's Hospitality.

IT WAS OUR PLEASURE recently to receive an invitation to meet with the tilemakers of the Indiana gas belt at Summitville, a thrifty little Hoosier town some fifty odd miles from the capital, where those who will stop off between trains will find the largest drain tile manufacturing establishment in the world.

Arriving at the station, we were welcomed by Mr. Cowgill himself, who, after a cordial greeting, drove us in his private carriage to the factory, where we found a dozen or more of the representative tilemakers of the gas belt section discussing the trade situation. Without exception they reported a healthy and satisfactory condition. Despite the fears of some who predicted several years ago that the tile business was overdone and that there was little then left because, as they thought, Indiana farms were pretty thoroughly underdrained, the business has continued to grow and these enterprising tilemakers who, when trade fails to come to them, go after it, find that the demand for tile is sufficient to take all that they can make. More than this, some of these manufacturers are now turning out a quantity of tile that would have seemed enormous in earlier days.

—A Social Organization, Not a Trust.—

It has been reported at various times that the Indiana tile men have formed a trust or combination for the purpose of controlling prices, restricting competition, etc. This we found

is wide of the truth. The organization is wholly and solely for the purpose of cultivating friendly relations, and to that extent only does it affect competition. The members meet each quarter and talk over improved methods of manufacture and other matters of common interest. This they have found alike pleasant and profitable. We can bear testimony on the pleasure side of the proposition, for our stay in Summitville was made most enjoyable.

Office of the Summitville Tile Works.

—The Largest Tile Works in the World.—

While the tile men were talking shop we sauntered through the factory and found many little details of more than passing interest. There are two complete plants, each equipped with Hoosier tile mills from the factory of Madden & Co., at Rushville, Ind., on which they make their small tile—sizes ranging from four to eight inches. All sizes above this to 24-inch tile are made on sewer pipe presses.

The method of handling the large tile is quite simple; they are received on end on wood pallets and placed on trucks holding a half dozen or more, according to size, and wheeled to the drying rooms. These are immense three-story structures. Beneath the ground floor, which is slatted, are rows of gas pipe perforated in a manner to permit a jet or blaze at intervals of a foot or more. In this way sufficient heat is engendered to heat the entire structure. When the lower floor is filled with green ware the loaded trucks are run on to an elevator and hoisted to the floor above. In this way manual labor is reduced to a minimum.

—Handling Large Tile.—

When the tile are dried sufficiently they go to round down draft kilns. The manner of handling them in this latter stage is surprising, and seems at first glance rather reckless. They are turned on their sides and rolled over the floor to a door near the kiln, where a workman catches them, hoists them on to a board and they go sliding down into the kiln to the setter, who continues the rolling process to the point in the kiln where they are to set and again up-ended. There is no nesting of tile done here now. When the bottom of the kiln is covered another layer is started, the tile being rolled over the ends of those first set, and this process is continued until the kiln is filled. It would seem to the uninitiated as if this would be a rough way of handling the green tile and that there would be much chipping of edges as a result, but such is not the case, though perhaps it would be in the hands of less expert workmen.

From the kiln the tile go to the cars ofttimes so warm that they almost set fire to the wagon bed, or in slack times are piled on the yard in great rows, to await the demand that Mr. Cowgill knows is always sure to come in time. His faith in the efficacy of tile drainage is such that he goes on planning for increased facilities with all the enthusiasm of a novice. Not satisfied with their immense plants at Summittville, they have established similar works at Montezuma, Ind., where they are now making

—The Largest Drain Tile Ever Produced.—

The accompanying photograph will give our readers an idea of the proportions of a 30-inch tile. Each one of these tiles weighs 480 pounds. The shell is two inches thick and they are made in thirty-inch lengths. The making and handing of these immense tiles involved new problems, which have been met ingeniously. Special trucks for handling them have been contrived, so that but little additional labor is required to convey them from machine to drier, kiln and car than for the smaller sizes.

A Thirty Inch Tile. Mr. Cowgill on the Left and Mr. Whitney on the Right

After our stroll through the factory we repaired to Mr. Cow-

gill's residence, a fine, large frame structure standing on an eminence overlooking the works, and found the other visitors listening to Mr. Cowgill's experiences while abroad. He told, in his own forceful way, of many amusing incidents of life in the Holy Land, and showed some samples of native brick and other curios which he had gathered in that part of the world, including a bottle of water from the Jordan, which we are free to confess looked less inviting as a drink than Milwaukee's famous beverage. He whetted the appetites of all present by exhibiting a piece of odiferous bread such as constitutes the chief diet of the common natives, and then announced that dinner was waiting. The dining room was prettily decorated with flowers, and a most toothsome and satisfactory dinner was served by the Misses Cowgill, after which the entire party boarded Cowgill's special express and made a flying trip to the claybank.

—A Special Train.—

The C. S. E. consisted of a dummy engine and a couple of clay cars. The latter are double the size usually used for hauling clay. The trip was thoroughly enoyed by all and the engineer received many congratulations on the superior character of the service which, though intended for freight only, answers admirably for such short excursions. The clay bank is about a mile and a half from the factory, but the facilities for handling the clay are so complete that the cost of getting the clay from bank to pug mill does not exceed ten cents per ton. The clay bank averages about four feet in depth, and as they have several hundred acres, there is no danger of running out of raw material.

Mr. Cowgill prophesies that following the present wet season there will be an increased demand for tile throughout the Central States the coming fall.

Cowgill's "Special" and the Excursionists.

The Clay Bank.

ONE CRANK'S VIEWS OF VACATIONS.

"Come up in the woods with me for a week's fishing. You can be spared all right, as this is the dullest business season in the year."

"That's why I can't go."

"Why is it you can't go?"

"Because business is dull."

"That's too deep for me, but you evidently have some crank ideas on the subject, so unburden yourself."

"Well, it's like this: When business is as slow as it is at present—and it is pretty near dead—I can't afford to let any of it get away. If things were coming with a rush the little that would be lost by my taking a holiday would hardly be missed. Just now, however, all the attention that can be put into it can hardly make it pay running expenses. Your argument might be all right regarding an establishment with a large staff, as one man would hardly be missed; but in my case, having very few assistants, it's all wrong. Come around in the fall, when business is booming and all hands are working overtime, and I'll take a week off and go shooting with you."—Ad Sense.

Written for The Clay-Worker:

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 10.

BY ALFRED CROSSLEY.

—Methods of Manufacture.—

MOLDING AND PRESSING, or the actual making of the brick, is the next step that claims our attention. Of course, it will be understood that I am now speaking of the old style hand method and the foregoing description of grinding and tempering processes is in special reference thereto. I will make some reference to machine methods before leaving the subject, but take up the hand process first, as it is the established order of things. In England, the brick are made of very stiff clay, in brass molds and are not pressed. They are perfectly solid and square and, in fact, need no pressing, being better finished than many are in America which have been pressed.

A day's work of hand-made fire brick out of brass molds for one man and a boy is 2,000 to 2,500. Considerable skill and practice is required to make them well and keep them in good shape as they are set down on the floor. This method seems never to have been adopted to any extent in America, although so many English workmen have come out here. The almost universal plan in America is to mold in wooden molds, of very soft clay, or mud, as it is technically termed, spread the brick on a warm or hot floor to stiffen, afterward press in a hand-lever press, and return to the hot floor to finish drying. The object of pressing is not so much to make the brick dense as to square them up and put them in better shape. Where hand molding and pressing, as above described, is followed, a day's work for a molder and two boys is 4,100 nine-inch brick, the 100 being to cover waste. The press gang, which consists usually of one man and two boys, follows the molder when the brick are ready and presses the same lot for its day's work. This method of making is followed pretty generally in every fire brick section of the country, east, west and south, and will probably continue to be largely made in this manner for sometime yet to come, although several efforts have been made, with more or less success, to introduce machinery for this work, and I believe as this comes to be better understood, fire-brick making will yet yield to the touch of progress, and machinery effect a revolution in methods.

A few words here in regard to presses will not be out of place. Hand pressing is almost the universal rule, but there is a pressing demand (excuse the pun) for something better. This has to a considerable extent been met in recent years by the introduction of three or four really excellent steam power

presses. In fact, taking America and England together, we may say that there are at least double that number, each possessing considerable merit, and all useful machines. These have been much more largely adopted by the front and paving brick makers than by fire brick men. By the use of these a saving of at least half the cost of pressing can be effected. At the same time it has often been claimed that there is no real advantage in steam pressing, that hand presses can be moved about to suit the work and are handier, etc. There is a semblance of truth in much of this, but when really sifted down, there is very little in it. No account is taken of the time that is taken up in moving the press around, nor of the fact that the brick have to be moved from the warm or stiffening floor to the hot or drying floor, and hence but little more moving is required to press them on a stationary steam press, and with the different system that can be adopted, the saving in cost is as above stated.

In the St. Louis factories they have adopted a somewhat different method from the above named, at least such was the case a few years ago, and I presume the same method is still in vogue. Here the clay or mud is made very much stiffer and molded direct into the press box of a hand press, and when it leaves the press is finished ready for drying. Of course, a man cannot make so many brick—not over about half the quantity—but the saving of so much unnecessary handling, and the saving of room required should make a decided reduction in the cost of the brick. This, of course, is confined to 9-inch work, or, at farthest, to 13½x6-inch furnace block, which are largely used. All large shape and special work is, of course, made in wooden molds by hand, and I am convinced from practical experience that there is hardly likely to be any change in the method of making this class of work.

In the various forms of nine-inch work, however, which forms the staple of the fire brick business, machinery has been introduced with successful results, both in England and the United States. This is emphatically a mechanical age, and the tendency is for the application of machinery to every industry. The influence of this has long been felt by nearly every other department of clay manufacture. Fire-brick makers, as a rule, however, have been content to go on in the old humdrum way, and the molder still laboriously makes his "clot," or "wauk" or "pone," and whacks it into the mold. In fact, fire-brick makers, for the most part, seem to have settled down to the idea that they will never be made any other way as long as the world stands, and few of them would even listen to the idea of making them by machine. In fact, there used to be a very decided notion that they could not be made in any other way. But all this is no argument, and it should not be forgotten that similar opinions have been held on many other things in regard to the adoption of machinery. There was, up to a few years ago, some excuse for this deep-rooted prejudice, for it must be confessed that many failures and few successes had attended the attempts at machine made fire brick until within recent years. But every failure, if carefully observed, is a step nearer success, which should eventually become the universal result. The late Mr. Joseph Cowen, M. P., of Newcastle-on-Tyne, England, at one time one of the largest fire brick manufacturers in his part, and, therefore, no mean authority, has indorsed the opinion that fire brick will always be made by hand. In a communication on the subject he says that "In the North of England (Northumberland and Durham) attempts had been repeatedly made to produce fire brick by machinery, yet without success, whereas in Wales such an application has succeeded, owing, it is suggested, to the Welsh clay differing in quality from that of the North," and again, "this article (fire brick) continues, and always will continue, to be made by hand. Machine-made brick are always more compact than those made the old way, and this I consider a defect." Right here I think Mr. Cowen struck the keynote to the cause of most of the former failures.

Writing on this subject about ten years ago, I remarked as follows: "If I may make a prediction, it is that the semi-dry process will, sooner or later, be adopted to the production of the very best fire brick. In this principle there is, as is well known, a tendency to granulation in the brick, and in a fire brick we want a granular body. But if we go at it blindly, and without using intelligent experience, we shall not get what we want. One of the great objects among all makers of dry press machines has been to overcome the granulation in the brick, which in a building and sewer brick is a fatal objection, and they have accomplished this by making the clay extremely fine, and by greatly increasing the pressure exerted by the machinery on the brick. But if we apply the same principle in fire brick making, we are getting right away from where we ought to be, and to fail is certain. If this principle of machine is ever successfully applied, it will be in a machine that will have just sufficient pressure to make a brick sufficiently solid to bear setting in the kiln and burning, without any danger of falling to pieces." It is somewhat remarkable that about the very time the above was written, as I afterward learned, this thing had been successfully accomplished in England, by what became known as the Johnson system, and which about the same time was getting its first introduction in the United States, in that instance on Jersey clays, and subsequently adopted at St. Louis, on Missouri clays, and at Louisville, Ky., on Kentucky flint clays, thus establishing its success on three of the representative fire clays of America. I have myself seen it adopted with clays that were very difficult to bind together in a semi-dry state, and producing brick that stood a higher test than brick from the same clays, hand molded, had previously done. From my more recent experience I have come to the settled conclusion that high grade fire brick can be made on any of the good types of dry press machines now before the trade, and by carefully observed tests have demonstrated, to my own satisfaction at least, that fire brick made on a dry press machine from confessedly inferior clays, have stood equal to those made from a much superior clay, by the hand method. In making fire brick by the semi-dry process, there is no essential difference from that adopted for building brick, but the two or three points following should be carefully noted and observed—the clay should not be ground to a fine powder, as in the case of front brick, but to a proper and suitable grain, which I have before described; the pressure required will not be as great, although this depends on the class of clay under treatment, clays that do not bind easily requiring more pressure than others; the clay must be as damp as can be worked. These three points have mutual relations to each other, which intelligence and experience will be quick to perceive and apply. I am aware that fire brick made by this process require more care in handling to preserve them intact, but to my mind this is the ideal method for producing the most refractory brick possible out of any clay.

Beside the semi-dry process, I have seen or known of both soft mud and wire cut machines being used, with varying success, but so far as I have been able to ascertain this has not been the case with high class brick, but only in the cheaper and inferior grades. I have heard of one or two machines both in America and England of the plastic type, which have claimed to be successful in the better grades, but I have no knowledge of this having been confirmed. Enough has, however, been said in this connection to show that in several instances machinery has in recent years been successfully applied, even with clays difficult to deal with, and we may therefore conclude that it is well worthy of increasing and more general attention and consideration.

(To be Continued.)

CARRIED OUT TO THE LETTER.

"Now," said the inconsolable widow, "I want you to add to the death notice, 'Gone to rest,' in an appropriate place."

"Yes, madam," replied the bright young clerk of the Daily Squib, and the next morning she read: "Gone to rest in an appropriate place."—Current Literature.

WRITTEN FOR THE CLAY-WORKER.

CHINESE CERAMICS.

The World's Greatest Brick Structure.

LIKE MOST PEOPLE who endeavor to "keep up with the procession," I am interested in things of the Orient, and as a literary hustler think it just right to take my present "queue" from the "Yellow Terror"—not John Chinaman as a fighter and politcian, but as an artisan. And in this respect I wish to present him, to some extent, as a worker in clay and kaolin.

We are apt to speak slightingly of the slant-eyed Celestial—and on many counts he deserves it; but still the world owes much to him—the sly heathen who had the wheels of progress rolling down the path of time long before Europe put aside its savagery and began to be half-way decent. China was once the cradle of inventions. In the third century of the Christian era paper was made there. The art of printing began there, and also that of printing from stone. Word engraving was done there a thousand years ago, and the Flowery Kingdom was also the birthplace of gunpowder, the mariner's compass, silk weaving, playing cards, chess, tea culture, silk embroideries and porcelain.

As a worker in clay John Chinaman began business about four thousand years ago, and he also, at this early date, used the potter's wheel. Chinese tradition says the making of porcelain began about 2697 B. C., but it is thought that the ware produced then was only a common glazed kind, and that the time of the beginning of porcelain was somewhere from 202 B. C. to A. D. 220. But whether he began "early or late," the Celestial soon showed his ability to make things of beauty —first producing exquisite effects in blue tints, and then through various colors to the famous pink tint, finding nearest perfection in the peach-blow hue. And thus the Mongolian potter went on with his work, making improvements and keeping his secrets, and it was not until the early part of the eighteenth century that the Chinaman's method of making porcelain became known to outside nations.

A traveler in the Celestial Empire, in the latter part of that century, in speaking of the manufacture of this fine ware, says that a village, or unwalled town, called King-te-tching contained three thousand furnaces for baking porcelain, and that when these furnaces were all lighted, the place had the appearance of a town on fire. Pere de Entrecolles, writing from China at an earlier date, also speaks of this town, and gives an idea of methods, material used, etc. Among other things, he tells us that Chinese porcelain (Tseki) is composed of two kinds of earth, namely, pe-tun-tse, a quartzose feldspathic rock, and kaolin, a hydrous silicate of alumina. He says: "These two materials, after having been made into bricks, are brought down the river in flat-bottom boats. The pe-tun-tse is transported some eighty miles, and the best quality is of greenish hue.

" * * * Other barks also arrive at King-te-tching, laden with a liquid called yeou (oil), although tsi (varnish) would better apply, which is made from a very hard stone. It can be produced from the same stone as the pe-tun-tse, selecting pieces having green spots. The history of Feou-leam says the best stone for the oil has spots the color of cypress leaves, or is of a brown color, with reddish spots like toad flax. To this, reduced into powder, is added one per cent. of a mineral resembling alum, called che kao. Yeon is always mixed with ten per cent. of an oil made from the cinders of quicklime and ferns burned together. Formerly persimmon wood was also burnt with the lime, but this has become so scarce it is no longer used, which perhaps is one of the causes of the superiority of the ancient porcelain."

This ancient writer says of the method of decorating ware: "The work of painting is divided in the laboratory between a large number of workmen. One has the duty of making the first circle in colors near the edge of the piece; another traces the flowers; another paints them; a fourth paints mountains and water; a fifth birds and animals. Human figures are generally the worst treated. In the matter of colors for porcelain they have a great number. In Europe we generally see only a bright blue on white ground (blue and white), whereas they have a great variety. I have seen some pieces where the ground resembled that of our burning mirrors."

Pere Entrecolles tells a story of a Chinese emperor who desired a peculiar shaped piece of porcelain, and one difficult to produce. The potter tried to obtain this and failed; for this he was beaten severely on the feet (bastinadoed), and again ordered to make the object. He tried once more, and without success. He knew the bastinado would be again his punishment, and, being terrified, threw himself into the furnace, where were some pieces of porcelain, thus feeding the fire with his body and brains. "So," the Chinese legend goes, "the sacrifice was accepted, and when the furnace was opened, the porcelain had assumed the desired design, and the Emperor was satisfied."

In regard to brickmaking in the Flowery Kingdom, not a great deal is known. Of course, the hand-work process is in use, as labor is exceedingly cheap, and, where there are about 400,000,000 people, more than abundant. If machines were introduced, it is more than probable many, if not all of them, would be destroyed.

For many centuries the Chinese have been makers of bricks, and that they understand this art is fully demonstrated in a great many of their ancient architectural specimens. And this is nowhere better shown than in their Great Wall, which takes its winding way over mountain, valley, plain, hill and river, for a distance of nearly fifteen hundred miles.

In this stupendous structure there are billions and billions of brick—all made from the soil of China, coming, it is safe to conclude, from thousands of kilns, constructed in advance of and along the route of the wall. The blue color of these brick once led to the belief that they were simply sun-dred, but experiment demonstrated the fact that they were kiln-burnt, and besides this, remains of ancient kilns were found near the wall.

Contrary to popular belief, the Great Wall is not a solid body of brick or stone, but is composed of parallel retaining walls of brick resting on a stone foundation and filled in with earth and other material. As to the width of the wall, there seems to be a difference of opinion; some writers say forty feet, others much less than that. But there is similarity of opinion in regard to its height—twenty-five feet. Sir George Staunton, in his "Embassy to China," published in London in 1798, describes a portion of the Great Wall, situated near Koo-he-koo, and gives thickness at cordon as 15 feet 6 inches; at bottom of brickwork, 21 feet, and at stone base, 25 feet. The distance of the towers from each other is considered about 100 yards. In describing one of these the old writer and traveler says:

"It consisted of two stories besides its platform. The lower story was on a level with the terrepleine of the wall. It was a square and almost solid mass of stone, intersected with arched passages in the form of a cross, at each extremity of which was a window or large port in the center of each side of the square. By two of these it communicated with the terrepleine of the wall on each side; thus this tower offers two flanks to the wall. Midway between the entrance and the center of the cross is a narrow staircase, which communicates with the second story. This may be said to contain but one room, formed by three parallel arches in a direction perpendicular to the entrance, having three arched intervals of communication between each. Those in the center are in a line which bisects the building; the others are in a line parallel to this on each side. Thus a square room is formed, consisting of three equal

arches parallel to each other, and three lines of arches of communication, leaving four square pieces of masonry about the center.

"The extremities of each parallel are pierced for ports, three of which face the wall; the center ports facing the wall enfilade the terrepleine on each side of the tower; the others flank the sides of the wall in each direction. In the parapet of the platform are twelve embrasures, three in each front, with loopholes in each interval. Total height of the tower is 48 ft.; length of each side of square at bottom, 42 ft.; at top, 36 ft. * * * The coins of the doors, windows, ports, embrasures and many of the salient angles and staircases in the towers, as well as the stone foundations, are of strong gray granite, with a little mixture of mica in it. The rest of those buildings consist of brick of a bluish color. They are laid in laminæ of a brick thick each; forming, as it were, so many distinct walls as there are bricks in thickness. They differ in their dimensions according to the situat'ons in which they are placed. Those in front of the walls and towers are as follows: Thickness of the bricks, 3¾inches; width, 7½ inches; length, 15 inches. Those for the terraces of the wall and towers differ only from the former in being perfectly square, each side containing 15 inches. Wherever, for finishing the tapering tops of the parapets, bricks of the usual dimensions would not answer, instead of chipping off to the required size, tney were molded to suit the shape wanted. The cement or mortar between the different layers of brick was upwards of half an inch in thickness, and was of calcined limestone. NICODEMUS.

A HOT WEATHER THEME.

IT IS THE season of palm leaf fans, shirt-waists and iced drinks—likewise of the making and burning of bricks. It is the season when the gentleman's collar riseth in the morning like an alabaster wall about the vulnerable trunk of a striding civilization and falleth back in the evening—aye, even before 9 a. m.—like the bedrizzled end of a pot wrestler's mop.

And the shirt-waist man, and the man-made girl, sit by the summer sea, and the shady mountain side, and perspire—yea, verily, do they—and even sweat. The word sweat is Anglo-Saxon, and the good and expressive Anglo-Saxon at that. It describes a natural condition, peculiar to the brickmaker, and one that is not more than half expressed by its sometimes synonymns of more delicate meaning and foreign extraction.

An ancient writer on the proprieties once uttered a warning for the benefit of the women folks of both sexes who fled from the plain expression of their thoughts to the subterfuge of foreign words that mean (in the minds of the people whose language they were) exactly what our own strong, plain and expressive Anglo-Saxon meant to the minds of those who created it and improved it and developed it. His warning said: "Remember, my dears, if you would be considered polite, that horses sweat, men perspire and ladies get in a glow."

I'll wager a brick house and lot against a brick in the hat that I could convince the old fellow that he got the thing nearly reversed; that it is men, women and horses who sweat, and under existing conditions they do, each and all, sweat most profusely, impartially, emphatically and uncomfortably, but the brickmaker it is, and him only, who has the proud and polite distinction of "getting in a glow." Nay, he does even more, he gets into two glows at once—and at the same time he sweats, sweats till the Arctic glacier thawing in a torrid sun fails to produce the slightest resemblance to the rivulets and rivers that run down his rugged sides; sweats till his suspenders are saturated and his feet are afloat in his shoes; and all the time he labors (cheerily and coolly as a snow bird in January) under the "glow" of the torrid sun and over the "glow" of the blistering kiln fires.

Sweat? Perspire? Glow? He does all, and works like a truck horse or an athlete through it all, and yet no man exists under the searching rays of old Sol or hid in far secluded shade one-half so cool to-day as he.

Ask any old brick burner who toiled over the old-fashioned kiln-fires under the hottest days, and see if he doesn't tell you that the last day he ever felt was just such a day when he thus toiled and his more affluent brother, of the shirt-waist and golf hose, hied him to the cellar, and sweat, and gasped, and wilted his collar and his shirt-waist in an agony of atmosphere creditable to the ante-room of Hades itself.

But it is a wonderful dispensation of Divine Providence, a marvelous and mysterious compensation of nature to the toiler that he sweats. He is purified in body and soul by its action. He is strengthened in brain and nerve, and muscle, and tissue by it, and if he be a very young man he finds in it that acme of all youthful ambitions and hopes, the best and quietest—nay, the only agency under Providence, that will force a moustache on a lip before its allotted time of appearing.

Sweat is a blessed word and a holy institution. "In the sweat of thy face shalt thou eat thy bread," said the Lord, and it is not strange that so many people who "perspire" never look at a brickyard without a shudder, and "get in a glow" at the mere suggestion of honest toil.

"In the sweat of thy face shalt thou eat thy bread." How pleasing to the sight of God, then, must those thousands of noble toilers in the humble brickyards of the country be! How pleasing to Him the damp of toil on the coats of my lady's roadsters, while she gets in a glow in the shade of her parasol as they whisk her through the languorous breezes.

I began this epic with the sane intention of telling the truth about a brickmaker whom once I knew, who never sweat, neither did he perspire, neither did he get into a glow such as the teacher of politeness spoke of. But I have seen his willowy form, stooped till his back caught the rays of old Sol direct, and hot as a kettle of molten metal, and his grizzled beard and ruddy cheeks seemed playing tag with the flames of the flaming arches, and his arms like automatic hooks swinging the wood from the pile into the kiln with a rhythmic motion productive of strong hypnotic conditions in the watcher. And I have seen him thus engaged through ten hours of ceaseless toil, and never in all the time was there the faintest suggestion of sweat in his appearance; and the shoes that he wore were, when the tops had been worn and burnt off about his work, as dry and clean inside as the day they were purchased, an uncontrovertible bit of proof that he never sweat; and I have seen him rise after "plugging it to" a dozen or twenty mouths and tell a tale of how himself and two men made half a million of bricks in half a season as coolly as a member of the local Ananias club in the Klondike.

As I say, I began my story with the intention of telling you the marvelous story of Bill Morrell, who never sweat or perspired, or got in a glow, when that biblical reference to sweat got me sidetracked by the swirl of the thought that if God has ordained that man should eat his bread only by the sweat of his face, what a mighty poor show there would be up in heaven for the shirt-waist man who "perspires," the eminently proper young bud who "gets in a glow," and William Morrell, of Gardiner, Maine, who did neither of these, nor sweat, yet worked as hard as ever a sweat-worn truck horse did, and lied as entrancingly as the Arabian Nights and as pensively as a Canada moonbeam.

Ah! I dread the news from the golden shore when Morrell's spirit lands, with the dull, sickening thud of the dime novels of our youth, on the slippery, shining pave of paradise, and I tremble for the men who once sweat over the fires till their boots leaked, who now eat their bread in the sweat of the face of the public.

And I commiserate the newly arrived souls of the "perspiring" and "getting-in-a-glow" multitude who never knew the blessings of rude toil, nor appreciated the strength and brick-like beauty of their own Anglo-Saxon-United States language.

THE DREAMER.

P. S.—If Morrell doesn't sweat when he reads this, I'll tell you the story—the real thing that I started out to tell—of the man who never, sweat, perspired or got in a glow.

FROM THE KENTUCKY METROPOLIS.

PEOPLE WHO KNOW KENTUCKY simply from newspaper readings are likely to have formed the opinion this year that the industry of the State now consists mostly in talking politics and trying to find out who committed murder in some days gone by, but there are lots of other people here besides those who talk politics, and, for instance, there are quite a number who make and handle brick, tiling and cement.

This old town of Louisville is a kind of conservative old lady, but things move along here in a sure and business-like manner, and this year in her building industries, Louisville, and for that matter the whole State, is likely to do a volume of work, that will dispel any idea which may have arisen as to the slowness of the country.

A recent trip through the State showed signs of activity among the brickyards at all points, signs which point to a confidence in the building prospects ahead. This is borne out, too, in other lines of building material, and the present outlook for good crops promises a fulfillment of the signs.

Locally, business is very good in all lines, is, in fact, probably better than was ever known before, and the local dealers, though many of them are rather reticent, and don't seem anxious to tell the world how good business is, admit that it is all that could be desired, and, while there may not be any marked advance in prices, there is every assurance that lots of business will be done at a fair profit.

Some good paving contracts have been let recently, but there might have been more of these if it were not for the fact that asphalt paving is a competitor in this field, which has taken a part of the proposed deals. Still, brick here has nothing to complain of; I can hardly remember seeing any brick paving here ten years ago, and now there is quite a lot of it—and more to come this year.

Mr. L. R. Figg has a contract for eight blocks, 12,000 squares of 100 feet each, which will call for some 600,000 brick and foot up a total value of $24,000. The brick entering into this contract will come from Middleport, O., but the cement and sand are the home product. Mr. Figg also has a granite contract across the river, in Jeffersonville, Ind., which foots up $5,000.

I might mention, in passing, too, that there is a very active time on in the local cement field here, but whether or not the business is being done at a high enough figure in price is another story, and some intimate that the prices are too low, but, anyway, they are doing lots of business.

Mr. "Pat" Bannon, whose lines of manufacture cover not only tiling, but terra cotta and vitrified brick, was not inclined to discuss the situation, but that there is lots of business doing he does not deny, and it is safe to say that he is getting his share of it.

Owen Tyler, who handles the product of the Mack Manufacturing Company, of Pittsburg, Pa., in enameled brick, has the largest contract for this kind of material that has ever been let in Louisville. The material is to go into four five-story buildings, which are being erected by John M. Atherton, a large distillery owner here. Mr. Tyler says the demand for all kinds of brick for building is very good, and that it is rather difficult to take care of all orders.

There is one exception which should be made to the activity in brick, and that is in the vitrified article. There is being some contracts let for paving with this, as I have said, but there is nothing like a clear field for it here, and every asphalt contract which is let is that much of a "dullness" for the vitrified article. But, then, it wouldn't hardly do to have everything coming the brickmaker's way at once, so I think we might pass over this little cloud and say that things are all right in and around the Falls City. COLONEL.

A Fine Deposit of Kaolin.

Editor Clay-Worker:

You will doubtless remember that I called at your office about a year ago and left a sample of clay which appeared to be unusually good. Well, I am pleased to advise you that the deposit has been developed and proves to be one of the best beds of kaolin in the country. You will see by the accompanying report of analysis made by your able contributor, Heinrich Reis, that it is remarkably free from impuriities. I think that in several respects it is the finest kaolin in America.

PARADISE HILL KAOLIN, MACON, GA., THE FINEST IN AMERICA.

Report of Heinrich Ries, Ph. D., of Cornell University:

	Per Cent.
Rational analysis, clay substance	99
Quartz and feldspar	1
Total	100

Physical tests: Tensile strength, 55 pounds per square inch.

Slakes rather readily in water.

Its extreme fine grain permits the entire amount to pass through a screen of 150 meshes to the inch.

The most plastic kaolin in existence.

Air shrinkage 6 per cent., on burning up to cone three an additional 5 per cent., at cone eight a little more.

Report of J. Dunraven Young, director Chicago School of Assaying, etc.:

Moisture	0.52 per cent.
Silica	45.35 per cent.
Iron oxide	Trace.
Alumina	39.75 per cent.
Calcium axide	0.25 per cent.
Magnesium oxide	0.18 per cent.
Sulphuric anhydride	0.14 per cent.
Phosphoric anhydride	None.
Loss on ignition	13.68 per cent.
Alkalies	0.38 per cent.
Total	100.25 per cent.

He claims that it is a kaolin of great purity, practically infusible in all ordinary temperatures, and the finest sample that he had ever seen. The samples were taken from close to a creek, and will probably be able to get better ones when I get up the hill. I have about fifteen feet of good clay, where opened, which shows signs of increasing as it ascends the hill.

Since we have been at work on our deposit, everybody in this section has been hunting for kaolin beds. One other mine has been developed and is now in successful operation. Another is getting ready to commence operation, and there are several others in prospect. All they wanted, it seems, is for some d—— Yankee, as they call me, to come down here and show them what they had. I am now prospecting for an asbestos mine, which I think is located on our land, and which will prove more valuable even than the kaolin. In getting out our clays we have put in steam pumps, elevators, crushers, etc., much to the amazement of the natives, who have been accustomed to do everything of that sort by hand. At first they called me foolish, but now they realize that modern, up-to-date methods pay best. Enclosed find my subscription, which I send with best wishes for the continued prosperity of The Clay-Worker. E. H. B.

Macon, Ga.

Wants the Best Kiln for Common Brick.

Editor Clay-Worker:

Having taken The Clay-Worker for a number of years, I would like to ask for some advice through its columns. What is the best low-priced kiln for burning red building brick so as to get the largest per cent. of hard brick and not spoil the arch brick and get good uniform burns. I have good mixed wood for water smoking, which costs me $3.25 a cord, and the best domestic lump coal, which costs me $2.90 a ton, with which to finish burning. This coal does not clinker. The clay is sandy and hard to burn, taking about 110 hours. We have a good market, which takes from 1,000,000 to 1,500,000 brick annually. Yours truly, D. B. CHAMBERS.

Sandusky, Ohio.

WRITTEN FOR THE CLAY-WORKER.

THE NEW YORK BRICK MARKET.

THE CLERK OF THE WEATHER is dealing out a fine class of weather, rather too fine to suit the tidewater brickmakers who operate open yards. More rain, and as a result, more rest would be acceptable these days. Remarkably hot and dry day after day, with no showers, has been the record for July. What is more remarkable is that without any wind the brickmakers are able to hack each day's output the same day. In the month of June there was one week during which each day's output was hacked. Ordinarily, the brick men think they are doing well if they can count that number of days in the whole year when they hacked brick the same day they were made, so that this year is a record breaker.

—Washed Brick—

have been very scarce so far this season. If after the machine starts a slight rain falls from a passing cloud, they stop molding that day and all men are "knocked off." No chances are taken, better a few washed than a whole pit. If smooth brick can be bought for $3.50 per thousand, what would washed brick sell for?

—Labor.—

So far this season there has been but little labor trouble among the brick men. About the only disturbance was at Fishkill, and that was of short duration. Two of the five ringleaders will have no more trouble about wages or hours. As related in last month's Clay-Worker, one of them met instant death by stepping in front of the fast express on the New York Central Railroad; another of the ringleaders, Patrick McNamara, immediately after the accident returned to the yard on which he had been working, went into the barn, and either fell or jumped from the hay loft to the floor below, where he was found later quite seriously injured, and died a few hours later at the hospital.

There is always someone on the yard to stir up discontent, and it is quite easy to tell the nationality as soon as you hear the name. The Irish are always first, with the Hungarian a close second, in breeding trouble. As soon the latter can master a few words of English, he is after more money, or strike.

The brickmaker who contracted for several millions of stock, or for all the season's output, at about $5.00 per thousand, was quite lucky. No doubt at the time such a deal was made some thought they were foolish, but as is often the case, what looks like foolish deals in the brick trade very often turn out wise ones. One party here who contracted to sell 5,000,000 brick at the above price, no doubt, wishes the contract called for more, for he stopped molding the first of August.

—Lack of Demand—

is shown by the fact that many of the brick barges that carry brick to market are not carrying many brick. One barge has been laid up for a month, and another has been laying at the yard loaded since the first of July. There is not much money in running for $1.00 per thousand freight rate, especially as the barge has to lay so long at the docks waiting for a purchaser for the cargo.

—Building Material.—

In last month's Clay-Worker it was stated there had been little change in the price of building material. If all sections have had the same reduction that the New York market has had, it must make the brickmaker wonder "if life is worth living." It seems strange the New York market should be the only one to suffer. To judge from the reports in the daily papers, all lines are affected.

The agreement between the masons and employers has at last been signed. For a number of years past this matter has been closed up about the first week in the year, and not later than the first month any way, but this year there was an ax to grind, and the matter has dragged until now. There have been rumors abroad to the effect that at a certain date contractors would reduce wages 10 per cent, and that all the members of the Exchange had agreed to stand together and see it through. The reduction has not materialized as yet, and probably will not now that the agreement has been signed.

—The Market.—

A fair test should now develop as to the market and the manufacturer. On the 12th of July, at a meeting held in Fifty-second street, New York City, the brickmakers agreed unanimously to reduce the capacity of output one-half, beginning on the 16th of July. The sheds are nearly full now, and a reduction in output of one-half ought to have a marked effect on the market price. Will the same old song of, "I only want to ship this piece of a kiln so that I can have room," be heard again, and so the market be supplied as before. As one of the signing members said, "Do you think they will stick to the agreement if brick goes up to $7.00, or even less?" "All things come to him who waits," so we will wait and see.

From January 1 to July 1 there has been a falling off of 1,752 permits, as compared with the same period last year, and the prospects are not good for any change.

The market is as steady as a clock. The following figures speak for themselves:

July 28th.	Barges.	June. 28th.	Barges.
On market	18	On market	16
Arrived during week	48	Arrived during week	41
Total	66	Total	57
Sold current week	60	Sold current week	[illegible]
In market	6	In market	9

The prices are just the same as last quotation, or as the department stores would say, $3.75 and upwards to $4.50 per thousand.

A. N. OLDTIMER.

A Voice From Texas—What is the Best Way to Work Lime Clays?

Editor Clay-Worker:

Business is fair in El Paso, but brick are cheap. There are five yards here, three steam and two hand yards, and all of them are running. The large smelting works here are using a great many brick, they have just finished a stack 150 feet high, and are building another which is to be 200 feet high.

We have trouble in producing a fair brick here, as El Paso clays all contain more or less lime and mica. Perhaps some of the contributors to The Clay-Worker who have had experience with such clays, could give information that would be of some value to us. I am sure the brick manufacturers of El Paso would greatly appreciate any information in regard to the best way to handle lime clays.

Here are a few conundrums which may interest some of the young readers of The Clay-Worker:

A brickmaker abhors bats, but he avoids kilning them.

The brickmaker is a hard case, he kilns brick, but it is better to kiln brick than time.

How can a brickmaker expect smooth brick when he hacks them?

A brickmaker is a rustler when his fires are banked.

A brickmaker may be a setter, but not a hunting dog.

In a storm the brickmaker is like a general in battle, he endeavors to get all under cover.

The brickmaker is a jolly good fellow, always setting them up.

How many corners does a good brick need? None.

With best wishes for the success of The Clay-Worker, I am sincerely yours, A. F. M.

El Paso, Texas.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

PACIFIC COAST NEWS.

THE BRICK AND TERRA COTTA business is somewhat improved and general work is now beginning to come in quite steadily. There is lots of figuring going on, the result of which will be known in the near future. Quite a number of buildings are in contemplation, both in San Francisco and outside points, and it begins to look as if trade in the clayworking lines will be very good during the coming season.

The Steiger Terra Cotta and Pottery Works are doing the pressed brick and terra cotta work on the front of the seven-story building being erected by the Deming estate, on Turk street near Market, in this city. This contract will run up to about $5,000.

Gladding, McBean & Co. report a very good trade in general work, which covers different parts of the coast. They are working steadily on the new postoffice in San Francisco, which includes terra cotta and tiling.

Considerable excitement has been caused in Hamilton, Mont., by the discovery of large deposits of fire clay within a short distance of that town. The land was discovered by J. E. Totman and P. Shannon, who have filed claims and are now endeavoring to find out the exact value of their claims. The clay has been pronounced to be first-class, and besides being capable of producing the finest fire brick, is well adapted for the manufacture of all kinds of pottery. The deposit is located four miles from Hamilton and not more than one mile from the railroad. The clay is found in inexhaustible quantities. The vein is fourteen feet in thickness and underlays the entire 320 acres located. A small shipment of the clay has been made to Anaconda, where brick will be made from it, so that its qualities will be given a practical test at once and its properties positively determined.

A discovery has been made of forty acres of kaolin, or chalk clay, at Oregon Gulch, in Shasta county, Cal. The clay is a pure white and extends down about fifteen feet, when it deepens in color. It is probable that a terra cotta works and pottery plant will be established there.

An English company is examining a kalion deposit near Nevada City, Cal., with a view of installing a large pottery manufacturing plant.

Considerable clay from the Elsinore, Cal., beds is being shipped daily to various points for the manufacture of pipe and bricks. The latest market for it is reported to be in Riverside, where a company, lately formed and having machinery now in place, is to use Elsinore clay in the manufacture of fancy pressed brick. The clay is excellent for such use and is widely known.

There is considerable activity at Burke's brickyard, at Reno, Nev. The establishment is running full blast. One kiln is now burning and another is ready to be fired. In addition to what this firm will need for its own building operations, it will burn 140,000 bricks that are already contracted for.

Pattee Bros., of Valley Springs, Cal., will put up a new fireproof brick building very shortly. Workmen will start the brickyard at that place in a few days, and will make about 200,000 bricks.

The fifth kiln built so far this season at the Weston, Ore., brickyard was fired recently. It contains 225,000 brick, and the other kilns were of about the same size, making nearly a quarter of a million brick that have been burned to date.

Ben Hager, of the Billings, Mont., Brick Company, states that the firm recently completed the burning of a kiln of 100,000 brick now being used in the erection of the Improvement Company's block at Red Lodge, Mont., and that another kiln, more than twice as large as the first one, will be burned at the Red Lodge yards this season.

The partnership heretofore existing between Guy Wyant and C. A. Scherlin, under the firm name of the South San Francisco Brick Company, has been dissolved by mutual consent. The company's yard was in South San Francisco.

Brickmaking at the yard of William Corbett, Corvallia, Ore., is finished for this season. A kiln of 250,000 is the result of the past six weeks.

The Riverside Machine Brick Company has been organized at Riverside, Cal., with C. P. Hancock, president; A. A. Caldwell, secretary, and C. Kennedy, treasurer. It is an incorporated company, with a paid-up capital of $10,000. The company owns fourteen acres of land near Fourteenth and High streets, on which the works will be situated. Their machine, which is an improved Anderson horizontal, is now in place. It will have a capacity of from 25,000 to 40,000 per day, and will be run by electricity. The brick will be burned by oil. A thirty horse power engine will be used to force the flames through the kilns. The company expects to put in a pressed brick machine later, to produce fancy bricks of all kinds.

The Pontiac Brick and Tile Company, with office at 509 Burke Building, Seattle, Wash., have put their plant in operation and have commenced shipments. The yard at Pontiac, on the main line of the Seattle International railway, near Ravenna Park, has a present daily capacity of 20,000 common red brick.

At the yards of the Missoula Brick and Tile Company, west of Missoula, Mont., Manager Hollenbeck has in course of construction a large clamp kiln, that will be used for burning pressed brick and other clay products. It is expected that this new kiln will be ready for use within a few days, and as soon as it is finished the plant of the company will be started again. Other improvements and enlargements of the plant are being planned, and will be carried into effect during the summer and fall.

Dahl & Scott, of Blaine, Wash., have recently finished burning their first kiln of brick, which is now being placed on the market.

Dexter & Son, of Wenatchee, Wash., are arranging to burn a kiln of brick. The yard has been prepared and the machinery put in position. The kiln will contain about 150,000, two-thirds of which are already spoken for.

The Washington Brick, Lime and Manufacturing Company has secured a lease on property at the corner of First avenue and Stevens street, Spokane, Wash., and will at once commence the erection of a brick office structure that will cover a ground floor space of 65x75 feet.

The first lot of brick is being burned in the new plant at Alhambra, Ariz. There is a yard full of wet brick. Some of the brick will be sent to Prescott to help rebuild the town.

San Francisco, Cal., Aug. 4, 1900. SUNSET.

A Visit to Buffalo.

Editor Clay-Worker:

I was recently "put off at Buffalo" and enjoyed a brief stay in that city immensely. Of course, I called on William H. Brush, the affable ex-president of the N. B. M. A., and was accorded the same hospitable courtesies that were extended to the members of the National Association when the convention was held there four years ago. Mr. Brush kindly invited me to accompany him to the brickyard, and I did so, of course. We drove out behind a fast trotter, of which Mr. Brush may well be proud. The drive would have been very delightful but for the condition of the asphalt pavements, which makes riding anything but comfortable.

Many of Buffalo's asphalt streets are now in anything but satisfactory condition. The citizens are certainly justified in crying a halt in laying asphalt pavements. The local papers claim that it will bankrupt the city to repair pavements that are now almost unfit for use, though many of them have been down but a few years and were supposedly constructed of the best material on concrete foundations. The taxpayers would have fared much better had they put down a good quality of brick pavements.

—At the Brickyard.—

I had the pleasure of making the acquaintance of Mr. Brush's father, a hale and hearty old gentleman of 81, who visits the yard daily and takes as much interest in the work as though its success depended upon his supervision. He has been making brick now for over sixty years. I, for one, would like exceedingly to see this venerable brickmaker at our next national convention, and to hear him discuss brickmaking problems. He could give many of us valuable pointers.

The Brushes are both enterprising and progressive. They are now experimenting with a new process of burning, by which they hope to make a further reduction in their fuel bills. As the readers of The Clay-Worker doubtless know, they have been operating a continuous kiln successfully for several years. The plant is modern and well-equipped throughout, one that it will pay any brickmaker to visit whenever opportunity offers. I certainly would not willingly miss the hearty Brush hand grasp and cordial greeting, which is extended to all brickmakers, and especially to members of the N. B. M. A. It is a pleasure to know that such good fellows are successful and prosperous. By the way, why can't we arrange for another convention in Buffalo during the Pan-American Exposition?

Johnsonburg, Pa. ALFRED YATES.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

The Chicago Brick and Building Situation.

Editor Clay-Worker:

The "Chicago Situation" is something of a chestnut. Reminds me of the boarder, when asked by his landlady, after a three months' diet of beans, as to how he liked that particular fruit, replied: "Well, as an occasional relish they are all right, but I would not care for them as a regular thing." The past month has offered no solution between the contractors and unions as to their differences. Numerous rumors as to the speedy dissolution of the Building Trades Council prevailed the latter part of July, and they proved fully as reliable as have all past rumors of the kind, as on the 27th of July Messrs. Carroll and Davis, president and secretary, respectively, of the Building Trades Council, were re-elected with practically no opposition. In the strength shown by the leaders, and their knowledge of the discontinuance by the contractors of their "Press Committee," the unions see a gain in strength, and reassert their determination to win. On the other hand, the contractors say that nothing will satisfy them but the utter annihilation of the Building Trades Council. Since the retiring of the press committee, I understand that whenever a reporter who is under penance and obliged to "do" the situation from the contractors' standpoint, he is referred to a phonograph stationed in the hall, and so long as he is willing to turn the crank, he can have this extermination policy repeated to him. In spite of unfavorable conditions, an appreciable gain in all lines of building material is credited to the past month, and while it cannot compare to the "good times" of local history, it is sufficient to warrant the material man in laying in his supply of winter coal. And this gain in material is in work remote from labor headquarters and our yellow journals, consequently less liable to interference. On all public (city) work the buildings are at a standstill. Notably, eight school buildings which have been "tied up" from three to nine months each, and no prospects of completion until after election.

President Gompers paid us a visit lately, and while he professes to cope with ordinary labor troubles, the Chicago variety, with political frills, was too much for him, and he left, a sadder and a wiser man.

Senator Hanna also made us a visit, and some of our astute Democrats tried to work him by the use of the labor agitator as a stool pigeon and the government building as a trap. Wanted the Senator to drop George Bodwell and William Manson a line to the effect that it would be agreeable, etc., if none but union labor were employed on the building that Uncle Sam is paying for. As Mr. Hanna cut his eye teeth some moons past, he was not getatable. This trip he wasn't interested in buildings anyway. Fences were more in his line. Work has begun on the Mandel building, Wabash avenue and Madison street, and our papers marvel that the excavators are not drawn and quartered by emissaries of the unions. The mystery is explained by the president of the hod carriers' union that the plodding menials are not eligible to membership in the laborers' union, but after the drudgery is done, then the unions will take a hand. The Chicago Journal took the trouble on the 2nd inst. to interview various department store managers, real estate dealers, loan men and others, and all agree that conditions were bad. Even the pawnbrokers complain of dull times. It would seem that, confronted with this condition, every effort would be made to not alone guard against future evils, but remedy existing ones, but such is not the case. There is imminent danger that the lecture field will be invaded by the champions of both factions. Already has Victor Falkenau, of the contractors' body, addressed the students of the University of Chicago on the "Narrative of the Building Trades Council in Chicago and Some of the Lessons to Be Derived Therefrom," and he is answered by O. E. Woodbury, of the carpenters' union, before the Sociology Club of the same university. It is now in order for some progressive Sorosis to make their engagements early and avoid the rush. Since the beginning of the strike contractors have insinuated that the union leaders were not practical mechanics in their respective lines; that they were "workers" only in an invidious sense; worked their associations for all there was in it, and pointed to the diminutive forearm and enlarged thorax of President Carroll to prove their assertions, and so far as Mr. Carroll's being a plasterer, some have even said that he does not know the tools of the craft; associates a "horse" to a term used in shaking for the—soda, and that the only real labor in the line executed by him was when he was a member of the Civil Service Commission and showed unusual ability as a whitewasher. This line of criticism rather worried him, and last week, finding a neighbor with a reckless disposition, together with two ceilings that needed repairing, he bargained to repair the latter. Securing two helpers, and with six reporters as witnesses, he proved his ability as a mud slinger, and in the words of the reporters: "The helpers assisting him were surprised at his skill. He set a pace at which the average journeyman would be appalled, and in forty-eight hours the two ceilings were completed, and Mr. Carroll figured a net profit of $30.00. Not working for a contractor, Mr. Carroll found there was no necessity of enforcing the rule limiting a day's work." And then Mr. Carroll spent 45 cents at Casey's, after which the reporters turned in their stent and the cause of labor was vindicated. The rash temporary employer of the illustrious leader is now conservative to a fault. Has it ever occurred to The Clay-Worker as to the prominence of the ceramic art at the present time? With the powers of the earth busily engaged in decorating China, we of the craft may well be proud of our calling. VERITAS.

Midsummer in Maine Mudyards.

Editor The Clay-Worker:

A promising but not propitious spring—now let the grammatical clayworker analyze this opening phrase in the light of what is to follow here before throwing brick bats at it—a promising but not propitious May filled the brickmakers of eastern Maine with alternate feelings of hope and disgust, and a somewhat less promising but more propitious June set them down solidly in their heel tops ready to wrestle with the worst that fate had in store. This was followed by a July with no promise for future markets, but with the most propitious brickmaking weather that could possibly be manufactured.

Everything was late this last spring excepting orders for brick, and the rain and the tax collectors. Winter lingered in the lap of spring until June turned the hose on it and chased it out with a long-continued shower bath. Inquiries for brick in May found none on hand and no immediate prospect of early kilns. Yards that a year ago had their first kilns burned in May and June, this year came trailing along the last of June and July with new brick. Prices have held up well—never at any time reaching a fancy figure—but now, with no very brilliant outlook, there is no falling off in prices, and for this reason it is absolutely impossible in what remains of the season to accumulate a dangerous surplus. So far the yards in Bangor and Brewer have turned out some 3,500,000 to 4,000,000, of which one-half remains. The sales have averaged $6 per thousand net.

Wages in the mudyards have ranged about as low as last year, from $30 to $35 per month and board for old hands, and $26 per month for green hands.

In the Kennebec Valley somewhat more of a boom character prevails. Waterville and Augusta are doing considerable building, and the brick industry there shows the advantage in having brickyards operated by the contractors. Two prominent firms of contractors in the Kennebec Valley monopolize the brickyards, and when a practical builder, who is also a practical brickmaker, finds it unprofitable to operate his brickyard it is certainly a dull season, and labor is surely suffering outside as well as inside the yards.

In Somerset county, Johnson & Johnson, contractors, are turning out about 800,000 brick, which they intend to lay in buildings in that town this year.

The Hancock county yards are doing a little more than an average year, with men's wages a little below the average.

Hosea B. Phillips, the Ellsworth brick monopolist, is operating but one of his two yards, and will turn out about 800,000, half of which will be used in the vicinity of his yard, the balance to find a market, probably in Bar Harbor and vicinity. Mr. Phillips pays his men $26 to $30 per month, and claims he has the best brickmakers in Maine. His bricks net him about $6.50 per thousand.

The Orland and Penobscot yards are running about two-

thirds force. Messrs. A. W. & A. B. Hutchins, the most conservative brickmakers in Orland, went in with full crews in the spring after looking the prospects over, and they say that, while the market has not held up to the level of its early promise, that they are confident that it will easily digest the surplus between now and next spring.

To these yards of Orland and Penobscot, as well as Portland, Soer, Biddeford and other yards, the rehabilitation of the Brick Trust is a matter of deep interest, as their main market still continues to be Boston and in territory that will be directly affected by the imposition of the combination. These manufacturers, however, though they may not be asked to join the trust, look to it with feelings of hope, for better prices rather than a menace of unpleasant prospects.

A great many of the features of the plan commend it to every brickmaker, whether within the territory or out. An agreement to hold prices to a living figure, rather than a practically unanimous design to cut, is the one long-felt want wherever two brickyards in any time ever got within competing distance of each other.

Maine brickmakers will not put so much money in bank this year as they did last, but they are all assured of a fairly decent sum profit in the wind up.

Anders Persson, who is making himself and eastern Maine famous as the only proprietor of a pottery in this section not controlled by a syndicate, and as a progressive manufacturer of various classes of clay wares and of unequaled emery wheels, and unique methods of manufacturing all, has awakened a great deal of interest here in his latest venture in raising pigeons for the Boston markets.

Mr. Persson fell into the undertaking through his kindly disposition. His love for God's dumb creatures led him to care for the birds that gathered under the eaves of his great pottery.

Soon the doves had swarmed to almost incredible numbers. They crowded themselves out of house and home, though not out of food, for the master kept them well supplied. But a thinning out of the number soon became imperative, and Mr. Persson conceived the idea of dressing some for market. He was astonished at the prices his Boston commission merchant got for his pigeons, and the size of the order for a fresh consignment. Should it continue as rosy as it begun, Mr. Persson may yet consider the advisability of converting his big pottery into a huge dovecot. B. J. DUNN.

Buffalo Briquettes.

Editor Clay-Worker:

July was rather quiet in the building line in this city. Sales only about three million for the month—just about half the usual amount required for this market. Some of the yards have laid off one gang in preference to wheeling out. I am told Brush Bros. have laid off three gangs, but their yard is in better shape to work the year round should occasion require—no other yard here is equipped for cold weather. This firm has six Martins, one Hercules and one Wellington machine. They have a very large dry shed, with racks and a fan to blow the hot air from a coil of pipes through them. They have four down drafts, seven or more up drafts and a fourteen-chamber Wilford continuous kiln, and a rated capacity of 22,000,000—the largest yard in the association.

The Star Brick Co., at Lancaster, has settled all their financial difficulties, and is working again under the control of E. H. McCutcheon, former president of the concern. They still retain Fred Haake as superintendent. They have two Hilton machines, up-draft kilns; have torn out Sharer dryer; output about four millions—just enough to fill the quota. Another benefit of having an association. The Lancaster Brick Co., while not making any brick, are turning out large quantities of hollow brick and drain tile, and report demand very good—better than one year ago. This firm has a superintendent, a German, only about a year in the country. He has some advanced ideas in brickmaking. He says we are forty years behind the times in this country. He was brought up on his father's yard, where he learned all the practical part; then sent to a school or college, something like Prof. Orton's, I should judge, where he finished his education in clay products. He understands the clay at the bank, the working of it by the stiff mud process, setting, firing, burning, is an excellent draughtsman, is an an up-to-date, all-round brickmaker. His plan for a brickyard is a building of sufficient size to have the engine, boiler, machine and a continuous tunnel kiln, all under one roof, with cars to dry the brick on and from the heat of the kiln. It seems to me it would be a money saver if the scheme worked all right, and he claims it has in Germany.

J. F. Stengel, who formerly owned a brickyard on Grand Island, and after it was burned down, turned his attention to building dryers throughout the country, claims business is so dull in that line he quit and went into the lumber business. He is located in Ellicott square, and reports trade exrellent. Our Pan-American is using millions of feet, the buildings are rapidly approaching completion, the white staff is being put on, and the grounds, shrubbery, lily ponds, lakes, Venetian canal and pallisades are being pushed along as fast as possible. Twenty-five hundred men are at work on the grounds, and still there is lots of work to be done before next May. Chas. Berrick's Sons have the contract to build the State building (permanent), to be afterwards occupied by our Historical Society; it is to be built of white marble and brick; appropriation was $300,000.

The Allbright building, for an art gallery, will also be permanent, of white marble and brick, and located on the hill, near the Park lake and just opposite the State building. They will both add materially to the park attractions.

Buffalo, N. Y., Aug. 13, 1900. NORTON.

Good Opening for Experienced Brickmakers.

Editor Clay-Worker:

The San Francisco, Brick Co. has recently made many improvements in their plant, and are at present in a condition to give employment to a number of first-class brickmakers.

We will employ four first-class kiln setters to work in our continuous giant kilns, five chamber men to load wagon, must understand brick, two men for pugging clay for machines. Two experienced men for handling cores, must also understand cutting clay by the wire process. Two men with A No. 1 references as burners to burn our continuous kilns; these men must be active and practical and understand burning thoroughly. We burn with coal and oil. We also want three pan feeders who understand mixing clay in dry pans. Two practical burners for glazing sewer pipe, men who have had experience with salt-glazing brick and understand our burning process. One pressman and one first-class branch sticker, who thoroughly understands his business. These machine men must be familiar with machinery from pan to press.

The plant of the San Francisco Brick Co. is situated in the heart of the city and is the most healthy place for men to work all the year around, being noted for its delightful weather. Men working at outdoor positions do not get the extremes of the weather.

One thing must be understood thoroughly by all applicants for above position. They must be in good physical health, as our experience has been very unpleasant with men from "The East" whom we have engaged and who upon their arrival were unable to fill position, owing to ill health. Let it be understood, they must come here to work, as heretofore mentioned, and will be paid the best of wages. Men desiring particulars, can address Mr. R. South, care San Francisco Brick Co., with reference from parties by whom they were last employed, and in what capacity.

Trust you will give the above a place in the August Clay-Worker, for we realize that the best way to get before the clay-workers of the United States is through the columns of The Clay-Worker. Truly yours, SAN FRANCISCO BRICK CO.

San Francisco, Cal., August 6, 1900.

Not in the Trust.

Editor Clay-Worker:

Our attention for some time past has been repeatedly called, by responsible parties, to a statement (having its origin with competitors of ours), that the works now owned and operated by this corporation, for the manufacture of vitrified salt-glazed sewer pipe, has been absorbed by a later company or passed from under our control. We take this opportunity to announce that no sale of the plants owned by this company for the manufacture of sewer pipe, has been under consideration or is contemplated, and that we shall continue offering, in the different markets, products of superior quality, under our own corporate name. Yours respectfully,

UNITED STATES CLAY MFG. CO.

Pittsburg, Pa.

Got His Money's Worth.

Publishers Clay-Worker:

It is with great pleasure I ask you to drop our advertisement from your magazine. I have sold and delivered the machine advertised and have been deluged with letters in regard to it. You have more than earned your money. Yours very truly, CHAS. F. SHUSTER.

Norwood, Pa., uly 30.

WRITTEN FOR THE CLAY-WORKER.

SUMMER MEETING OF THE CERAMIC SOCIETY.

THE SECOND SUMMER MEETING of the American Ceramic Society occurred Aug. 1 to 3, at Niagara Falls, N. Y., under the pleasantest surroundings, perfect weather and with an attendance of about 30 per cent. of the entire enrollment of members.

The members of the society enjoy these summer outing trips so much that they have become already determined to make them a fixed part of the year work of the society. The first, held at Cleveland, Put-in-Bay, Akron and Barberton, was a most emphatic success, and when the announcements for this year's meeting were delayed a few weeks, such a volume of inquiry and outcry was raised as to effectually prove what position the summer meeting held in the minds of the membership.

—Early Arrivals.—

The members began arriving about twenty-four hours before the meeting. When the secretary arrived on the field, early Wednesday morning, he found Messrs. Bloomfield and Ferguson already hobnobbing together, and as the day wore on the circle was constantly widening, as one after another of the familiar faces appeared. It is a noticeable and refreshing fact about these "Keramikers" that they all know and like each other and that they begin at one meeting exactly where they left off at the last. There is no strangeness, no breaking the ice, no getting "limbered up," so to speak. The minute two of them see each other, they go to work talking into each others faces and using hands, eyes and pencils to supplement their flying tongues in the eager interchange of idea and experience.

Thursday morning, at 9 o'clock, the procession started out on its scheduled round of visits. First, they boarded the cars for the great "Gorge Route" round trip, running across the suspension bridge to the Canadian side, up to the Horseshoe falls, where they disembarked and spent a half hour in watching the sublime downpour, the grandest on the globe. No one wants to talk much while looking at this awesome, yet beautiful, vision. Its magnitude, its deadly power and awful energy repress levity in all but the most flippant, while even the most thoughtless soul, in considering the gigantic results achieved by this yielding, soft and mobile fluid, which is itself dashed to mist and spray by the least opposition, but which in turn has excavated miles of this great gorge through hard, dense limestone, must draw a wholesome lesson as to what continued effort, however weak and futile in the abstract, may accomplish in this world of ours.

—As Others See Us.—

Once more on the trolley, tongues loosen up and the air resounds with a medley of ceramic lore. Seger, atomic weights, monosilicates, down-draft kilns, porosity and decalcomanic decorations are blending into a vertable jargon, and the other passengers are in doubt as to whether it is safe to stay on the car or not. One fat man seems specially nervous and announces it as his opinion that "the asylum officials ought to be more careful about the way they permit the worst wards to go off together like that and with so few attendants; it isn't safe for the inmates, nor the public." No one knows who the attendants are, but, inasmuch as the fat man's eyes are fixed upon Burt and Zimmer, who are engaged in a hot argument on the subject "Blisters," we all feel that they at least are exempt from suspicion of being anything but "inmates."

As we pass the whirlpool and look into its sullen, circling current, talk and badinage again ceases for the moment. At the monument erected in honor of General Brock's victory, we tell Burns we will excuse him while he goes up and takes a look at it, but he responds with his usual aptness, that he is now an American, and if we don't enjoy looking at it, he wouldn't either; whereat we all pat him on the back.

At Lewiston, the small boys with fruit to sell descend on our party like the tourists of old on the Egyptians. No one knows what might have happened if Bloomfield hadn't been along, but his purchases relieved the tension and enabled the car to get safely away. At the whirlpool rapids, on the American side, the party halted again and looked long and admiringly at the incessant, rushing, tumbling mass, always the same, but never alike for a second. Our pride in American push and energy grows greater as we recollect that only a few years have elapsed since these wonders have been within the reach of thousands from the seats of a trolley car.

—A Modern Wonder.—

Returning to the International, the party takes lunch and before they have had time to light the post prandial cigar, the indomitable secretary is urging them to get under way once more. This time it is to the power-house of the Niagara Falls Power Company, and here, through the kindness of Mr. Lincoln, the party is most thoroughly inducted into the wonders of the great plant. Looking at the water running quietly out of the discharge end of the tunnel, near the falls, one cannot realize that it has yielded the energy and working power of 35,000 horses, since we saw it flowing gently and quietly through the canal above the Falls. But as we descend into the wheel pit, where the great turbines are filling the air with their "Syrens" and we see the mammoth pipes delivering the water to them and look for a moment into the fury of the escaping floods, as they dash out from the wheels on their way to freedom again, we are willing to believe whatever we are told. A special treat has been reserved for us by Mr. Lincoln, who takes us into the "Lightning" room, where the lightning arresters for the power lines to Buffalo are located, and after carefully marshalling us into a compact group, away from dangerous proximity to any of the numerous "live" wires, he shows us the wonderful phenomena of artificial lightning produced by a current of 40,000 volts. The display was beautiful, but not a little terrifying, and as the party emerged from the ozone-charged air of the room many drew a long breath of relief. When one reflects that only 500 volts is used in street cars and less for most industrial uses, the novelty of what was shown us may be better appreciated.

Reluctantly leaving the wonders of this monumental establishment, we move on to the Carborundum Company's plant, only a few blocks distant. Here we are shown the details of the manufacture of this wonderful abrasive, from its crude constituent materials, coke, sand, sawdust and salt. The final product is the carbide of silicon, or a union of the elements of carbon from the coke and silicon from the sand, while the salt and other ingredients act as fluxes to facilitate the progress of reduction. The process is carried on in electric furnaces, using low tension currents of enormous volume, and the temperatures attained are unknown; they are certainly far beyond direct measurement.

The shining mass of brilliant plate-like crystals, colored every hue of the rainbow by some obscure oxidation product as they cool, makes a beautiful sight, but one cannot help being disappointed at the comparatively inoffensive appearance of one of the furnaces then on full blast. It looks like a big mound of damp dust, banked up in a long ridge, with brick walls at either end, into which the wires carry the current. It is hard to realize that under this black covering is a temperature at which the eye could no more look than at the sun itself.

The superintendent, Mr. Tone, then showed us a more familiar object—the kilns in which his wares were finally put into marketable condition. It seems that this carborundum, after being once formed, is a very permanent compound, even to heat. Its ingredients, carbon and silicon, both burn with great energy in other combinations, but welded together by this ter-

rible temperature, they become almost inert to outside influences. So in manufacture, the crystals are crushed, sized in grades from the finest flour to the coarsest sands, mixed with clays and fluxes, fashioned into grinding wheels, of every shape and size from the minute dental buzzer up to large machine-shop tools, and finally converted into hard, durable products by burning exactly as other clay wares.

Equipped with beautiful little souvenirs, in the shape of a pocket-knife sharpener, and with generous lumps of the wonderful carborundum crystals themselves, to a great box of which Mr. Tone kindly gave full access, we bid this hospitable establishment farewell and returned to the hotel, tired but delighted.

—Getting Down to Business.—

In the evening a session was held for business matters and committee reports. Among other things, the committee on Seger reported less than 100 pages remaining untranslated and stated that a few months would see the matter in the hands of the publisher.

The committee on equivalent weight submitted its final and revised report, in an elaborate eighty-page pamphlet, entitled "Manual of Ceramic Calculation," which, it is hoped, will be the means of greatly assisting the struggling ceramic workers of the country in their efforts to advance their work from an empirical to a scientific basis. The volume was ordered copyrighted before issue, and will be sold at $1.00 per copy, and can be had from Treasurer S. G. Burt, Rookwood Pottery, Cincinnati. The committee, of which Mr. Burns was chairman, was given the warm thanks of the society for this great contribution to the society's literature and for the possible revenue which its sale may bring in.

The secretary presented the society with proofs of the forthcoming volume of the transactions, No. II, which were also ordered copyrighted before issue to the membership. The price of this volume, which contains 280 pages, including the Manual, was set at $4.00 per copy to persons not members of the society. Members receive one copy free, but will pay $2.00 for extra copies.

—Members Elected.—

New associate members were elected as follows: Owen Carter, partner in firm of Carter & Co., Encaustic Tile Manufacturers, Poole, Eng.; John W. Hasburg, dealer in and manufacturer of ceramic supplies, 588 Fullerton Ave., Chicago, Ill.; Alfred Yates, superintendent Johnsonburg Vitrified Brick Company, Johnsonburg, Pa.; Wm. H. Powell, manager Excelsior Terra Cotta Company, New York, N. Y.; George A. Stanbery, manager American Encaustic Tile Company, Zanesville, O.; William Cannon, superintendent Courtney plant of Tempest Brick Manufacturing Company, Courtney, Pa.; William H. Jungi, head draftsman, Northwestern Terra Cotta Company, Chicago, Ill.; Dr. George C. Britton, Star Porcelain Works, Trenton, N. J.; C. William Whitehead, manager Providential Tile Works, Trenton, N. J.; Dr. C. H. Land, manufacturer of dental furnaces, Detroit, Mich.

Several other applications, which are pending, were not received in time to be acted upon at this meeting. The total membership of the society has now reached 66, a growth of 65 per cent. in the last year.

The following morning, after an early breakfast, the party left at 6:30, over the New York Central, for Syracuse, N. Y., to visit the plant of the Onondaga Pottery Company, of which Mr. James Pass is the presiding spirit. After the active work and late hours of the day preceding, a four-hour ride was quite acceptable to the members, who at once proceeded to gather into little knots of twos and fours and to utilize the time in visiting.

—Visiting the Onondaga Pottery.

Arriving at Syracuse at noon, a halt was made for lunch, after which a generously large carry-all took the entire party out through Genessee avenue to the pottery. This street, arched over by noble old elms and lined with velvet lawns without a fence in sight, is one of the most beautiful in the country and well worth a trip to see it alone.

At the pottery Mr. Pass speedily made the party at home by his cordial welcome, and after a few moments' visit the tour of the works was begun. Every department was thrown open without reserve, and the details explained. The keenness of the interest of the party was evidenced by their searching questions and the frequent halts for discussion and argument as points in the experience of one or another was suggested by what was shown. The beautiful quality of the wares was conceded by all, and certainly no more competent band of critics could well be found than those who were present.

The greatest interest probably centered in the new department for the manufacture of decalcomanic decorations, both for under and over glaze work. The Onondaga Pottery Company is at present the only pottery in the country making this class of decorations for themselves and the process was most interesting to the visitors. The process has been perfected by Mr. Pass, only after a long and expensive period of experimenting, and is now in a high state of efficiency and is turning out work equal or superior to the best French establishments, with whom it comes chiefly into competition.

After viewing the plant an informal but most delightful discussion was had in the company's office over some of the phenomena which had come to notice on this trip, in which Mr. Pass proved himself a most skillful debater, as well as successful potter. He received the warm thanks of the society for his kind reception and the facilities for observation extended.

The meeting broke up at Syracuse, the members scattering to their various trains as the evening advanced.

—The Value of Personal Intercourse.—

It may be something of a surprise to clayworkers and scientists generally that an association composed of such men as form the roster of this society should hold a regular formal meeting with absolutely no programme in the way of papers or addresses. The experience of this society has shown and abundantly proven that what makes the scientific or technical society chiefly valuable is not the papers and addresses and literature brought out in meetings, as is commonly said by the stay-at-homes, "What is the use of paying a lot of money to hear them read in a noisy hall when, a few weeks later, you can read them far better in the quiet of your own study or office?" But the fact that these worthies absolutely overlook is the personal transfer of information and inspiration which accompanies these meetings. Most societies recognize this as a powerful factor, but few go boldly to the limit and say that this inspiration alone is sufficient. We need nothing else to justify us in leaving our work and spending money in going to these meetings.

The summer meeting is now pretty well established in this society as the occasion for learning to know each other, and by contact and by observation to acquire ideas from the plants of other ceramic and allied industries. The winter meeting is for the formal interchange of opinion by debate and papers on the technical problems of the day. Each meeting is of incalculable value and neither can be spared.

All's Well at Rome.

My Dear Mr. Randall:

Find our check for amount due on subscription to The Clay-Worker.

You ask for a line on the outlook, and comparative figures with last year. We have less orders for common brick at this date than we had for the corresponding date of last year, but our orders on fine face brick are far better than ever before. We are having plans drawn for the sixth kiln of the Eudaly patent, which will hardly answer our purposes.

Our best trade on fine brick has been through the Carolinas this season, though, Georgia, Alabama and Florida hold up well. Prices on common brick about 10 per cent. less than this date year ago, but we have not reduced the face brick.

Taking all the conditions that confront us, the trade is far better than we had reason three months ago to believe.

With my best wishes for your continued health and prosperity, very truly, H. H. McCLURE,

Rome, Ga., July 24. Secy. and Treas. Rome Brick Co.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SEVENTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIV. AUGUST, 1900. No. 2.

CURRENT COMMENT.

Inasmuch as the eyes of the whole world are now focused on the Flowery Kingdom, our readers will find the article on another page entited "Chinese Ceramics" of absorbing interest. The almond-eyed heathen may be a poor fighter, but his brick and tile structures prove him to be an adept clayworker.

* * *

Those of our readers who are interested in roofing tiles (each and every one of them ought to be, for clay roofing tile is unquestionably the best of all roofing materials) will find our leading article this month both entertaining and instructive. There are valuable thoughts and suggestions in it, too, for the student in other lines of clay work.

* * *

We remind the young readers of The Clay-Worker that now is the time to determine on the course of schooling to be taken the coming fall and winter. Those who are desirous of becoming educated, scientific clayworkers can readily achieve their ambition by a course in the Ceramic Department of the Ohio State University, which will begin another school year early in September. The cost of attendance is nominal, considering the advantages offered, which include every facility known to modern educators. Prof. Edward Orton, Jr., Columbus, Ohio, will be pleased to give full particulars to those seeking information.

* * *

A Western subscriber asks for advice relative to the placing of a fire risk on his brickyard, stating that the companies represented by local agents decline to take the risk. This is not a rare occurrence, we are sorry to say, nor is it strange that insurance companies are averse to accepting brickyard risks, for the flimsy manner in which brickyards are built make them extra hazardous. For this reason, when policies are written, the premiums are excessive, so much so that brickmakers are prone to grumble at the cost and to charge the insurance companies with extortion. So long as they persist in building their plants so largely of inflammable materials there is little, if any, hope for relief. The way for brickmakers to get cheap insurance is to build their plants as nearly as possible of brick. If they will do this and roof their buildings with clay tiles, they will have little or no trouble to obtain good insurance at moderate cost.

BRICK BUILDING AT THE HUB.

It now appears that Boston is doing more brick building than any city in this country. Within that municipality brick buildings now outnumber frame buildings by more than two to one, and the building regulations in that city are now more stringent than in any other city in the United States. Boston has had a great building revival within the last year, and a large number of buildings of a high class are now being constructed. An article in the Boston Herald states:

"The builders realize that wood, by reason of natural decay and the necessity for repairs, is the most expensive material that can be used in building, and that brick and stone, beside requiring no paint, will remain in place for many years."

Captain Damrell, the Building Commissioner, is quoted as saying that when building materials, such as brick and stone, resume the place they occupied before the war and other causes raised their prices, the use of commodities having fireproof qualities will have the ascendancy.

FIRE INSURANCE RATES AND EQUITIES.

The question of insurance rates should be a question of construction. The best constructed building should have the lowest rate of insurance. This has not hitherto been the case. In this city there is well constructed fireproof buildings, which under ordinary circumstances would resist the attack of fire from the outside. No fire which would originate in that building could possibly destroy it or even cause serious loss. However, from its exposure fire might work in through the windows and cause certain loss, but certainly not its destruction. Its destruction by fire appears to be an impossibility. However, when the insurance rate is made, the companies have required a rate of fifty cents. "Why, our building is entitled to a better rate than that," says the owner. "Your building is all right," says the insurance inspector, "but you have an exposure. Next to you is a paint store and near you is a very poor and a very weak building. Your rate is made on the basis of the exposure."

This is wrong. Every building should carry its own risk. Not alone to the property which it contains, but also to the risk which it entails to the adjacent property. If we have a paint shop next to a steel-constructed building, we should pay not alone what risk is on our own property, but as well that which we entail on others. Some one may say that this is theoretical; that it has not been worked out in practice. This is not true. If one lives in an apartment in France, or if he occupies a store in a building, he takes out three grades of insurance. One wherein he asks indemnity for loss on his own property; another wherein he asks indemnity against loss which he may entail on others in the same building which he occupies, and another wherein he secures indemnity against loss which we may cause to others who are adjacent to him in other buildings as the result of a fire which starts within his property and premises. This is logical, just and right. If a fire originates within our building, within our apartments or within our business property, we are or should be responsible for the damage which we cause to others in the building or in adjacent property. The refinement of justice and the refinement of insurance is found in France, where people are responsible for the loss which they may cause to others and wherein they may secure indemnity from such loss by those who are in the insurance business. Where one is next to the paint shop, as before stated, he should not be expected to pay insurance on property

with which he is not concerned, but under the regulations in this city and other cities of this country, he does pay insurance on his exposure, all of which is manifestly unjust. The exposure should, and does where the idea of insurance is carried to its ultimate perfection, pay a rate upon the property which it endangers. It now seems that insurance companies are beginning to look at this thing in a rational way and that in time it will be arranged on a rational basis.

THE ASPHALT PROMOTER AND HIS VICTIM.

Evidently an editor of an Illinois paper has been the victim of an asphalt promoter. He labored through nearly two very long columns with the thought that brick pavement cost double that of asphalt. Evidently he has had it poured into one ear by one man. Some of the worst streets that have been put down in the world have been of asphalt. On the whole, the most expensive pavements have been of asphalt. The best and the cheapest pavements have been of brick, not but that poor pavements have been made of brick, but the best pavements have not been made of asphalt, and the best and cheapest have been made of brick. The most enduring, the most satisfactory, the cheapest, the longest-lived pavements which we have in this city have been made of brick. Poor pavements have been made and can be made with any material, the best pavements can be made of brick and the best pavements cannot be made of asphalt. That is the result in this city. The asphalt combination, with the powerful syndicate behind it, with the strong central organization exploiting this material, has been enabled to secure strong support all over this country. The manufacturers of brick-paving material, divided into infinitesimal disorganized number of units, has suffered because of its division and lack of organization. This has been the weakness of manufacturers of brick-paving material and the centralization of the manufacturers of asphalt, independent of the material used, has been its strength.

COMPARATIVE RATES OF INSURANCE.

Rates of insurance in various countries are instructive. We give below a statement taken from the "Rationale of Fire Rates," by Mr. A. F. Dean, and published by Mr. J. M. Murphy, of Chicago:

"It is in the power of the constituted authorities to abolish fire insurance; but it is not within their power to compel the sale of indemnity at less than cost. Laws cannot lower rates, but may do much to lower cost. Once lower the cost, and competition will lower rates."

A comparison of existing laws and the average loss on each one hundred dollars of fire insurance in different parts of the world shows that—

In France the loss on each $100 is about	$0.06
In Great Britain the loss on each $100 is about	.09
In New York the loss on each $100 is about	.58
In Massachusetts the loss on each $100 is about	.60
In Texas the loss on each $100 is about	1.10
In Arkansas the loss on each $100 is about	1.31

The average loss in Arkansas and Texas is about twice as high as in New York and Massachusetts, thirteen times as high as in Great Britain, and twenty times as high as in France.

The official statistics show that for the eighteen years ending January 1, 1898, the net underwriting profit or loss for each dollar of premiums received by the companies in the States named has been as follows:

	Net loss.	Net profit.
In New York	....	$0.05
In Massachusetts	....	.03
In Texas	$0.02	....
In Arkansas	.01	....

While the average underwriting profits of England and France are not obtainable for camparison, the business of those countries is free from the wide fluctuation in loss ratio which has made it so hazardous in this country, and underwriting profits have been small, but uniform, at rates which seem amazingly low from an American standpoint.

A SERIOUS BUT NOT FATAL ACCIDENT.

Our daily papers of July 18 announced with startling headlines that "The venerable editor of the Drainage Journal" had been very seriously and probably fatally injured by being thrown from a street car at 6:30 that morning. He confesses to having been pretty badly shaken up, but enters a general denial to the balance of the story. He doesn't consider himself venerable and expects to continue the daily grind and to mingle actively with friends and neighbors for several years to come.

The accident which came near terminating Mr. Billingsley's career was one of those unaccountable occurrences which come in the hurly-burly of daily life, and well illustrates the uncertainty of human existence, and brings home to us with fearful force the importance of so ordering our daily life as to be prepared for the final call at any time.

Being in a hurry to catch a train, Mr. Billingsley "touched the button," and, taking it for granted that the car would stop at the next crossing, stepped out on the running board in order to step from the car as soon as it came to a stop. The conductor did not heed the signal bell, and, instead of slowing up, the car sped on even faster than before. The speed was so great and unexpected that it carried Mr. Billingsley off his feet and he was thrown violently to the brick pavement, alighting on his head. It is really remarkable that he survived the shock, but we are very glad to say that after a fortnight's confinement to the house he is again in a normal condition, save an additional "bump of caution," which will, we hope, enable him to avoid any similar experiences in the future.

ART IN MANUFACTURING.

In the manufacture of clay products the techinal has passed the art. Clay products, from a technical and manufacturing standpoint, are certainly as perfect as the time demands. From an artistic standpoint, however, there is yet much that is wanting. The suggestion as to this comes from the architect who looks at buildings from a strictly artistic standpoint. He no longer wants the perfectly formed brick, those which have the most uniform color or the smoothest surface. We know of many buildings wherein paving brick have been used for pretentious structures. We know of others wherein brick which have been pitted by rain while drying, thus making their surfaces spotted and irregular, have been used in prefernce to those absolutely uniform in color and perfect in form. Why is this true? may be asked. The absolutely smooth brick, those which are absolutely perfect in form and uniform in color, have not fulfilled the demand. Herein are two extremes. One wherein the very smooth, the absolutely uniform brick, have been made and used, and the other where those which are rough and not uniform in color have been selected. Both are extremes. Neither is right in all cases. There is a demand, of course, for what is known as the perfect brick. The perfect brick from a technical standpoint has been made. The brick which is absolutely satisfactory from an artistic standpoint is variable. The brickmakers of the country have all but bankrupted themselves in making a technically perfect brick. The artistic element has been largely neglected. There has been too much of mechanical perfection and not enough of artistic development. No one can say who is responsible for this. The architect, who is rarely an artist, usually demands a mechanically perfect brick. However, no one who looks at the building wherein these smooth, uniformly colored, and, we may say, sandpapered brick are used, finds satisfaction in the result. In this city there has been made a grade of common red brick, which have been sold at approximately the same price as the

brick that have been used in the ordinary wall construction. These brick have been laid with phenomenal skill, which has been excelled no place in this country. The result has been that very few red pressed brick have been sold in this city, for the very good reason that the common brick laid as well as they have been, and with such consummate skill, have been more satisfactory, not alone to the architect, but conspicuously to the public. The result is that, excepting where there has been a preference in matter of color, this has been a very poor market for red pressed brick. In truth, there has been no reason why red pressed brick should have been used in any building in our city, because of the splendid character of the common brick and the masterly manner in which they have been laid. There is something in the texture of these common brick, something in the surface which they present—a richness, a warmth—which appeals not alone to the eye or the artist, but as well to the public. It is probably true that the technical side of brickmaking has gone to seed and that the artistic side has measurably been neglected. Certainly this is true when we consider the decorative forms which have been presented to the public, by this we mean the moulded brick. Most of the forms have been crude and ugly. In a few instances this has not been true, but generally speaking, we are sorry to say, that in making these moulded and ornamental forms, mechanical, rather than artistic, excellence has been considered. We are sure, however, that the selection of rough brick and rain spotted brick is a fad, and it has a happy medium between a brick which is so smooth and so slick that a fly cannot sit on it and that which is so rough and crude as to be all but ridiculous. There is a difference between overrefinement and overcrudeness.

AN IMPORTANT MATTER.

"The Swift slack coal coking table furnace kiln continues to grow in popularity," writes F. E. Swift, the inventor, and as corroborative evidence he is sending out a neat little pamphlet headed, "Our July Testimonials," embracing commendatory letters received during the month of July from fifteen representative firms, of which the following from the well-known firm of fire brick manufacturers, whose name it bears, is a sample:

Bolivar, Pa., July 10, 1900.

F. E. Swift, Esq., Washington, Iowa:

Dear Sir—We are pleased to state that we are using your furnaces in fifteen of our kilns at the present time. We have placed them in all the new kilns that we built the last year, and have remodeled several, placing your furnaces in them. They produce a good heat, require less labor and fuel, and burn a little quicker than the ordinary furnaces. Yours respectfully,

REESE-HAMMOND FIRE BRICK CO.
J. B. Hammond, Treas.

Those who wish to reduce their fuel bills and burn better brick are requested to address Mr. Swift on the subject. See his ad. on page 152.

IMPROVED MACHINERY AND APPLIANCES WANTED FOR AN UP-TO-DATE POTTERY.

We have a small plant here at Catlettsburg, Ky., where we are making stoneware, flower pots, etc. We wash the clay, dry it by steam pipes in vats, and then temper it with a pug mill, which is not very satisfactory. I am now contemplating putting in some new machinery. However, this would only be temporary, as we will soon move out to a new plant. We, of course, want to put in the process that would produce the best ware. Our clay is free from pebbles, but contains some sand. Would be glad to have some information as to the best process to adopt. K. B. CECIL.

Several desirable plants are offered for sale in our "Wanted For Sale, Etc." columns. It will pay those of our readers who are looking for favorable locations for the establishment of clayworking plants to investigate these establishments. It is sometimes much wiser to buy an established business than to undertake to build anew.

THE NEW YORK STATE SCHOOL.

The State School of Ceramics, at Alfred, N. Y., is an accomplished fact. An interesting and comprehensive circular has been issued, and work will be begun with the fall term on September 11.

We notice that the work of the school is arranged so as to fall in with the courses in Alfred University, so that the students of ceramics will gain all the prestige of a university education and will reap the advantages accruing from study with a large and expert faculty.

In the circular before us it is stated that the demand for the school arose from a threefold consideration—the undeveloped resources of the State in clays and shales; the vast importation of artistic pottery; the need for training men to deal with these two points. There is no doubt that the position is well taken. New York State lies close to the large Eastern centers of consumption of clay wares and does not begin to produce all she needs, but it is in the second consideration that we look for the greatest development. Not only in New York City, but in every city and town, even in every china store throughout the land, the enormous preponderance of imported china must be apparent. Germany and France, England and Austria, China and Japan pour their wares into America, and there is but little native attempt to stay the flow or to supply the demand. This should be changed, and we are glad to know that the school at Alfred will make an effort to change it.

In Prof. Charles F. Binns the management of the school have probably secured the best man in the country to deal with this particular phase of the question. Prof. Binns has had a long and severe training in the production of fine wares in England, and has, moreover, made a special study of the historic and artistic aspects of the potter's art. He brings to the work the traditions of a well-known name and the experience of two lifetimes, for he has had his father's work and learning to draw upon.

At this season of the year, when parents are looking around for openings for the boys who have left the high schools and taken a vacation, we cannot do better than advance the claims of Alfred University and the School of Ceramics.

We have taken some trouble to find out what manner of place this is, looking at the question as if we were about to send our own boy.

The village of Alfred—population about 1,000—is located in Allegany county, in western New York. Lying in a beautiful valley, some 1,800 feet above sea level, it is surrounded by wooded hills and smiling farms. The college dates from 1836, when it was founded as a seminary of the Seventh-day Baptist community. Later it was incorporated as a university and is still controlled largely by the same religious body. Full liberty, however, is allowed. Several of the professors belong to other persuasions, and less than half the students are of the original belief. At the same time, the village has a wholesome religious tone. There is neither saloon nor policeman within its precincts, and it is said that no lawyer can make a living there. It is a place, in fact, where parents may fearlessly intrust their young men and maidens—for Alfred is co-educational—the only apparent danger being that of mutual attachment.

The buildings of the university are well equipped for the work of education. There is a fine library and spacious class rooms. Laboratories for chemistry, physics and biology, an observatory and two boarding houses meet every requirement, and it would be difficult to find between Maine and California a place better suited to the training of young people in an atmosphere of culture and refinement.

To this is now added the State School of Ceramics, and the students of this school will become ipso facto students in the university.

Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

THE ORIGINAL SHIRT-WAIST MAN.

Las' Saturday, when I'd druv in to Barber's giner'l store,
Some drummer throwed a paper down an' left it on the floor;
And the very fust thing I see when its pages I did scan
(I got them fine words from a book) wuz, "Lo, the shirt-waist man!"

I read it through and then I found that all this row and fuss,
An' big headlines and roarin' type was jist because some cuss,

Some city jake, with 'bout the sense of Hiram Jinnin's shoat,
Hed gone an'eat his daily grub 'thout puttin' on his coat!

"The 'riginal shirt-waist man," they says, says they, "at last has came!"
An' I allow, fer a city dude, he showed thet he wuz game,
But if the Jacob Townsend goods they really want to see,
Jist let 'em come to Plunkville town an' take a look at ME!

—Robley D. Stevenson, in Indianapolis Press.

THE INDIANA STATE FAIR.

Exhibit at Indianapolis, from September 17 to 22—Scope of Fair Broadened and Premiums Increased—Many New Features—The Corn Show.

The Indiana State Fair will be held at Indianapolis this year from September 17 to 22. Many of the plans for this autumn event are now complete and others well in hand. The success of the fair last year, when the attendance for the week, and the number and variety of exhibits were greater than in any of the preceding forty-six years that the exhibition has been held, has caused the State Board of Agriculture to broaden the scope for this year, the departments having all been expanded and the premiums increased that there may be still more xhibits and addeed interest for the visitors. The premium lists that are now being distributed show that nearly every class in every department has been enlarged. The board is making its greatest effort this year to enlist the interest of live-stock exhibitors.

—The Cattle Exhibit.—

In the beef cattle classes the premiums have been more than doubled, and will amount to $3,000, of which $1,500 is offered in the short horn classes alone.

—The Sheep Exhibits.—

The Shropshire sheep men are taking unusual interest in the State Fair this year. The premiums to be awarded are larger than usual, and, in addition to those from the State Board, a number of special ribbons will be offered by the American Shropshire Registry Association.

—The Corn Show.—

The prospects are that Indiana will this year have an enormous corn crop, one that is greater in volume than the State ever knew before. This prospect gives encouragement to the undertaking of the State Board to give a corn show during the fair on a scale in every way broader than has ever been attempted. The Indiana Corn Growers' Association has joined with the fair management in this enterprise, and the corn show will be a leading feature.

—Lectures.—

Mrs. Rorer has been engaged to deliver a series of lectures on cooking, household economy and other subjects in which the ladies are interestd.

—Races.—

The racing programme this year is one that will attract a high class of horses. There will be races on four days of the fair, three races to start each afternoon.

—Special Attractions.—

The State Board is planning for numerous special features that have never been seen before at the fair that will be announced in advance of the opning date.

TABLE OF CONTENTS.

Tiles in Nature 95
Roofing Tiles..... 97
In Philadelphia Brickyards.... 98
Button-Hole Talks..... 99
Vitrified Brick Pavements in Philadelphia 100
A Brickman on His Rambles.. 102
This Brick Business in New England..... 104
Brickmaking in Hoosierdom .. 105
Frit Kilns 106
Philadelphia's Pavements 107
The Right Man in the Right Place 107
The Brickmaker is Made, not Born..... 108
A Great Ohio Brick Plant 109
Good Times and Some Hobbies 109
Seger Cones; are They Practical 110
The Russian Brick Industry... 112
Busy Tilemakers..... 113
Fire Brick: Their Manufacture and Uses..... 115
Chinese Ceramics..... 117
By the Light of the Kiln Fire.. 118
Summer Meeting of the Ceramic Society..... 124

CORRESPONDENCE.

From the Kentucky Metropolis 119
A Fine Deposit of Kao in 119
Wants the Best Kiln for Common Brick 119
The New York Brick Market.. 120
A Voice from Texas..... 120
Pacific Coast News..... 121
A Visit to Buffalo 121
The Chicago Brick and Building Situation 122
Midsummer in Maine Mud-yards 122
Buffalo Briquettes..... 123
Good Opening for Experienced Brickmakers 123
Not in the Trust..... 123
Got His Money's Worth..... 123
All's Well at Rome..... 125

EDITORIAL :

Current Comment..... 130
Brick Building at the Hub 130
Fire Insurance Rates and Equities..... 130
The Asphalt Promoter and his Victim 131
Comparative Rates of Insurance 131
A Serious But not Fatal Accident 131
Art in Manufacturing..... 131
An Important Matter 132
Improved Machinery and Appliances Wanted..... 132
The New York State School... 132
Editorial Notes and Clippings. 136

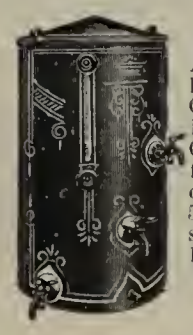
MISCELLANY:

Theory leads Progress..... 96
Cause of Fires 97
Carelessness Causes much Loss 101
Brickyard Comics..... 108
Importance of Trade Papers... 109
A Relic of War Times Causes Trouble in a Brick Plant 110
One Crank's Views of Vacations 115
The Original Shirt-Waist Man. 133

Index to Advertisements on Front Inside Cover Page.

Hot Weather Orders. While a great many manufacturers are finding midsummer business quiet enough to take vacations, orders for the

Cross Oil Filter



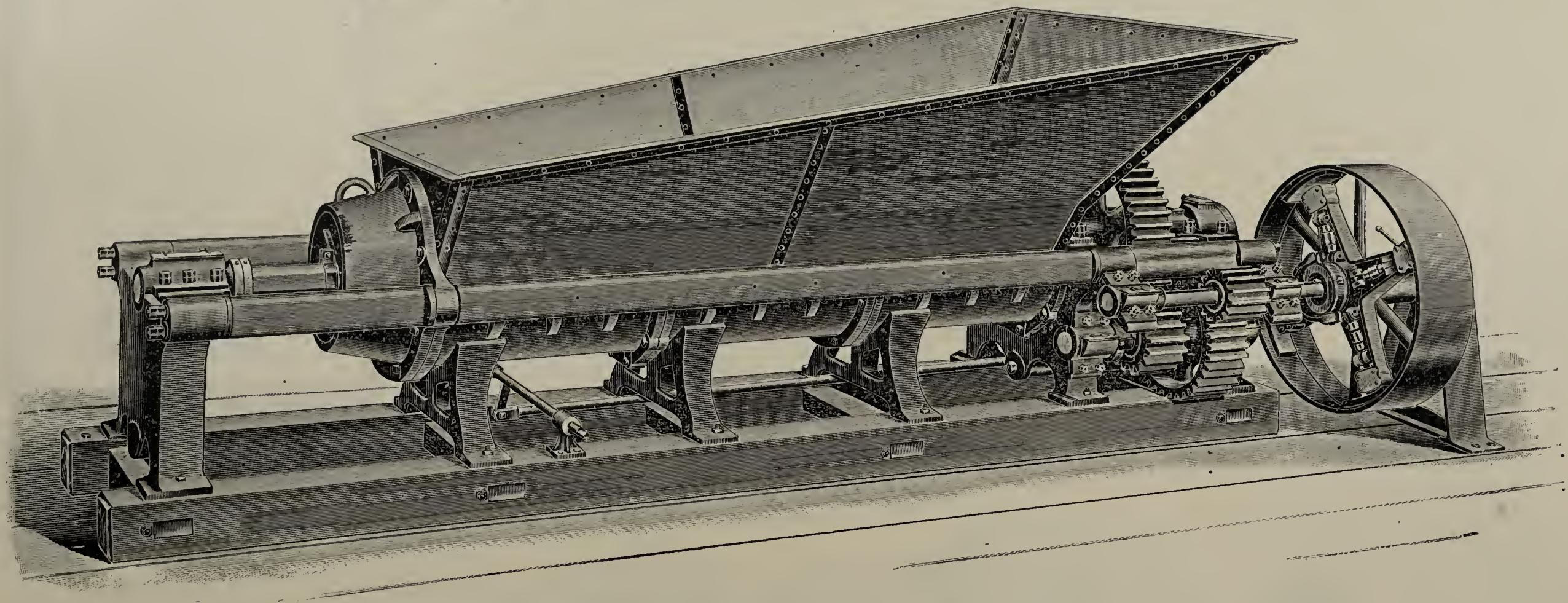
Are coming from all over the world. We have just made important shipments to Copenhagen, Denmark; Stockholm, Sweden; Madrid, Spain; Paris, France; London, Eng.; City of Mexico and smaller orders to other foreign ports. Our domestic trade is also quite up to the mark. Our guarantee to save 50% of oil bills brings business regardless of seasons. Sent on approval and freight paid both ways if not satisfactory. Catalogue 43.
We also make the BURT EXHAUST HEAD.

The Furt Mfg. Co., Akron, Ohio, U. S. A.

Largest manufacturers of Oil Filters in the World.

A Clay Granulator that will Granulate Clay,

IS WHAT WE OFFER YOU.



Raymond Ten Foot Clay Granulator.

We also build a full line of Auger Machines, Automatic and Hand Cutting Tables, Automatic and Hand Re-presses, Pug Mills, Dry Pans, Wet Pans, Clay and Ore Separators, Soft Mud Machines, Mold Sanders, Barrows, Trucks, Cars, Tempering Wheels, Molds, Engines and Boilers, and in fact everything required on the brickyard.

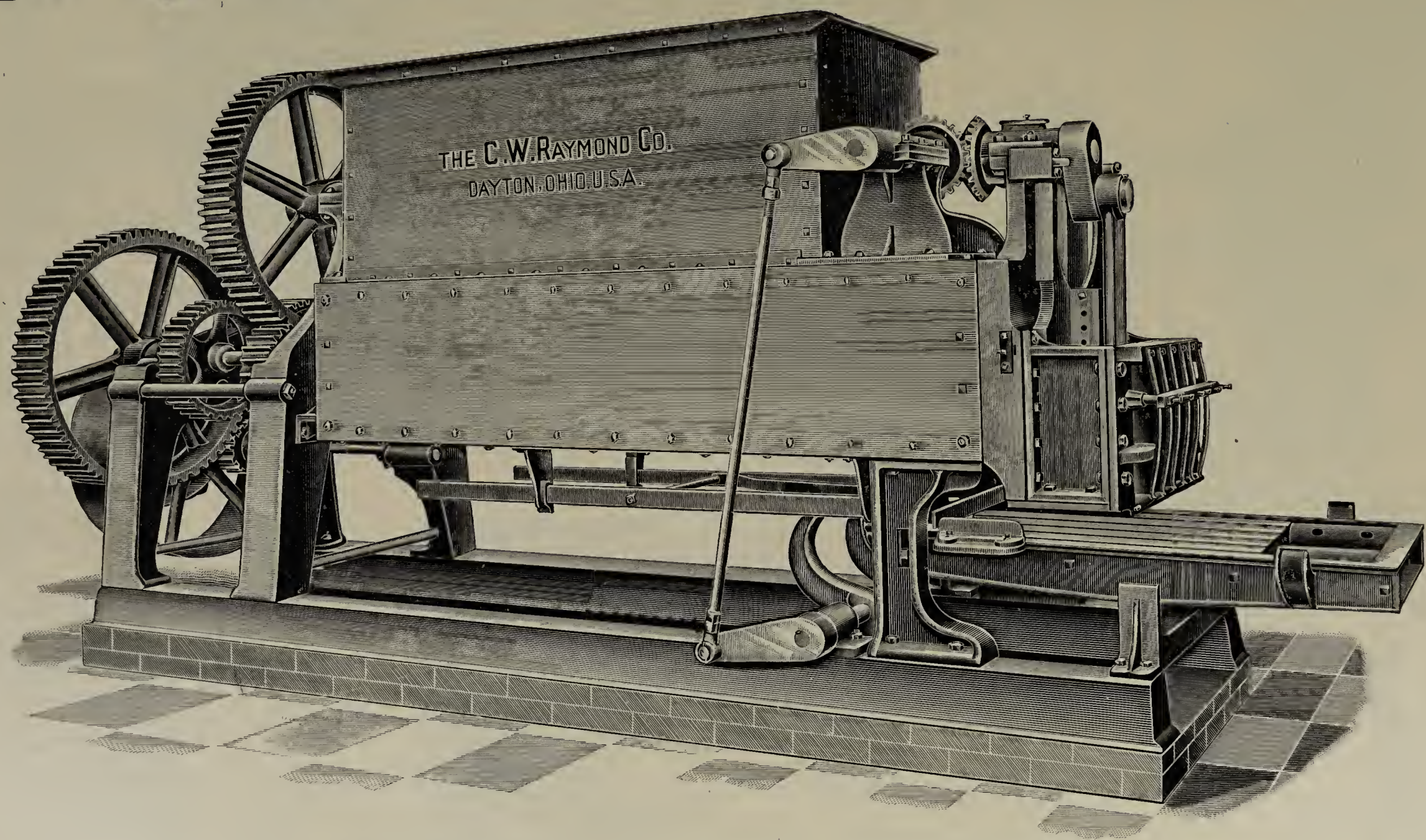
Send for our new Catalogue.

The C. W. RAYMOND COMPANY,

Dayton, Ohio, U. S. A.

AHA! HERE WE HAVE IT.

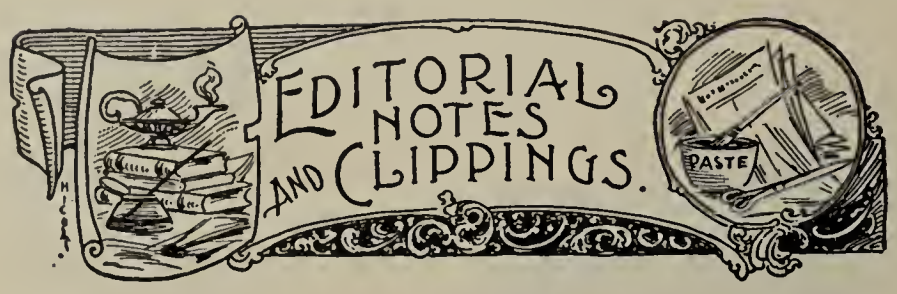
JUST WHAT YOU HAVE WANTED FOR YEARS.



The Raymond No. 1 Horizontal Stock Brick Machine.

The LATEST AND GREATEST SOFT MUD MACHINE ON THE MARKET. Weighs 18,000 lbs. All Iron and Steel. Working parts few and heavy. No springs, weights, triggers or cams. Compound geared. Maximum pugging capacity. Will press brick soft or stiff. Minimum wear. Molds fully filled out and all brick alike. Capacity 30,000 to 60,000 brick per day. Just the thing for fire brick yards or those where a heavy duty machine is required. Send for description.

The C. W. RAYMOND COMPANY, Dayton, Ohio, U. S. A.



H. Guilbert, of Westville, N. H., will erect a brickyard at Plaistow, N. H.

J. A. Steinberger, has leased the Chenoa (Ill.) tile factory from J. C. Houck.

John Slater, of Madrid, Iowa, contemplates starting a brickyard at Slater, Iowa, soon.

The Branch Brick Co. has been incorporated to manufacture brick at Greensburg, Pa.

Moseman & Weber have purchased W. H. Carlisle's hollow brick and tile plant at Clay City, Ind.

Fire damaged the Hooper Brick Co.'s plant at Bridgewater, Mass., to the extent of $1,200 recently.

August Froelich, a retired brick manufacturer of Sheboygan, Wis., died at his home in that city recently.

E. C. Stewart will put in a large steam brickmaking plant at Bartow, Fla., where he has extensive clay deposits.

I. O. Keener, of Middletown, Pa., has purchased the brick plant of Hummel Bros. & Rhoads at Hummelstown, Pa.

James Laurie, of Scranton, Pa., is looking for a suitable location for a brick plant, as the clay is giving out at his present plant.

H. H. Warren and J. B. Kirkbride have purchased a tract of land at Massena, N. Y., and will at once begin the erection of a brickmaking plant.

T. H. Martin's brick works at California, Pa., was burned to the ground. The loss is estimated at $3,000. The plant will in all probability be rebuilt.

The Valley Coal Co. is installing brickmaking machinery at its plant, near Bay City, Mich., where they will manufacture ornamental and paving brick.

The Washington (Ohio) Brick Co. has been incorporated by A. C. Warne, O. S. Chalfant, J. S. Forsythe and others. They have a capital stock of $20,000.

The Copperville Brick Co. is the name of a new concern at Raleigh, N. C. A plant is to be established that will have a capacity of 50,000 brick per day.

The South Webster Fire Brick Co., South Webster, Ohio, report a splendid trade. The year 1900 is one of the most prosperous years in their history.

The Fultonham (Ohio) Brick Co. are making some tests in burning with gas in order to ascertain whether it will pay them to use that fuel instead of coal.

The office of the brick works of R. M. Matson Sons & Co., Falls Creek, Pa., was destroyed by fire the morning of August 1st. The origin of the fire is not known.

Clarksburg, W. Va., is to have a new brick plant, with a capacity of 100,000 brick daily. Charles B. Ebert and others, of Parkersburg, W. Va., are the promoters.

The Anness & Potter Fire Clay Co. has been incorporated at Woodbridge, N. J., by Louis C., Anna M. and Lewis E. Potter and F. F. Anness. Capital stock, $100,000.

McAdams & Mitchell's brick plant, at McCook, Neb., was burned July 24. The plant will be rebuilt at once. The fire is supposed to have been caused by incendiaries.

The Mississippi Glass Co., of St. Louis, Mo., has purchased the large fire brick and clay plant at Vandalia, Mo. The work will be enlarged and put in working order at once.

T. M. Stevenson and James A. Bickford have purchased 900 acres of fire clay land near Lock Haven, Pa., on which they contemplate erecting an immense fire brick plant.

Walter Leslie, former assistant postmaster at New Castle, Pa., will go to Pueblo, Colo., the first of September, where he will take charge of the American Brick Co.'s plant at that place.

The Battle Creek (Mich.) Brick and Tile Co. has been incorporated by Henry Starr, Levi Fowler and H. K. Haak, with $10,000 capital stock. They will manufacture brick, tile, terra cotta and pottery.

The tile factory of John Brison, at Millersport, Ohio, was completely wrecked by an explosion. Mr. Brison was badly hurt and two ladies who were passing the plant in a buggy at the time were also injured.

The United States Pottery Co., at Wellsville, Ohio, was almost completely destroyed by fire on the 6th inst., causing a loss of $25,000. A large stock of finished ware ready for shipment is included in the loss.

The Nonesuch Fire Clay Co., of Empire, Ohio, will add a sewer pipe plant to its brick works. They have recently purchased some land adjoining their brick works, which they will utilize for the sewer pipe plant.

A cave-in which occurred at the clay bank of the Imperial Brick Works, at St. Louis, Mo., buried four of the employes. Three of them got out all right, but one was killed, nearly every bone in his body being crushed.

William C. Hilton, the well-known brick manufacturer of Dunkirk N. Y., was quite painfully injured recently by a cow running its horn into the corner of his eye. We sincerely trust the injury may not prove serious.

Edward Ford, manager of the new glass company recently organized at Toledo, O., says the company contemplate putting up a brickyard for the purpose of manufacturing the brick to be used in the erection of their immense plant.

We are advised by Meier & Burlingame, of Byron, Mich., that their brick plant was burned July 30, destroying all the machinery, sheds, etc. They estimate the loss at $5,000. Insurance, $2,000. They will probably rebuild at once.

Carl R. Ickis, manager of the Denver Fire Clay Co., Denver, Colo., died August 8 of typhoid fever. Mr. Ickis had been with the company since 1891, and was a young man of exceptional promise. He leaves a wife and a large circle of friends.

Hugh P. Wilson, a pioneer brick and sewer pipe manufacturer of Collinsville, Ill., died at his home in that city July 20, after an illness of but three days. Mr. Wilson was 63 years old and had resided in Collinsville for fifty years. He leaves a wife and four sons.

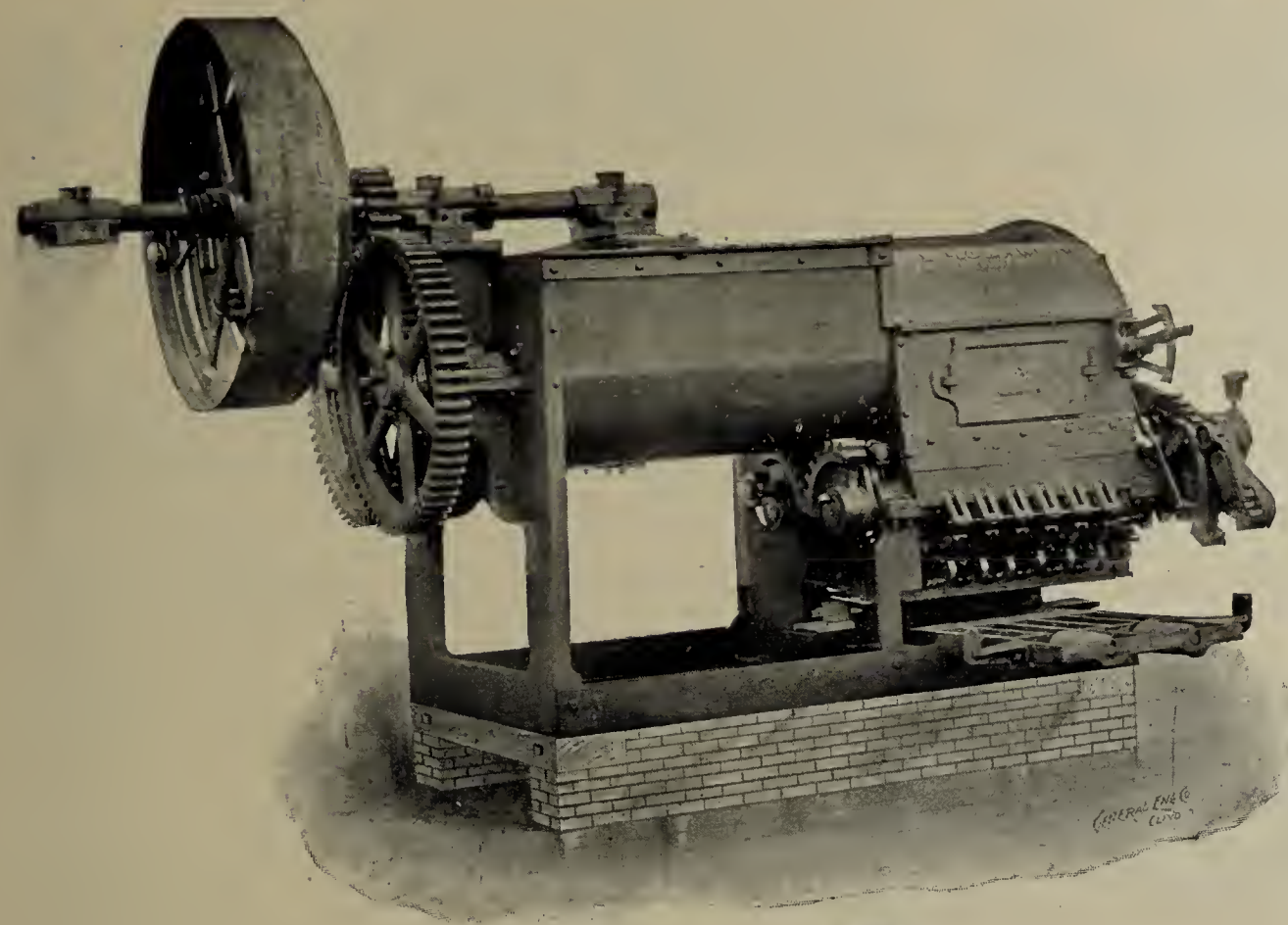
A severe wind and rain storm which struck East Brookfield, Mass., caused considerable damage at the different brickyards. At the Boucher Brick Co.'s plant 150,000 green brick were ruined, and the Caron brick plant and the Commonwealth Brick Co. suffered a similar loss.

The Geijsbeek Pottery Co. is the name of a new concern that has been organized at Golden, Colo., with a paid up capital of $50,000. The officers of the company are H. B. Patton, president; W. H. Whitehead, vice-president and treasurer; J. B. Geisjsbeek, secretary, and S. Geijsbeek, general manager.

While Charles M. Long, an employe at the Sayre & Fisher Brick Works, at Sayreville, N. J., was repairing some machinery, the engine was started by a misunderstanding and Mr. Long was struck on the head by one of the arms of the machine and instantly killed. The deceased was 55 years old and leaves a family.

The Kansas City Vitrified Brick Co. has been organized at Chanute, Kan. The directors of the company are G. L. Northup, H. E. Yockey, J. C. Carpenter, A. B. Hedrich, J. B. Beatty, F. H. Huston. The officers are: President, G. L. Northup; vice-president, A. B. Hedrick; secretary, E. E. Ward; treas-

[CONTINUED ON PAGE 138.]



Over 75 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

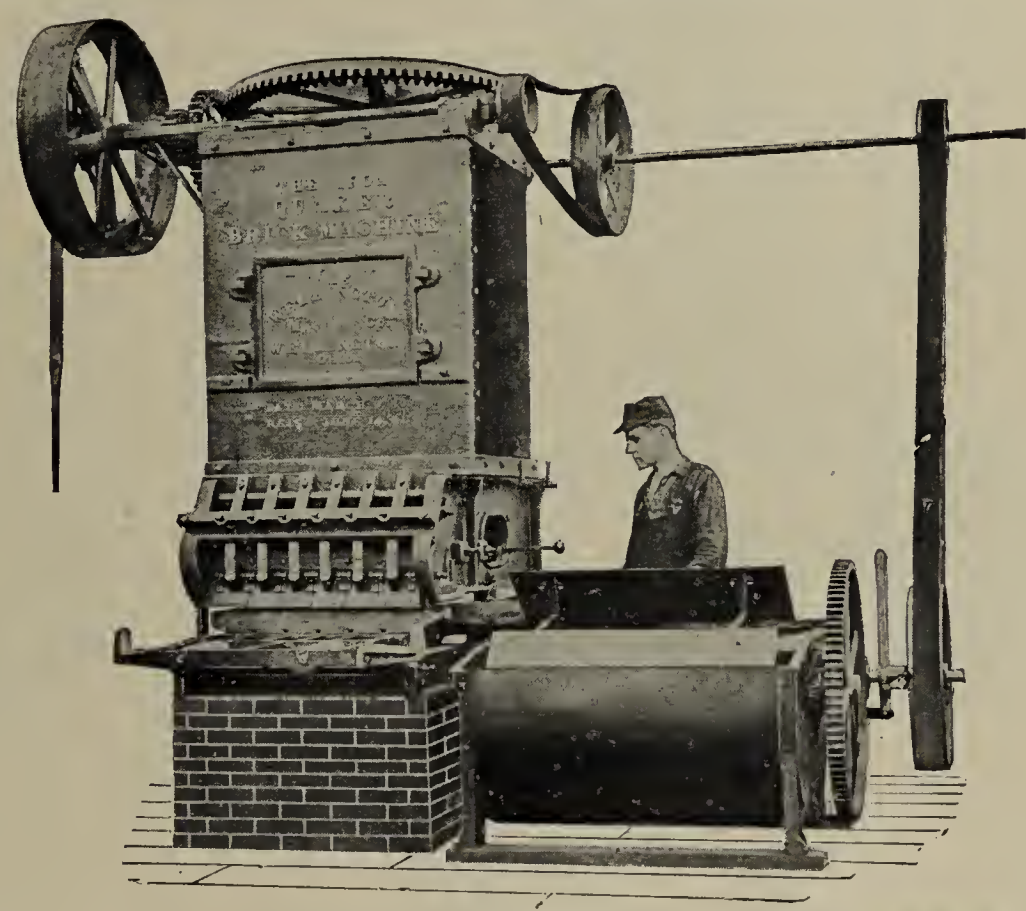
Long acknowledged the best for small and average sized yards.

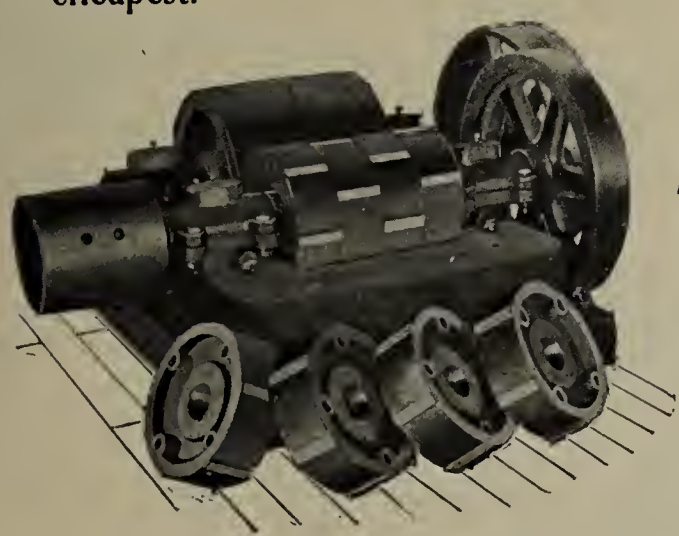
FOR 1900

We have added several new machines to our line.

Send for our 1900 Circulars.

Our mould-sander is the best, simplest and cheapest.

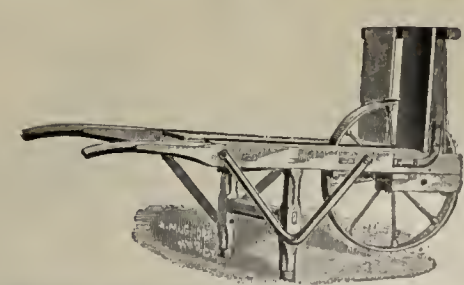


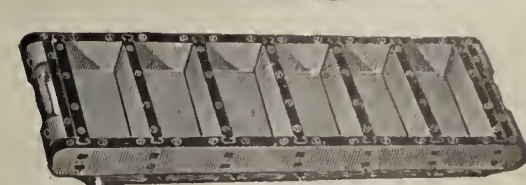


TWO Styles of Disintegrators, Solid rolls with inserted cutting bars and cutting roll made of hard sections.

MOULDS, TRUCKS, BARROWS,

and all other Supplies.





Nothing runs easier than our BALL-BEARING BARROWS AND TRUCKS.

The WELLINGTON MACHINE CO.,

WELLINGTON, OHIO.

EDITORIAL NOTES AND CLIPPINGS—Continued.

urer, G. N. Lindsay. This is a strong company and they own an immense bed of fine shale and three of the best gas wells in the district. They will push the business from the word go.

The Burt Manufacturing Company, of Akron, Ohio, have made some important shipments of their cross oil filters on export orders in the past month. These orders come from Denmark, Sweden, Spain, France, England and Mexico. Notwithstanding the unsettled condition of Europe, their export business is steadily increasing.

The Hannibal (Mo.) Press Brick Co. report that they are doing an immense business. They now have orders for all the brick they can make the balance of the year, and it may be that they will be compelled to increase their capacity in order to supply the demand. They recently booked two orders which call for 2,000,000.

The Riverside Machine Brick Co. has been organized, with C. P. Hancock, president; A. A. Caldwell, secretary, and C. Kennedy, treasurer. It is an incorporated company, with paid-up stock of $10,000. The company owns fourteen acres near Fourteenth and High streets, Riverside, Cal., where the works will be located.

The huge iron smokestack at the works of the Chester (Pa.) Brick Co. fell to the ground recently. While the damage to the plant was not great, work had to be suspended for some days. Fortunately no one was injured. We would mildly suggest that if the company would build a brick smokestack, a recurrence of such an accident could be avoided.

The firm conducting the Wehn Brick Works, at Johnstown, Pa., will in the near future be known as the Bruce H. Campbell Brick Co. Mr. Campbell has been managing the brick plant, and will now be president, while Mr. E. M. du Pont will be manager and secretary. They will put in new machinery and the daily capacity will be increased to 30,000.

Parry Bros. & Co., North Cambridge, Mass., report a very busy season. They have recently received a large order for their celebrated "Harvard" brick to be used in the new Horticultural hall in Boston. They are constantly receiving large orders for these brick from New York City, Philadelphia, Baltimore, Buffalo, Chicago and one late order comes from Wisconsin.

The plant of the Drury Brick and Tile Co., at Essex Junction, Vt., sustained a heavy loss by a fire which visited their plant last month. The town has no fire department, but the seventy-five employes, together with a number of the citizens, formed a bucket brigade, and so confined the flames to the engine and boiler house and one of the machine sheds. The owners estimate their loss between $5,000 and $10,000. When running on full time the plant has a daily capacity of 100,000 brick. The burned portion of the plant will be rebuilt as rapidly as possible, as there are a large number of orders on hand.

J. F. Harris, manager of the Maroa (Ill.) Brick and Tile Co.'s plant, writes that they are tearing down their plant and going out of business, as the members of the company have become interested in other lines. He says Maroa is a splendid place for a good man to locate a brick plant, as the clay is good and there is a good local demand for a first-class building brick.

A fire at Royersford, Pa., which started in a large dye house, spread to the vitrified brick works of Lewin, Thomas & Co. and the brick sheds of Allen T. Keely. Lewin, Thomas & Co. suffered a loss of $10,000 as their plant was almost completely destroyed, while Mr. Keely's loss was but $1,000. Both firms were heavily insured and the work of rebuilding will be begun at once. The origin of the fire is unknown.

John Roffers, of De Pere, Wis., in a recent letter, says: "Brick business in this section has been rather slow. Prices are from $5.50 for machine-made brick to $6.00 per thousand for sand-molded brick. We will only run a short season in order to lessen the output and so maintain prices. I put in a Potts horizontal machine this spring, and I want to state it is the best machine we have ever used, and we have used a number of different machines."

John Spahr, a well-known brick manufacturer of Carlisle, Pa., died July 31. Mr. Spahr was born in Carlisle in 1832, and has been connected with the brick business since he was 13 years old until six months ago, when he retired from active business life on account of failing health. In commenting on his death a local paper says: "As a business man he was energetic, honest, and reliable, and popular among his fellowmen. In the home he was a loving and attentive husband and father. He was sympathetic and kind to those oppressed, and in his death Carlisle loses a good citizen." The deceased leaves a wife and four children.

While grading for clay the men at Flanagan Bros.' brickyard, Second street and Lydia avenue, Kansas City, Mo., excavated a number of large bones, some time ago. They were examined with interest by the men at the time, but were afterward thrown aside and given no further thought. Recently, more bones were unearthed by the men, this time including a large, white, round bone resembling very much the tusk of a large elephant. The attention of M. C. Long, curator of the public museum, was called to the affair, and he made a visit to the brickyard. After carefully examining the bones, Mr. Long stated that there was every reason to believe that the men had unearthed part of the skeleton of one of the species of elephant now extinct known to geologists as a mammoth, a species of mammal. The long, round bone, he said, was the elephant's tusk and is solid ivory. He thinks that the skeleton was probably deposited there during the glacial period, thousands of years ago. Flanagan Bros. have donated the skeleton to the public museum, where, when it is excavated, it will be on exhibition.

WHY MR. COUNTRY BOARDER IS HOME AGAIN SO SOON.

MR. COUNTRY BOARDER—"I'll tell you, this change from the canned truck of the city to the fresh, green, country vegetables has made me feel like a boy again. I'll bet I could jump that fence."

(The police department won't permit us to print what Mr. Country Boarder said.)

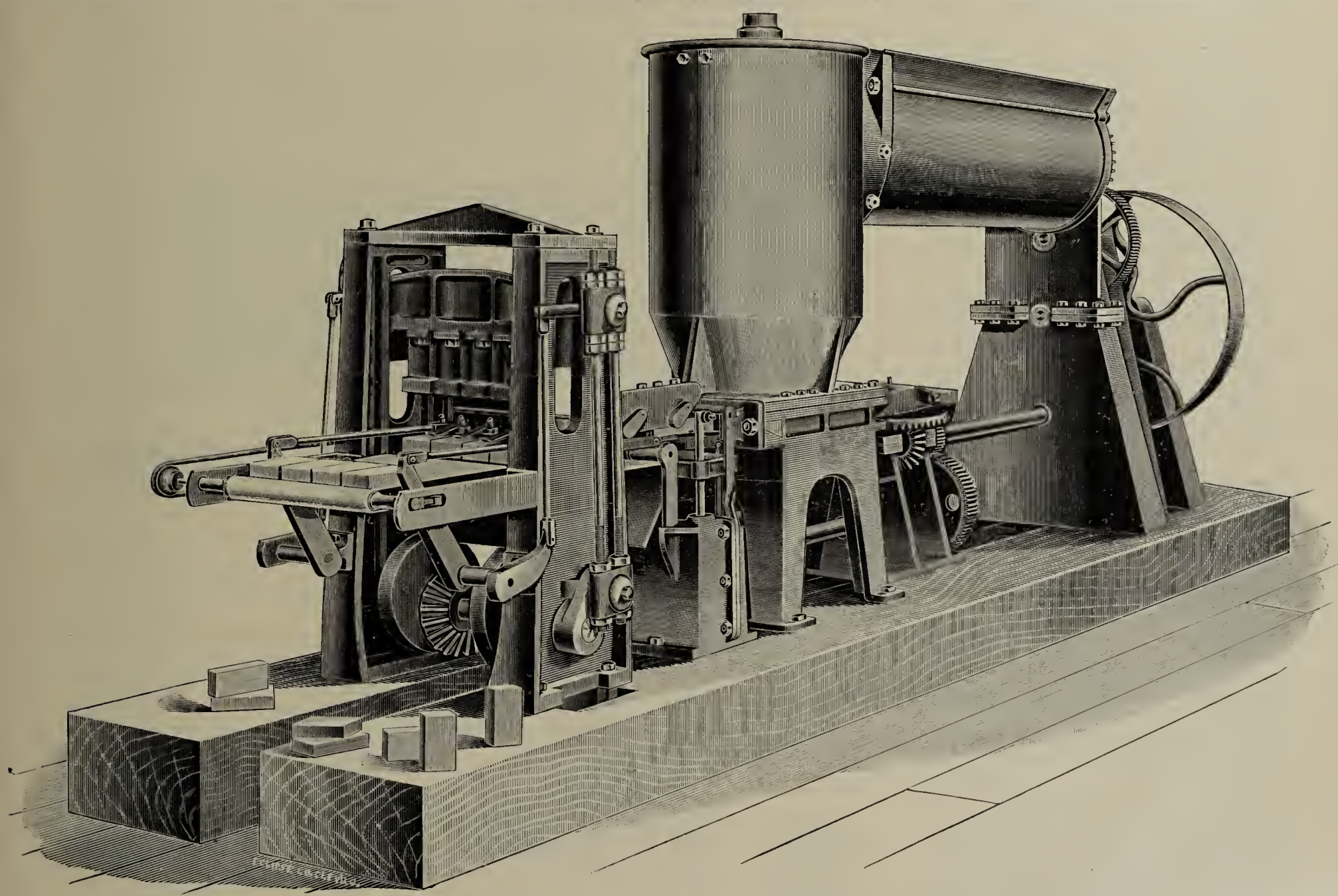
A Perfect Brick Machine.

STRONG, POWERFUL, SIMPLE and POSITIVE.

Absolutely Unbreakable. **Less Working Parts than any other Machine.**
Without Repressing Attachment.

The DICTATOR BRICK MACHINE will take the Clay or Shale as it comes from the bank or Dry Pan and automatically produce perfect repressed brick.

NO LAMINATION.



DICTATOR BRICK MACHINE. Capacity 40,000 Perfect Repressed Brick per day.

The only machine in the World, that will Automatically produce perfect Repressed Brick.

The Battenfeld Mfg. Co.,

Write for Catalogue, *922 Garfield Bldg, CLEVELAND, OHIO.*

THE SIZES OF BRICK.

We frequently receive inquiries as to the sizes of brick. Below we give some figures that will be found useful by our correspondents and others.

There is some difference in size between bricks of the lighter and the darker shades—however, all bricks of any one shade are uniform in size. The following is approximate:

	Approximate size in inches.
Standard size, red	$8\frac{1}{8}$ x $2\frac{3}{8}$ x 4
Standard size, other colors..	$8\frac{1}{4}$ x $2\frac{1}{4}$ x $4\frac{1}{8}$
Roman size, red.....	$11\frac{3}{4}$ x $1\frac{11}{16}$ x 4
Romen size, other colors ...	$11\frac{5}{8}$ x $1\frac{5}{8}$ x 4

A NEW KIND OF CHIMNEY BRICK

A German system of chimney building has been recently introduced into this country, says the Boston Transcript. These chimneys are of round construction, being built of radially molded bricks, perforated. The perforations serve as a dead air space, preventing radiation through the walls, resulting in better average draft and causing same to be less affected by atmospheric changes. A sufficient number of sizes and shapes of these are carried in stock to enable the builder to produce a circle of any diameter, and thus to build a chimney of any size, and to conform to the diminishing radius as the height increases. These bricks are much larger than the common form and the joints are correspondingly fewer. No attempt is made to make the perforations register. They serve simply to give the mortar a better hold and to furnish dead air spaces, which retard the radiation. It is possible, too, that they serve a useful purpose in the uniform burning of the brick. At all events, brick so perforated crushed at 5,035 pounds per square inch against 4,987 pounds for solid brick made out of the same material. The perforations increase the adhesion of the joint about three-fold.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

FOR SALE—One 80-horse-power slide valve Farquhar engine and one Canton pump; all in good condition. Inquire of
FREDERICK BRICK WORKS,
8 1 d Frederick, Md.

WANTED—Position as manager of dry press brick works, or as burner of any kind of brick; no salary required until proof of ability is given. Address
8 1 c D. M., care Clay-Worker.

FOR SALE—Cheap, one intermediate wonder brick machine, which we purchased new from the manufacturers in 1898, and have used about six weeks.
LUDOWICI ROOFING TILE CO.,
8 tf d 508 Chamber of Commerce, Chicago.

WANTED—Good setter; down draft kilns; high grade bricks; good wages. Address
8 1 c CANUTE, care Clay-Worker.

WANTED—First-class front brick setter; give references and wages expected.
KIRK, care Clay-Worker,
8 1 d Indianapolis, Ind.

WANTED—Workman wants position in enamel brick works; at last place was assistant in mixing room, and also in firing kilns. Address
8 1 c GRANT, care Clay-Worker.

WANTED — Situation as superintendent or burner of dry pressed plant by thoroughly competent man; hustler and economist; can furnish excellent reference as to habits, ability, etc. Address.
8 2 d ENTERPRISE, care Clay-Worker.

FOR SALE—A good paying brick and tile plant, located in Central Iowa. All machinery, kilns, sheds, etc., in first-class running order. Good market for entire output. Satisfactory reasons given for selling. Address GOOD BARGAIN,
8 tf d Care Clay-Worker.

WANTED — A superintendent; also, a bookkeeper, for works of thirty to forty thousand bricks per day; product, fire, paving and building brick, hand mold and stiff mud process; flint and plastic fire clays. Address
8 1 d FIRE CLAY, care Clay-Worker.

WANTED—Position by a German M. E. for Ceramics. Well experienced in calculation construction and building of kilns, furnaces, chimneys and all constructive details. Can render valuable service in Fire Brick, Terra Cotta or Tile manufacture. The best of references. Address "G. V."
8 1 c care Clay-Worker.

WANTED — Situation as superintendent of building brick plant. Have had several years' experience with Chambers' machine, steam shovel, etc. Can give best of reference. A permanet position more important than salary. Understand the management of men. For other particulars address.
6 tf d r MR. PUSH, care Clay-Worker.

DO YOU KNOW

We Manufacture

Stock or Front Bricks,
Ornamental or Shape Brick
...IN...
RED, GRANITE,
BUFF, GRAY
and MOTTLED.

The PROGRESS
BRICK PRESS.

Complete Brick Yard Equipments

Brick Yard Supplies.

Catalogue on Application.

We issue a Catalogue on Ornamental and Shape Bricks on application, and offer a liberal discount to dealers.

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. ST. LOUIS, MO.

The Belt for the Brick Yard

Is the one that is not impaired in length or kind of service, when subjected to excessive weather, moisture or dust conditions. There is only one constructed to withstand these without injury, and it is

LEVIATHAN BELTING.

Our customers bear us out in this, and a trial order will demonstrate it to you.

MAIN BELTING COMPANY,

1221-41 Carpenter St., Philadelphia, Pa.

55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.

Write for Samples and Price Lists.

KENDALL & FLICK

MANGANESE

FOR ALL USES.

BOOKLETS AND PRICES ON REQUEST.

618 PENNA. AVE. N. W. WASHINGTON, D. C.

MORRISON'S LATEST IMPROVED KILN

For Burning Building Brick.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object. Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335, Rome, Ga., U. S. A.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } Chenoa, Ill.

FOR SALE—A modern brick plant in whole or separately, viz., 175-h. p. locomotive boiler, 150-h. p. Corliss engine, Chambers and Martin machines, pug mill, presses, dryer, 200 brick cars, castings and grates for five kilns, etc.
BERTOLETTE MACHINERY AGENCY,
8 1 d 436 N. Third st., Philadelphia.

FOR SALE—One-half of 160 acres; valuable improvements; inexhaustible supplies; unlimited sales of valuable material in the land; profits very large; two hours from New York City; many daily trains. Want good partner with financial ability to ship $60,000 worth now annually, and enlarge future sales. Address
8 2 c A. S. L. O., care Clay-Worker.

WANTED—A situation as superintendent or foreman of terra cotta, tile or pressed brick plant. Understand all the details of making and burning porous terra cotta. Also the construction of kilns of all sorts. Satisfied with moderate salary if the situation is permanent. Best of references. Address
8 tf tr MILFORD, care Clay-Worker.

FOR SALE—Big Wonder brick machine, with iron pug mill, fitted for the manufacture of either side cut or end cut brick; also, one Columbia single die repress, all in first-class condition. Reason for selling, no clay at our plant suitable for the machine. For further particulars address LEXINGTON BRICK CO.,
7 tf d Lexington, Ky.

FOR SALE—An interest in a pressed brick plant, located advantageously for Chicago, Western and Southern trade; need additional capital to extend the business; can not fill orders with present capacity; cheap labor, cheap coal, low taxes and free from strikes; fullest investigation solicited; references furnished and required. Address
8 1 k CHICAGO, care Clay-Worker.

WANTED—Situation as superintendent of either dry pressed or plastic brick plant by one who has a thorough and practical knowledge in the departments of manufacturing same. Well acquainted with the most modern methods of burning in either up or down draft kilns; can give A No. 1 references from both present and past employers. Address.
8 1 d P. W. G., care Clay-Worker.

FOR SALE—An interest, large or small, in a modern equipped brick plant, especially adapted for the manufacture of fancy sidewalk and face brick, hollow building blocks and drain tile. There is a big demand for these goods and a splendid business opening for any one who has a small amount of money to invest and the ability to take complete charge of the plant, the owners having other business which demands their entire attention. Address
8 1 d BRICK PLANT, care Clay-Worker.

FOR SALE—One of the best money making brickyards, consisting of over 200 acres of clay land suitable for making brick; two boilers, two engines, one soft mud and one stiff mud brick machine, two disintegrators, one mold sander, one tile machine, dryer and racks, with car, pallets and trucks for same; six kilns, two large docks, drum and cables, with three cars for hauling clay to machine. (The clays burn a rich dark red.) There are also six houses and two barns on the property, which is fenced in by a wire fence. This property is splendidly located on a large river, with plenty of market for the brick, and also a nice farm. For further information, address
8 1 d BENTON, care Clay-Worker.

WANTED—Four first-class kiln setters to work in continuous kilns; five chamber men to load wagons; two men for pugging clay for machines; two experienced men for handling cores, must also understand cutting clay by wire process; two burners for continuous kilns, must be active and practical, understand burning by our process, which is with coal and oil, and have A No. 1 references; three pan feeders who understand mixing clay in dry pans; two practical burners for glazing sewer pipe, must have had experience with salt glazing; one pressman and one first-class branch sticker. The men must not be afraid of work and must be in good physical condition. Good wages to good men. Address R. SOUTH,
Care San Francisco Brick Co.,
8 1 r San Francisco, Cal.

FOR SALE—Seventy double-deck dryer cars, two transfer cars and two turntables, rails, etc. Address
8 2 c 12 SCHMIDT, care Clay-Worker.

A WELL EDUCATED German engineer and chemist will undertake the construction of any size cement works. Many years experience and thorough knowledge of the business in all its details. Address
EMIL MULLER,
6 1 5 p 18 Paula St., Havana, Cuba.

FOR SALE—Half interest in one of the best equipped brick plants in the Ohio valley; 20,000 per day, 8 tunnel dryer, 2 up-draft, 2 round down-draft kilns, natural gas fuel, all in good running order, plant has made 1,000,000 since April 15, reason for selling other business needs attention. For price, address
6 2 d TREBE, care Clay-Worker.

BRICK MACHINERY FOR SALE.

We have purchased the entire equipment of a large St. Louis brickyard and have for sale one six-mold Ross Keller dry press, one two-mold Whitaker press, engines, boilers, pumps, disintegrators, wheel scrapers, cars, kiln doors and frames, grates, etc.; also, a large lot of miscellaneous machinery, shafting, pulleys, hangers, belting, elevators, etc. Will sell whole or in parts to suit.
SCHOELLHORN-ALBRECHT MACHINE CO., St. Louis, Mo. 8 tf d

FOR SALE.

One Iron Standard Steam Power Machine, with pug-mill attached.
One Anderson Brick Machine, with 12-foot Pug Mill.
One new Brewer Crusher; one second-hand Brewer Crusher.
One Carnell Repress.
One Penfield Soft Mud Machine.
One 40-h. p. Boiler and Engine.
One Monarch Machine, used two summer seasons; in excellent repair.
THE HORTON MFG. CO.,
8 1 1 Painesville, Ohio.

BARGAINS—FOR SALE:

Several second-hand brick machines, steam power.
One second-hand horse-power brick machine.
One second-hand mould sander, almost new.
One second-hand 25-horse-power engine, in perfect order.
One second-hand 25-horse-power boiler.
One wire cut brick machine complete with die.
One dry pan, new.
HENRY MARTIN BRICK MACHINE MFG. CO., Lancaster, Pa. 7 tf L

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

LE CHATELIER'S

PYROMETER

For measuring temperatures between 0 and 1600° Celsius, equal to 2920° Fahrenheit.

RECOMMENDED BY THE HIGHEST AUTHORITIES, and

Successfully used in establishments for the manufacture of

BRICKS, TILE, TERRA COTTA, STONE WARE, PORCELAIN, IN POTTERIES AND ALL CLAY WORKING INDUSTRIES, as well as

IRON AND STEEL AND ALL OTHER METALS,

Gas, Chamotte,
Glass, Chemicals,
Sugar, Cement,
Accumulators, Incandescent Lamps,
Cartridges and Ammunition.

Also by Boiler Inspectors, Schools and Colleges and for **Hardening and Annealing Steel in Roll Foundries, Etc.**

CONSTRUCTED BY

W. C. HERAEUS, Platinum Works,
Hanau, Germany.

Prices and Descriptive Pamphlet on Application.

REPRESENTATIVE:

CHARLES ENGELHARD,
41 Cortlandt Street, New York, N. Y.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

G. COLDEWE & CO.,

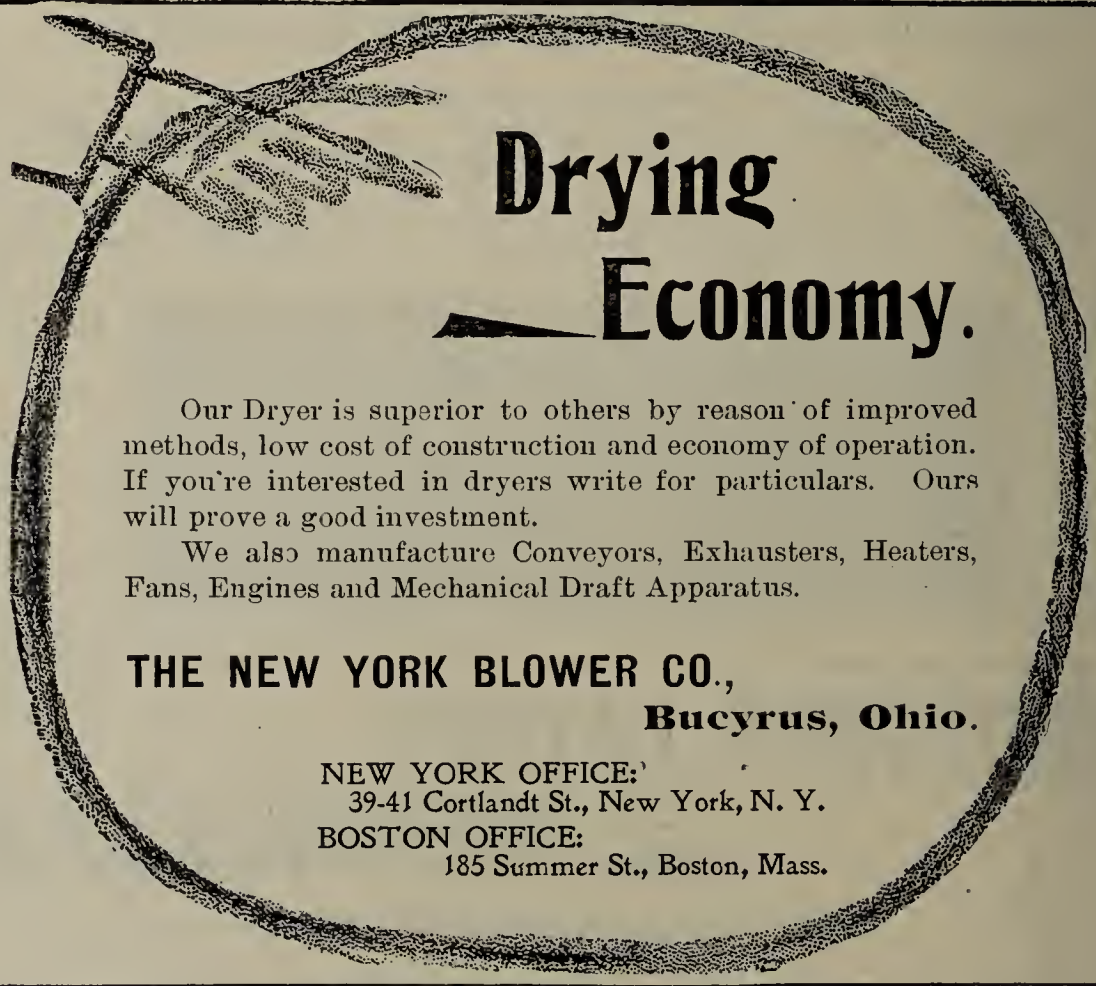
MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE MOULDS

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Drying Economy.

Our Dryer is superior to others by reason of improved methods, low cost of construction and economy of operation. If you're interested in dryers write for particulars. Ours will prove a good investment.

We also manufacture Conveyors, Exhausters, Heaters, Fans, Engines and Mechanical Draft Apparatus.

THE NEW YORK BLOWER CO.,
Bucyrus, Ohio.

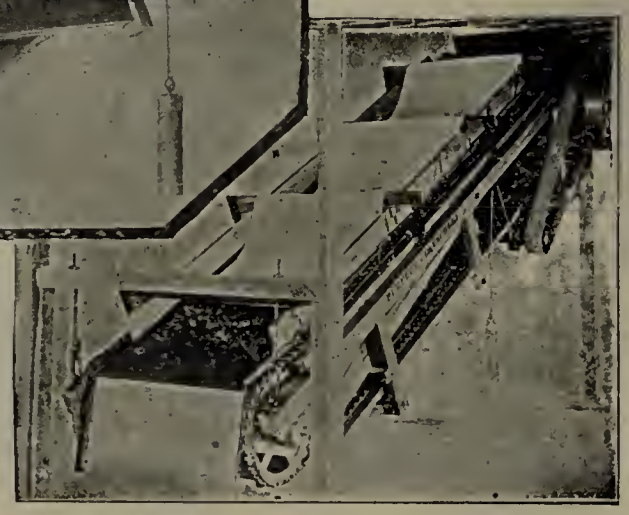
NEW YORK OFFICE:
39-41 Cortlandt St., New York, N. Y.
BOSTON OFFICE:
185 Summer St., Boston, Mass.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush

HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

For Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan Bark, Cinders, Ores, Sawdust, Lime, Cement, etc. Also continuous Pan Conveyors.

Iowa Pipe and Tile Co , Des Moines, Iowa.
Borden & Selleck Co , Chicago:
Gentlemen—We have used the Harrison Conveyor for the past two years. It takes about ninety tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours truly, IOWA PIPE & TILE CO.

BORDEN & SELLECK CO., Mfrs. and Sole Agents, **48 & 50 Lake St., Chicago.**

Send for Illustrated Catalogue.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS, Agent and Patentee, **161 Grand Street, Rahway, N. J.**

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.

For **uniformity** in **burning, hardness of ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump,** and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

THREE EXCURSIONS TO NORTHERN MICHIGAN

will be run via Pennsylvania Lines. The dates are August 30, September 6 and 8. For particulars about rates, etc., apply to W. W. Richardson, D. P. Agent, Indianapolis.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.
PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.
SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH.
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 4 tf d

FOR SALE.

One Iron Standard steam power machine, with pug mill attached.
One Fletcher & Thomas pug mill.
One Anderson Brick Machine, with 12-foot pug mill.
Two reliable hand brick machines.
One new Brewer Crusher.
One second-hand Brewer Crusher.
One Carnell repress.
One Penfield No. 7 brick and tile machine.
One Penfield soft mud machine.
One Penfield double plunger brick machine.
One Freese board delivery cut-off table.
One Fate-Gunsaulus rotary table.
One forty-horse power boiler and engine.
One Monarch Machine, used two summer seasons; in excellent repair.
THE HORTON MFG. CO.,
4 tf d Painesville, O.

NORTHERN MICHIGAN EXCURSIONS

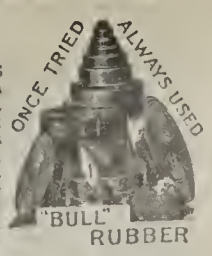
To Traverse City, Petoskey and Mackinac Island, Via Pennsylvania Lines.

The dates for the low rate excursion to Northern Michigan via Pennsylvania Lines are August 30, September 6 and 8. On those dates excursion tickets to Traverse City, Petoskey and Mackinac Island may be obtained. The return limit will include thirty days from date on which tickets are sold.

This will be an excellent opportunity for an outing in Northern Michigan. Fishing will be at its best; the hunting season will be open, and the pure air will be invigorating and healthful, while the lakes and woodland will be especially attractive.

Round trip rate from Indianapolis will be $10 to Traverse City or Petoskey and $11 to Mackinac Island. Corresponding low rates will be in effect from other ticket stations on the Pennsylvania Lines. For details apply to W. W. Richardson, District Passenger Agent, Indianapolis.

ODD LENGTHS OF RUBBER AND GIANT RED STITCHED, from 2 ft. to 80 ft. long, and from 1 in. to 16 in. wide; 3, 4, 5, 6 and 8 ply. **First-Class Belting** less than mfrs. cost prices. **Get Our Prices** on Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gages, Brass Fittings, Hard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws, Asphalt Felt Roofing, Endless Thresher Belts.



One Trial will make you a regular customer of the **MILLER OIL AND SUPPLY COMPANY, 36 McNabb St., Indianapolis, Ind.**

VanDuzen's STEAM JET **Pumps.**

Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

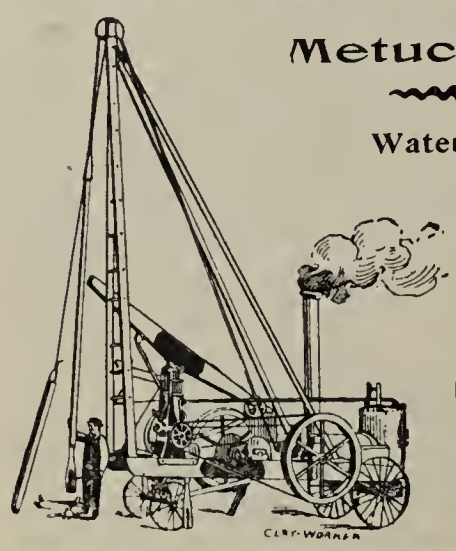
$6.95 to $99.75

At from $6.95 for a 100-pound house safe to $99.75 for a very large double outside and double inside door bank or public office safe, we sell the **HIGHEST GRADE FIRE-PROOF COMBINATION LOCK SAFES MADE,** letter your own or firm name on, and ship to anyone any place in the United States, payable after received. For $23.95 we sell a good size safe for any store, office, factory, shop or hotel. **We will save you more than one-half in price.** For full particulars, special safe catalogue, special pay-after-received offer, etc., cut this notice out and mail to us. **SEARS, ROEBUCK & CO., CHICAGO.**

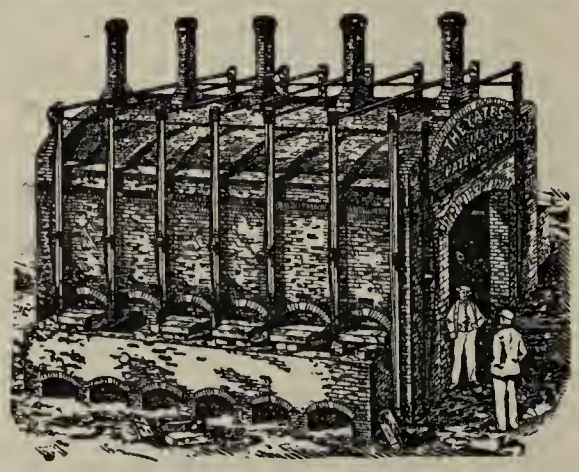
W. R. Osborne,

Metuchen, N. J.

Water Wells, Tanks, Pumps, Etc.



LOW PRICES

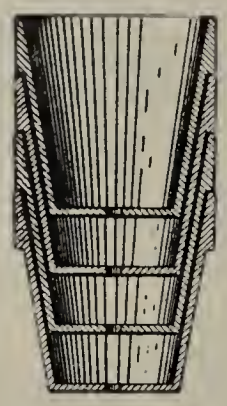


Economy of Fuel and Large Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.

Hot air dryer. Continuous and Muffle Kiln

ALFRED YATES,
JOHNSONBURG, PENN



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

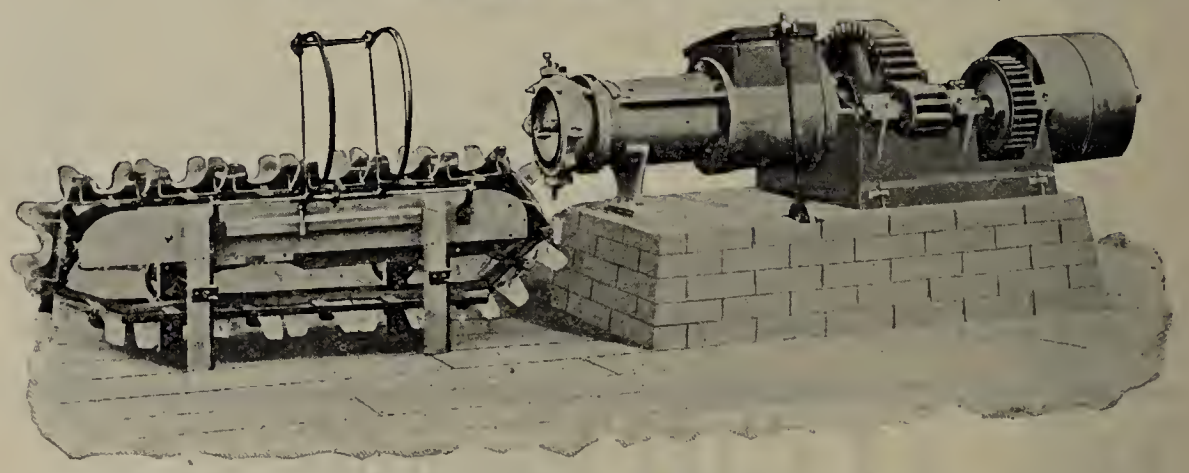
No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
78 South Pennsylvania St., INDIANAPOLIS, IND.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,
Detroit, Mich., U. S. A.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

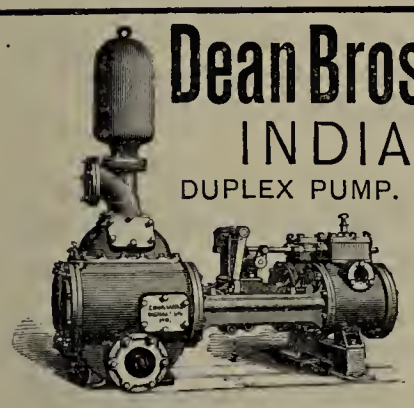
Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Dean Bros.' Steam Pump Works

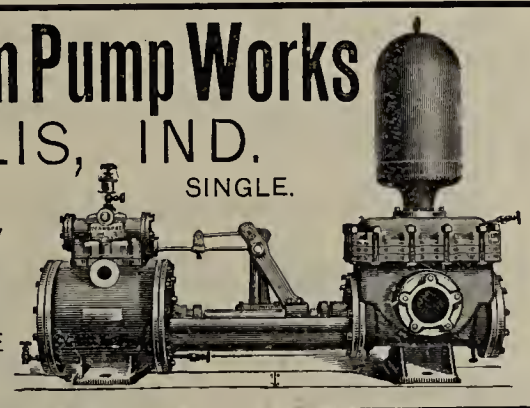
INDIANAPOLIS, IND.

DUPLEX PUMP. SINGLE.



PUMPING MACHINERY FOR ALL PURPOSES.

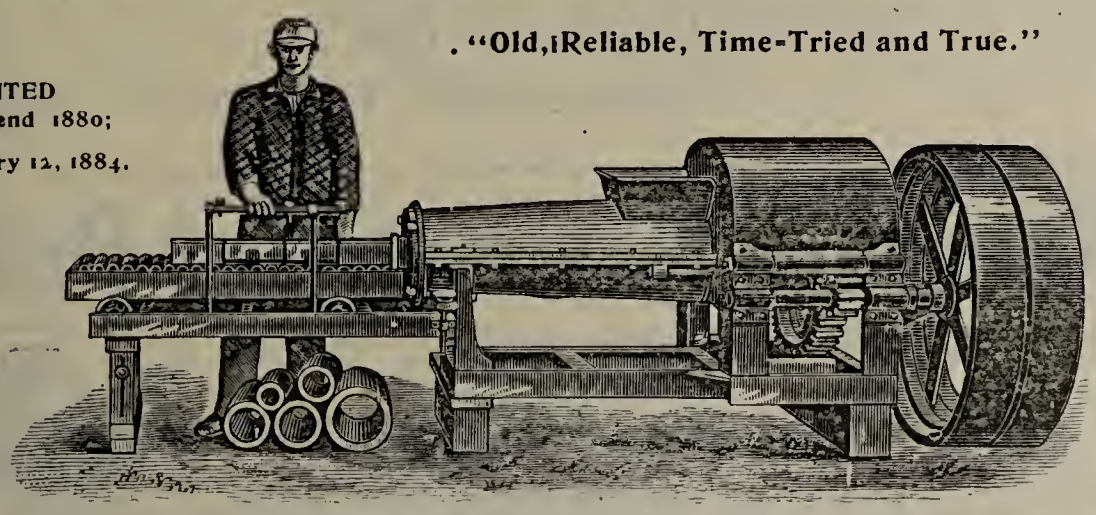
SEND FOR CATALOGUE AND PRICES.



KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞ For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of WELLS & HALL,
Successors to WESTBROOK & WELLS,
Ogdensburg, N. Y.

GABRIEL & SCHALL

P. O. Box 2654. **205 Pearl Street.**

NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. **Carbonate of Barytes**

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent. CINCINNATI, OHIO

H. W. FULLER, Gen'l Pass. Agent, WASHINGTON, D. C.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 3:05 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 12:20 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY.

Lv Indianapolis. 4:10 am. 8:05 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

Have you thought About your Cuts for your NEXT CATALOGUE?

We Make 'em Right

INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.
INDIANAPOLIS, IND.

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY,
Industrial Agt., St. Louis, Mo.

or

E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between CINCINNATI and INDIANAPOLIS, DECATUR, SPRINGFIELD, JACKSONVILLE, HANNIBAL and QUINCY.

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	4.05 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

Solid Train Between

Sandusky and Peoria

—AND—

INDIANAPOLIS and MICHIGAN CITY,

FT. WAYNE and CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger	7:00 a. m.
*No. 22 Passenger	1:20 p. m
No. 24 Passenger	7:00 p. m

SOUTH BOUND—ARRIVES.

*No. 21 Passenger	10:20 a. m
No. 23 Passenger	2:50 p. m
No. 25 Passenger	6:20 p. m

*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent, Lake Erie & Western R. R

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

PATENTS GUARANTEED

Our fee returned if we fail. Any one sending sketch and description of any invention will promptly receive our opinion free concerning the patentability of same. "How to obtain a patent" sent upon request. Patents secured through us advertised for sale at our expense.

Patents taken out through us receive *special notice*, without charge, in THE PATENT RECORD, an illustrated and widely circulated journal, consulted by Manufacturers and Investors.

Send for sample copy **FREE.** Address,

VICTOR J. EVANS & CO.,
(*Patent Attorneys,*)
Evans Building, - WASHINGTON, D. C.

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

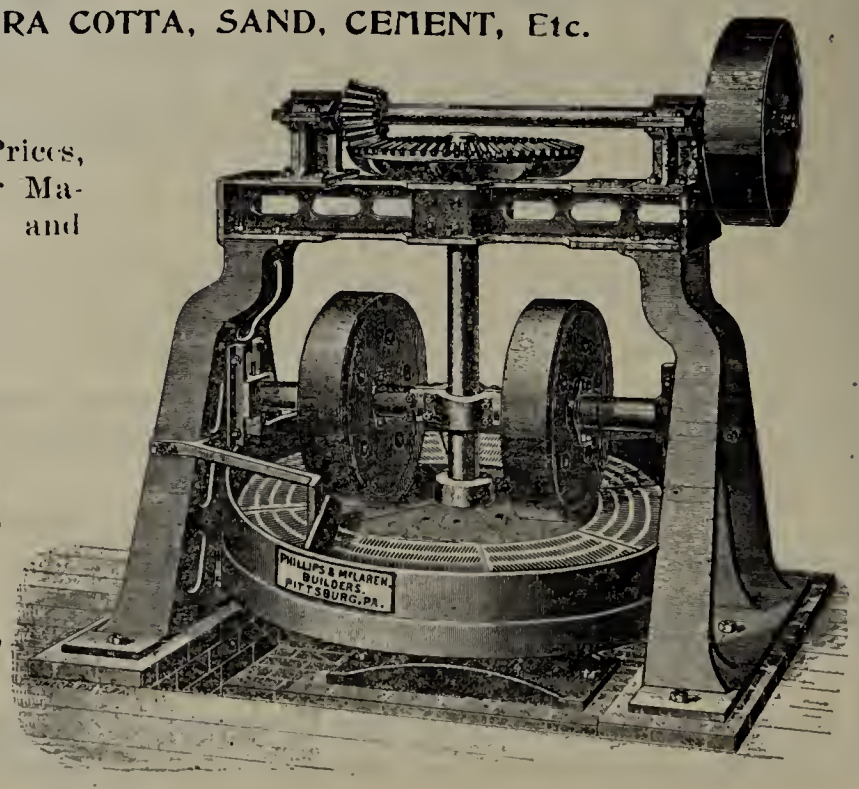
Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

W. B. MERSHON & CO.,
Saginaw. East Side Mich.

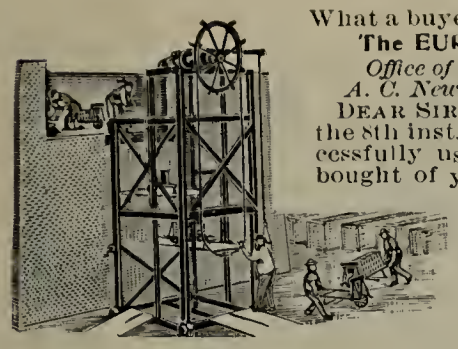
Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.



Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.

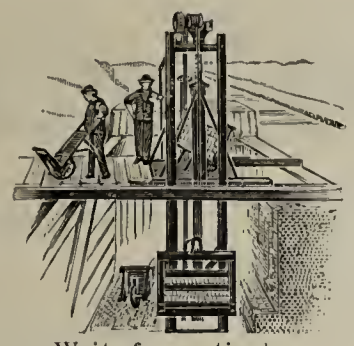


What a buyer in 1890 says to-day of
The EUREKA BRICK ELEVATOR

Office of the Buffalo Brick Association,
A. C. Newton, Patentee, Cresent, N. Y.

DEAR SIR—Replying to your inquiry of the 8th inst., this Association is still successfully using the two brick elevators bought of you in 1890. They are useful and practical machines, and the long and hard use of them by us shows that they are constructed in a very serviceable manner.

Very truly yours,
The Buffalo Brick Asso.
O. W. WAGER, Mgr



Write for particulars.

A. C. NEWTON, Manufacturer, Crescent, N. Y.

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels, Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

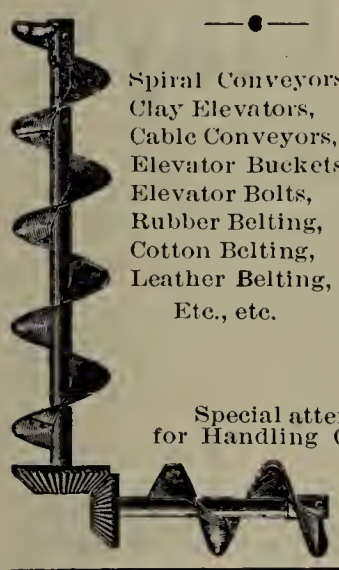
H. W. CALDWELL & SON CO., Western Ave, 17th-18th St. CHICAGO, ILL.

Our new Catalogue No. 25 (380 pages), will be sent upon application.

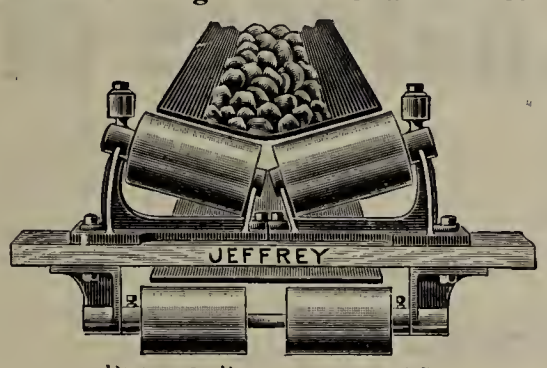
The JEFFREY MANUFACTURING CO., Columbus, Ohio.

Elevating, Conveying and Power-Transmission Machinery.

For Handling Material of all Kinds.



Spiral Conveyors,
Clay Elevators,
Cable Conveyors,
Elevator Buckets,
Elevator Bolts,
Rubber Belting,
Cotton Belting,
Leather Belting,
Etc., etc.



RUBBER BELT CONVEYORS.

Jeffrey Detachable Chain,
Chains, (all styles).
Sprocket Wheels,
Shafting,
Pulleys,
Hangers,
Gearing,
Elevator Boots,
Etc., etc.

Special attention given to the designing of machinery for Handling Clay, Green Tile, Brick, Sewer Pipe and packages of every description. We can in many instances effect a saving of from 10 to 50% over present methods used.

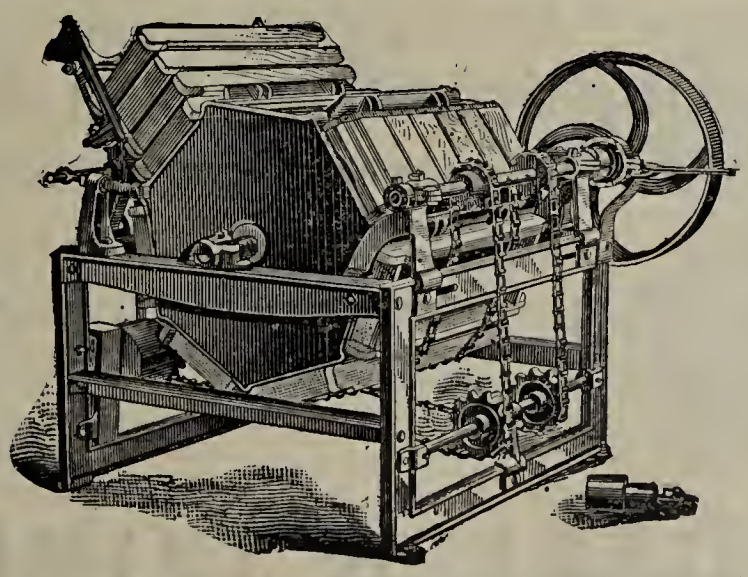
SEND FOR CATALOGUE AND PRICES.

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

The VANDALIA LINE

The Short Line for St Louis and the West.

Leave Indianapolis.		Arrive at Terre Haute.	Arrive St. Louis
No. 15	7:25 am,	9:55 am	5:00 pm
No. 5	6:45 am	8:35 am	12:56 pm
No. 21	12:15 pm	2:05 pm	6:40 pm
No. 7	3:30 pm	5:10 pm	9:40 pm
No. 11	7:05 pm	9:00 pm	1:44 am
No. 19	11:20 pm	1:50 am	7:12 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No. 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.

All trains carry first-class coaches.

12:15 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent,
E. A. FORD, G. P. A. Indianapolis, Ind.

A Perfect Pen

AT A POPULAR PRICE, AND THE BEST PEN AT ANY PRICE

YOUR CHOICE OF THESE

$3.00

Laughlin Fountain Pens

FOR ONLY

$1.00

Try it a Week! If not suited, we buy it back and offer you $1.10 for it.

A Profitable Proposition any way you figure it. Don't miss this opportunity of a life time to secure the best pen made. Hard rubber reservoir holder in four simple parts. **Finest quality diamond point 14k gold pen, and the only positively perfect ink feeding device known to the science of fountain pen making.**

"A gift of never ending usefulness and a constant pleasant reminder of the giver."

☞ Any desired flexibility in fine, medium or stub.

One Pen Only to One Address on this SPECIAL SEED-TIME SALE.

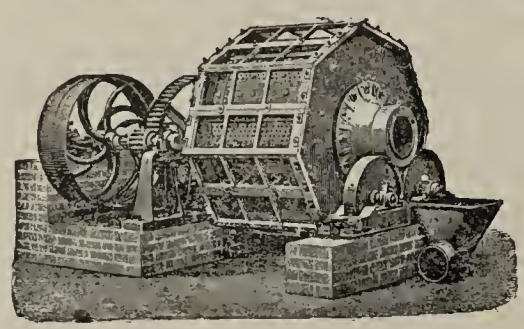
By mail, postpaid, upon receipt of $1. If you desire pen sent by registered mail send 10 cents additional.

Ask your dealer to show you *this* pen. If he has not or won't get it for you, send his name and you order to us, and receive *free of charge* one of our Safety Pocket Pen Holders

Address

LAUGHLIN MFG. CO.,
Laughlin Block,
DETROIT, MICH.

The SMIDTH BALLMILL.



Simplest ✻ Best ✻ Most Efficient.

CRUSHES, GRINDS and SIFTS in one Operation, Working Continuously.
Excells all others in Absolute Uniformity of Product.
Maximum Output. Slight Cost of Repairs. Low Horse Power.
SEND FOR CATALOGS.

F. L. SMIDTH & CO., Engineers,
66 Maiden Lane, N. Y.

COPENHAGEN: Vestergade 29, K.

LONDON: 9 Bridge St., S. W.

Just Out.

The Second Edition of

Tables of Analyses of Clays,

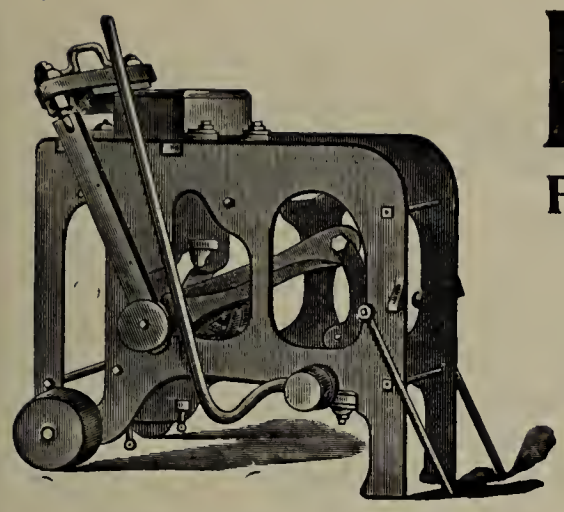
By ALFRED CROSSLEY.

This valuable book has been carefully revised and enlarged to twice the size of the original edition. Among a large number of new analyses is included the leading **Paving Brick Clays and Shales** of America. For purposes of of comparison this work is invaluable, and should find a place in the library of every clayworker. It is handsomely bound in Morocco and will be mailed postage prepaid to any address on receipt of price, $1.00.

T. A. RANDALL & COMPANY,

PUBLISHERS,

INDIANAPOLIS, INDIANA, U.S. A.



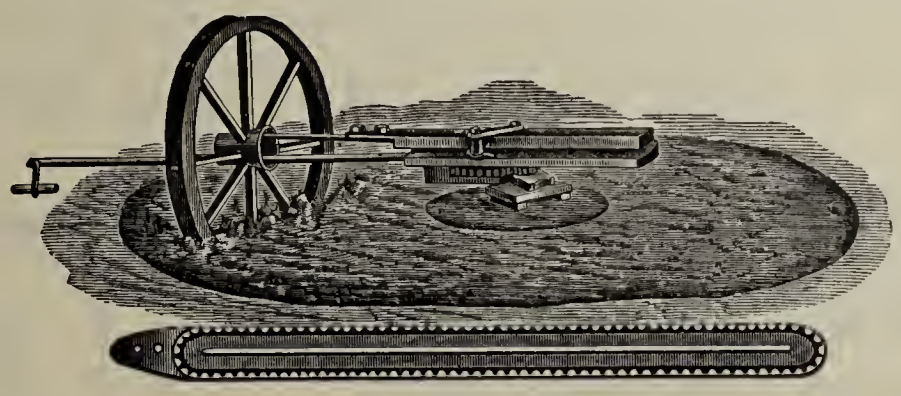
RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

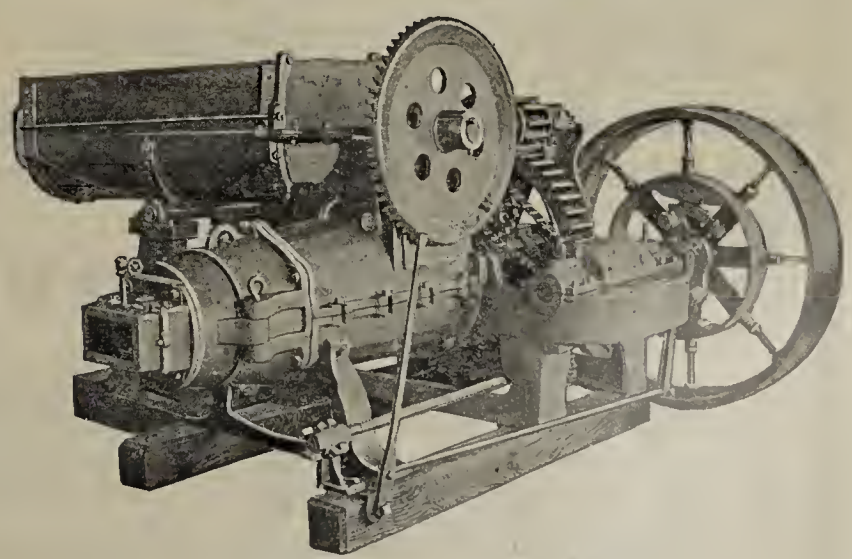
[Mention the Clay-Worker] CORRESPONDENCE SOLICITED

TAKE A LOOK

At this for a Combined Machine. It has the advantages of other combined machines and others besides. It does not interfere with the stiffness and rigidity of the machine "proper."

The feed end of Pug Mill is clear of all machinery. Pug Mill is hinged so it can be raised clear of Machine, leaving everything free of access.

Let us talk to you about it.



All That Could be Desired.

Kinston, N. C., March 27th, 1900.

Messrs. J. C. STEELE & SONS, Statesville, N.C.

Gentlemen:—We herewith enclose check for $—— in settlement of the brick machine, cutting table, etc., purchased of you a short time ago, for which kindly send us receipt.

The machine is working well and we are extremely well pleased with it. It is all that could be desired.

Very truly yours, L. HARVEY & SON.

J. C. STEELE & SONS,

Manufacturers of
The "NEW SOUTH" BRICK MACHINERY,

Statesville, N. C.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades.
Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING.

SYRACUSE, N. Y.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

THE COALDALE BRICK AND TILE CO.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

COALDALE VITRIFIED PAVERS,
Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT, COALDALE, ALA.
TELEGRAPH OFFICE, WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

The Eastern Paving Brick Co.,

MANUFACTURERS OF THE HIGHEST GRADE

VITRIFIED PAVING BRICK

and BLOCK,

For Streets and Sidewalks. Positive guarantee as to wearing qualities. Largest capacity in the East.
Correspondence solicited.

Office and Works, CATSKILL, N. Y.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date.
By H. A. Wheeler, E. M.
Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

R. D. CULVER, Pres. and Gen'l Man.
I. G. POSTON, Sec'y and Treas.

The Wabash Clay Co.,

MANUFACTURERS OF ALL SHALE

PAVING BRICKS AND BLOCKS.

Our leading brands are POSTON BLOCK, WABASH STANDARDS, "SPECIALS," for crossings on macadam streets, GUTTER BLOCKS and COLUMBIAN SIDEWALK BRICK.

Our material has for years successfully stood the heaviest traffic of Indianapolis, Terre Haute, East St. Louis and dozens of other large cities of Indiana and Illinois. We ask investigation and comparison by those seeking the best paving material. Samples furnished on application.

Office and Works at VEEDERSBURG, IND.

Preston Brick Co.,

MANUFACTURERS OF

Vitrified Shale Paving Brick,

SEWER AND HARD BUILDING BRICK.

Hornellsville, N. Y.

T. B. McAVOY, PRESIDENT.
FRANK B. McAVOY, SEC. AND TREAS.

McAvoy Vitrified Brick Co.,

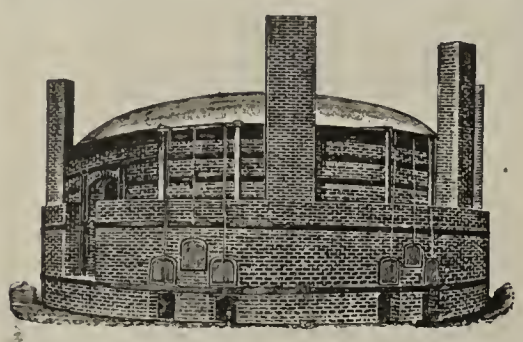
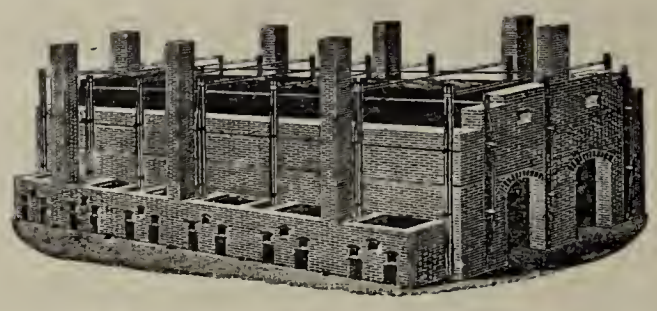
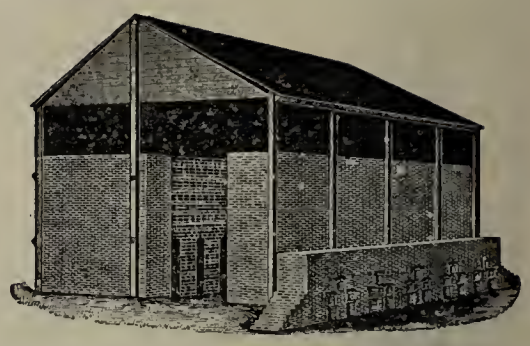
of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

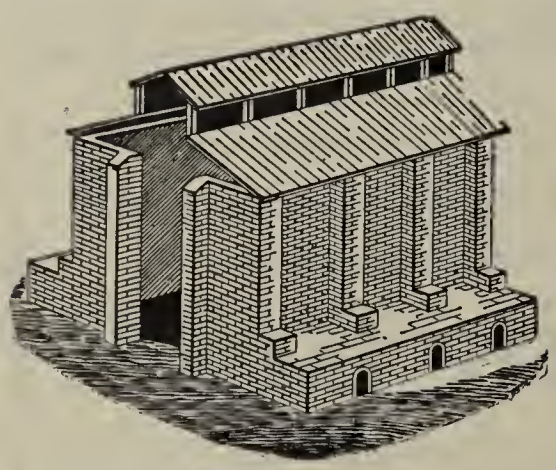
OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.

The THREE KINGS.

SWIFT SLACK COKING TABLE FURNACE KILNS. Hundreds of old kilns changed and many new ones built in the past year. Send for Catalogue and Price List of Plans and Specifications.

F. E. SWIFT, Washington, Iowa. U. S. A.

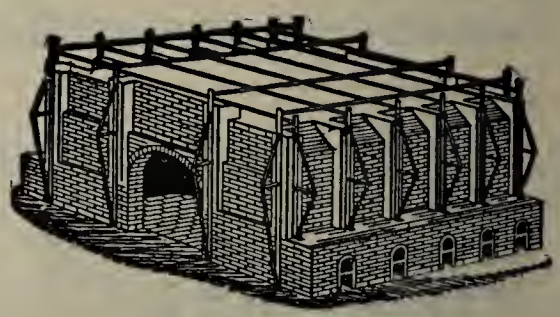


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL,* 2,422 Chestnut St., *Kansas City, Mo.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

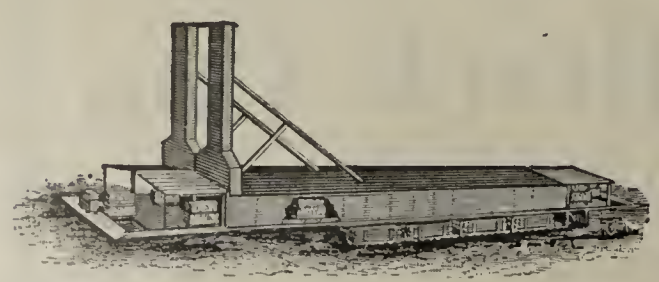
Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

A. F. BARRON,

Patentee and Builder of the

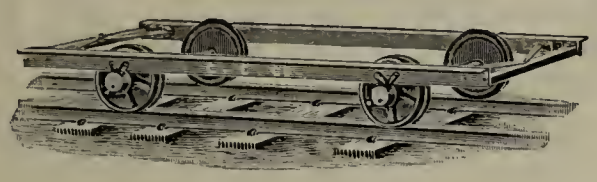
CHICAGO IRON CLAD and BARRON'S TENDER CLAY DRYERS.



These are the gradual outgrowth of a correct principle patented 28 years ago. Every year since that date has witnessed improvements that has kept this system beyond the reach of competition and we now can build Dryers to dry clay products of every grade, even if the clay is of a tender nature. The original principle is still retained. Crude methods of application displaced by money saving devices in steam fitting and construction—enabling patrons to turn out clay products of highest grade in strength and color and at a great saving in expenditure of fuel. In seeking information mention the peculiar nature of the clay, process of manufacture, etc. Address,

A. F. BARRON,

Temple Court Building. **CHICAGO, ILL.**



No. 207.

SOFT MUD FLAT.

FOR FOOT PALLETS.

ANGLE FRAME.

Write for Prices.

The CLEVELAND CAR CO.,
Cleveland, Ohio.

A few facts worth considering.

Our Cars are equipped with

A VERY RIGID TRUSS FRAME,

IMPROVED ROLLER BEARINGS,

AND SOLID WEB WHEELS.

All of which add to their Strength, Durability, and Easy Running Qualities.

La Brique, (The BRICK,)

Published Monthly,
Annual Subscription, $1.50.

Prices of Advertisements.

FOR ONE YEAR:		FOR ONE INSERTION:	
One Page,	$80.	One Page,	$40
One-half Page,	$50.	One-half Page,	$30
One-quarter Page,	$30.	One-quarter Page,	$20
One-eighth Page,	$20.	One-eighth Page,	$15

PAYABLE IN ADVANCE.

Subscriptions and Advertisements for

La Brique

Are received by the Publishers of THE CLAY-WORKER, Indianapolis.

ORGAN OF THE BRICK AND CERAMIC INDUSTRIES IN THE FRENCH SPEAKING COUNTRIES.

10,000 copies sent by post and guaranteed by receipt from Postmaster.

All correspondence to be addressed to

Mr. H. DeWit,

61 Rue Bodeghem, Bruxelles, Belgium.

Most forcible means of becoming known throughout the World, for Brick Engineers. Before the end of the year the journal will be published in English, French and German, so that it may be read by every brickmaker in any part of the world! With the publication in three languages prices of subscription and advertisements will be augmented except for those who will have already signed contracts.

Outing BICYCLES.

HAVE bearings as near perfection as they can be made. We do not claim them absolutely dust proof. This high standard is not attained even in a fine watch. We do claim that there are no better bearings on the market. This is merely one of the many attractive features of the **Outing.** Our catalogue will tell you of others.

Chainless $75.00.

Racer $60.00. Cushion Frame $60.00.

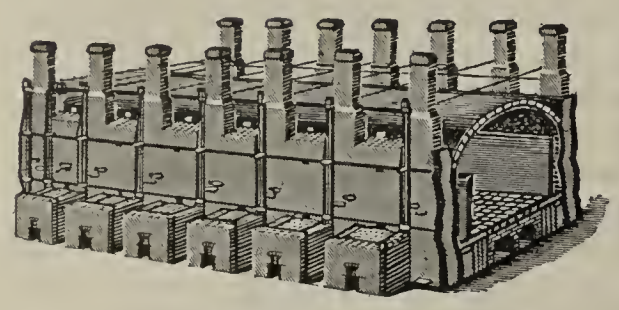
Road Wheels $50.00, $40.00, $30.00.

OUTING M'F'G. CO.,

Indianapolis, Ind.

Ask the Publisher of this Paper what he thinks of the "OUTING."

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Oaks, Pa., January 26, 1900.
M. M. BUSHONG, Phoenixville, Pa.

Dear Sir:—Your letter of inquiry of the 25th inst, in regard to kiln received; in reply will say it gives us great pleasure to say that your kiln is doing splendid work, we have made eleven (11) burns and they were all a great success, in fact it surpassed our expectations in every particular, both to quality of paving brick produced and the amount of coal consumed and we contribute its success to the perfect system of drafts and absolute control of same. In other words if your kiln does not burn evenly from top to bottom or wall to wall it is the fault of the man in charge and not the kiln.

We have had a wide experience in the kiln line and do not hesitate to say that your kiln is the best for burning Shale Paving Brick to be found.

We can assure you that in the future should we build more kilns they will be the **Bushong Down Draft.** Wishing you success we remain,

Yours respectfully,
PERKIOMEN BRICK CO.,
Per HAGGINBOTHAM, Supt.

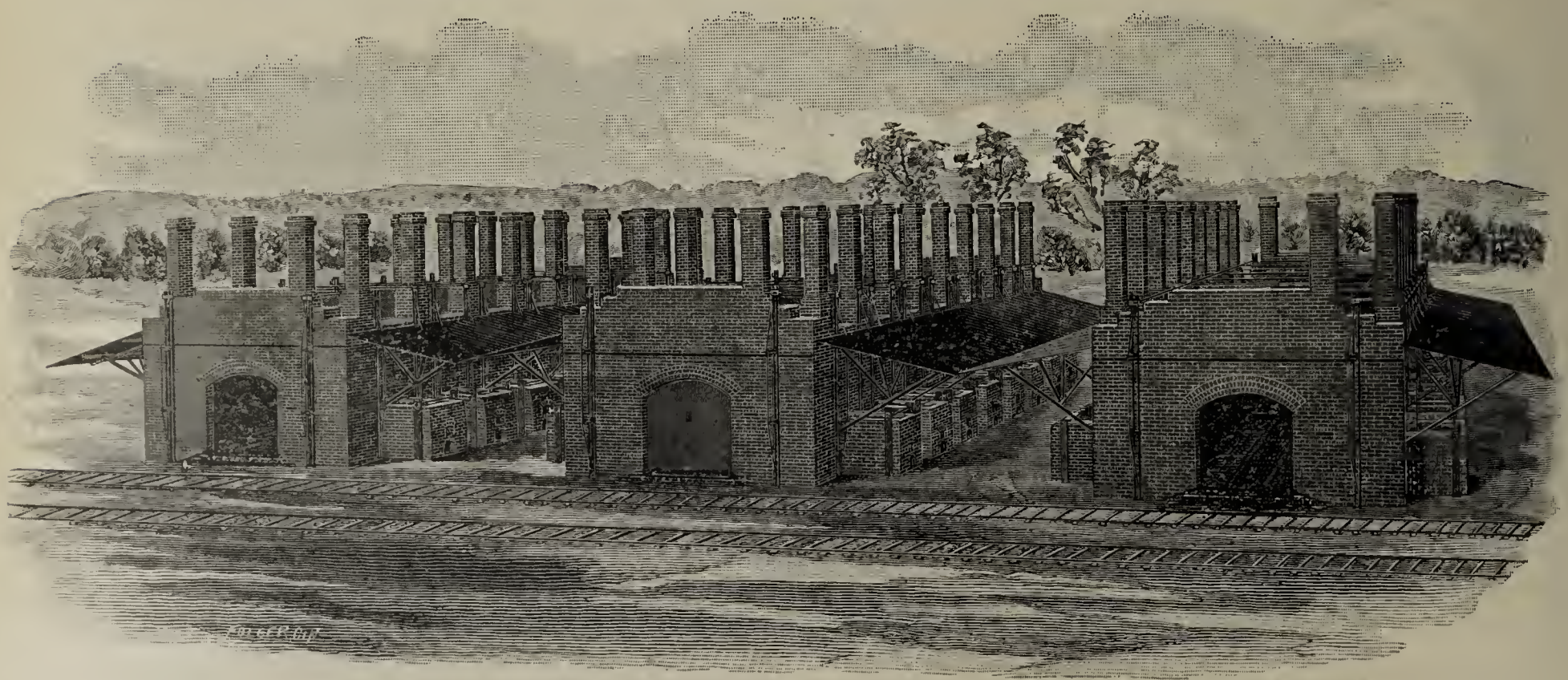
BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.



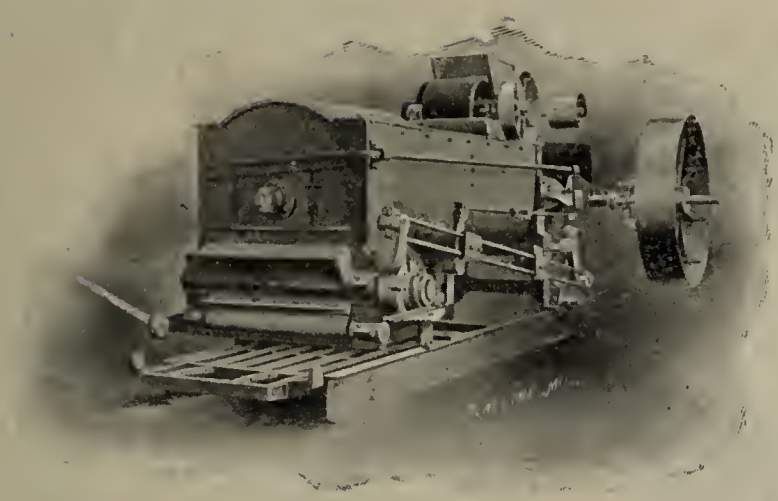
These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

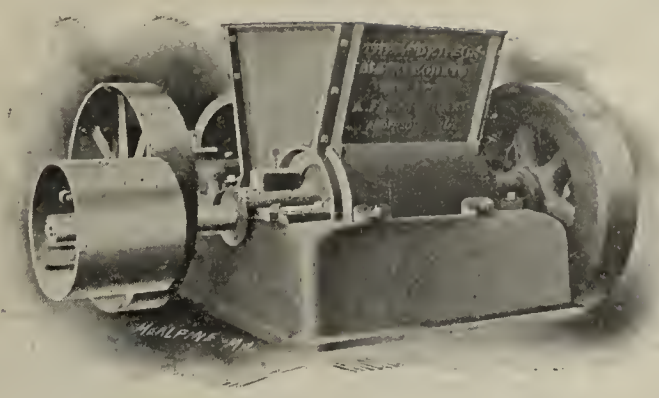
W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



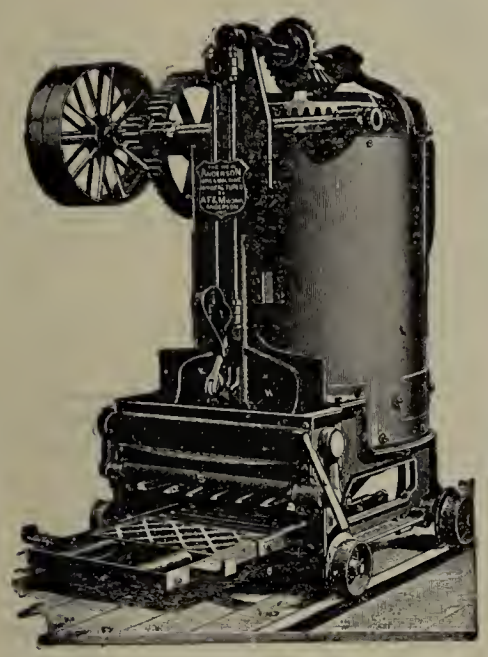
Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



Best Disintegrator on the Market.



Steel and Iron Upright Stock Brick Machine.

MANUFACTURERS OF....

New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

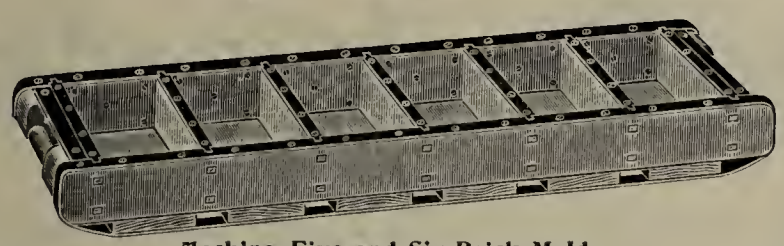
Pug Mills, Moulds, Trucks and Barrows,

And all Brickyard Supplies.

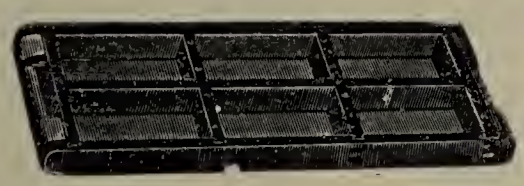
1899 Horse Power Machine.

The Anderson Foundry and Machine Works,

Anderson, Ind.

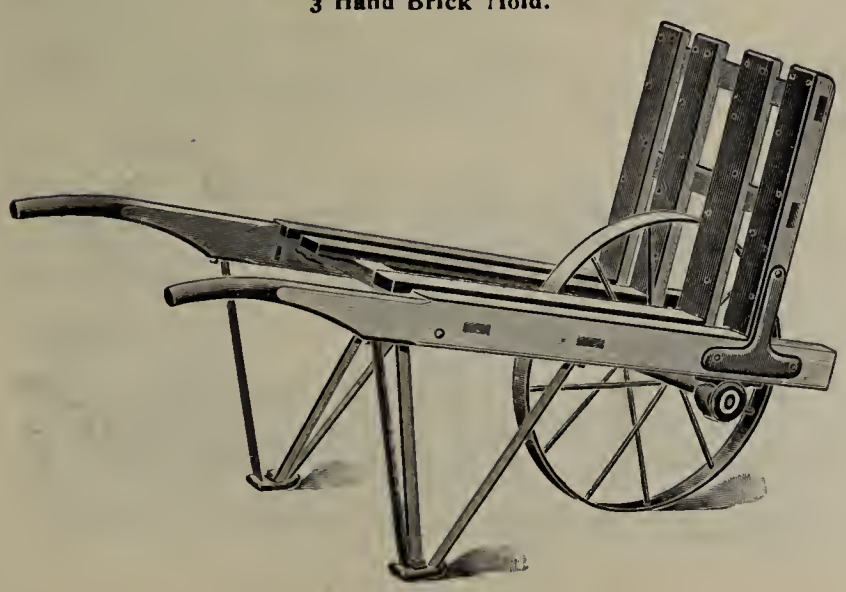


Machine, Five and Six Brick Mold.



6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

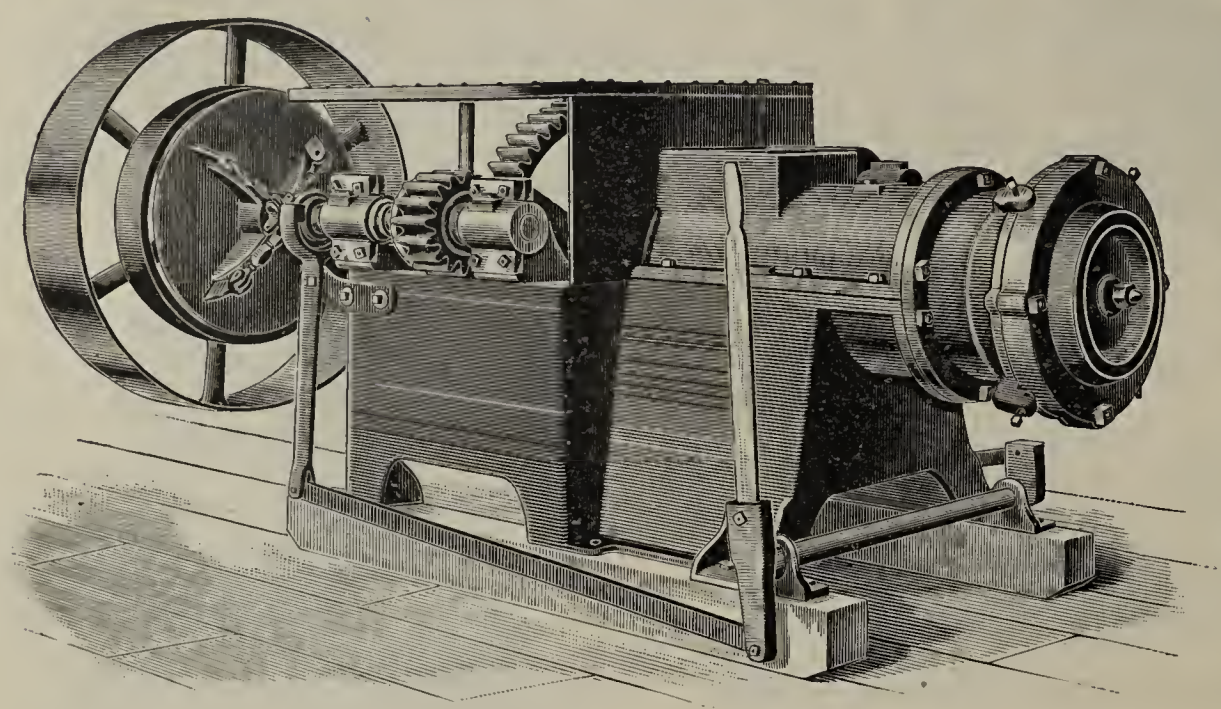
SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

D. J. C. ARNOLD,

New London, O.

Can Not Be Excelled.



LEADER No. 25 with Drain Tile Die Attached.

—OFFICE OF—
FOWLER BROS.,
MANUFACTURERS OF
DRAIN TILE.

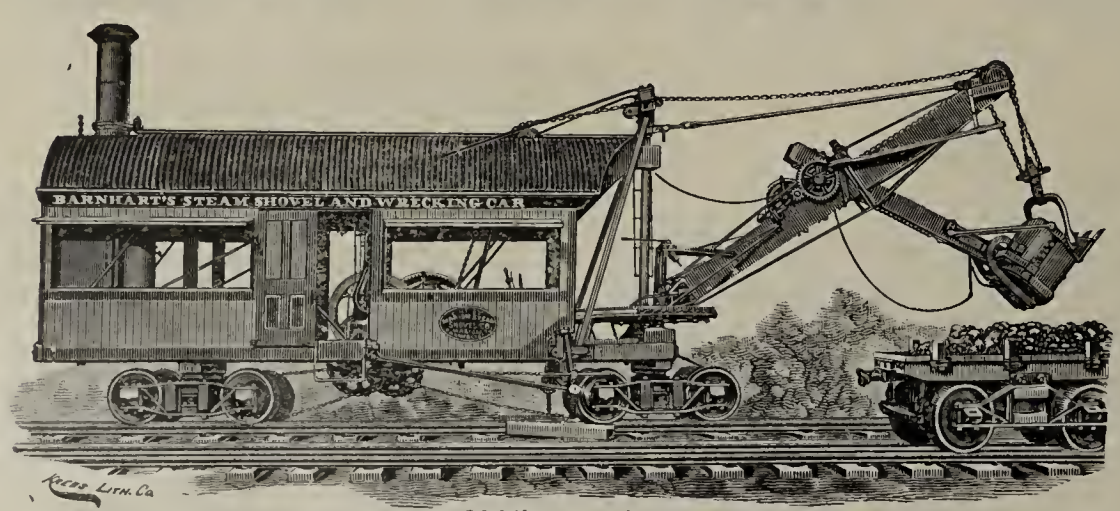
Leach, Ind., August 1st, 1900.
LEADER MFG. CO.,
Decatur, Ill.

Gentlemen: We have been using a LEADER BRICK and TILE MACHINE for SEVEN YEARS, making drain tile, and can say it CAN NOT BE EXCELLED for durability, light running, quantity and quality. Yours respectfully,
FOWLER BROS.

For further words of praise write to

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

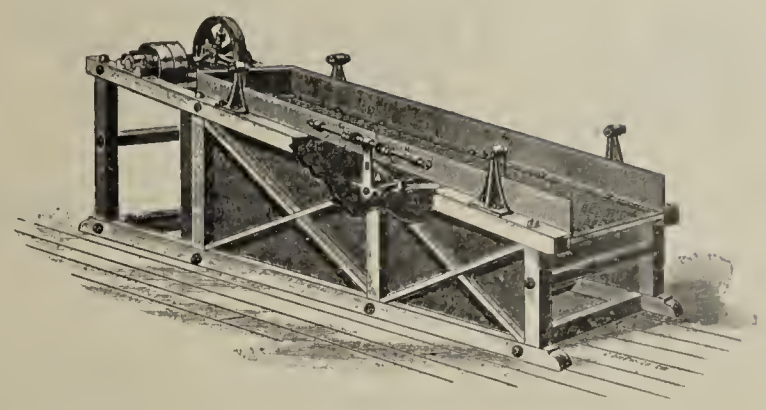
STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

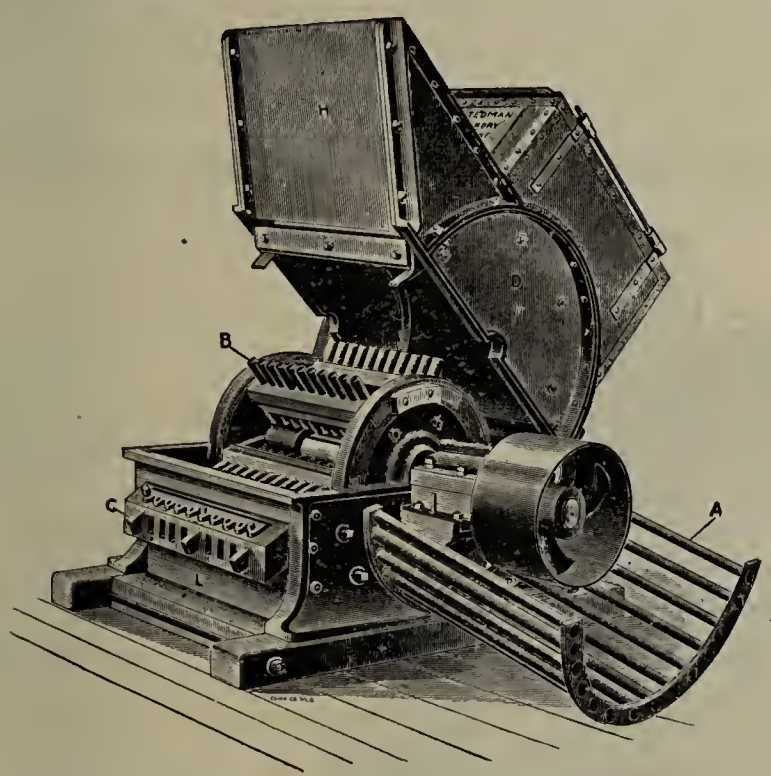
603 West Center Street, - MARION, OHIO.

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.



A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel.



STEDMAN'S CYCLONE CLAY PULVERIZER.

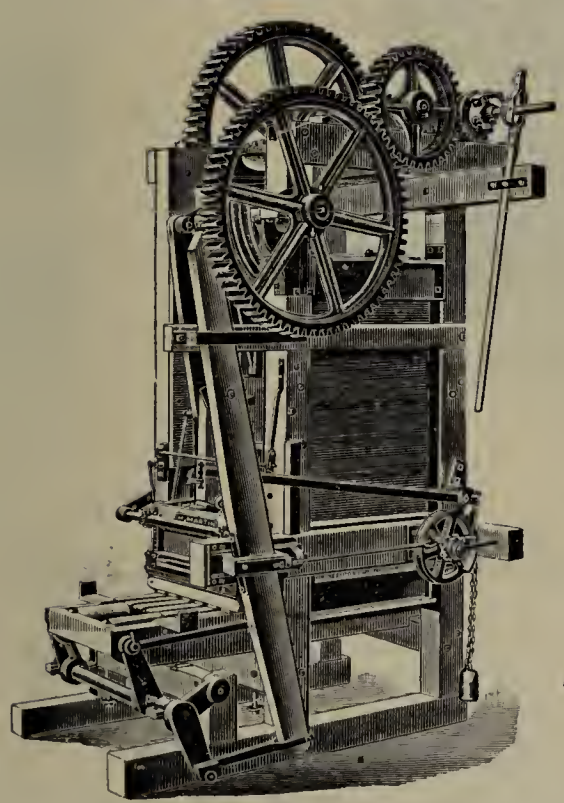
For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials.

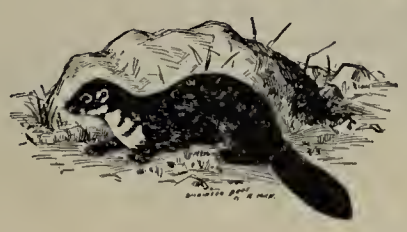
Stedman Foundry and Machine Works,

Aurora, Indiana.



The "MARTIN"

BRICK MACHINERY.



BRICKYARD SUPPLIES.

MANUFACTURED AND SOLD ONLY BY

The Henry Martin Brick Machine Mfg. Co.,

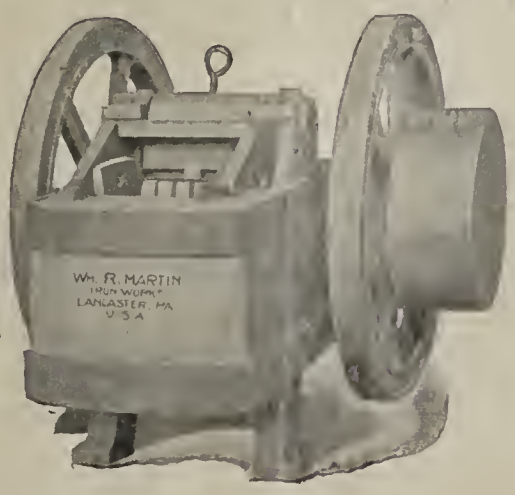
Lancaster, Pa., U. S. A.

Do You Have Our Catalogue No. 40?
If not, be sure and send for it.

Everything a Brickmaker Needs.

BRICK MACHINERY,
DISINTEGRATORS,
ROCK CRUSHERS,
DRY PANS, Etc., Etc.

- MOULDS,
- BARROWS,
- TRUCKS,
- KILN CASTINGS.



We Equip Complete Brick Plants.

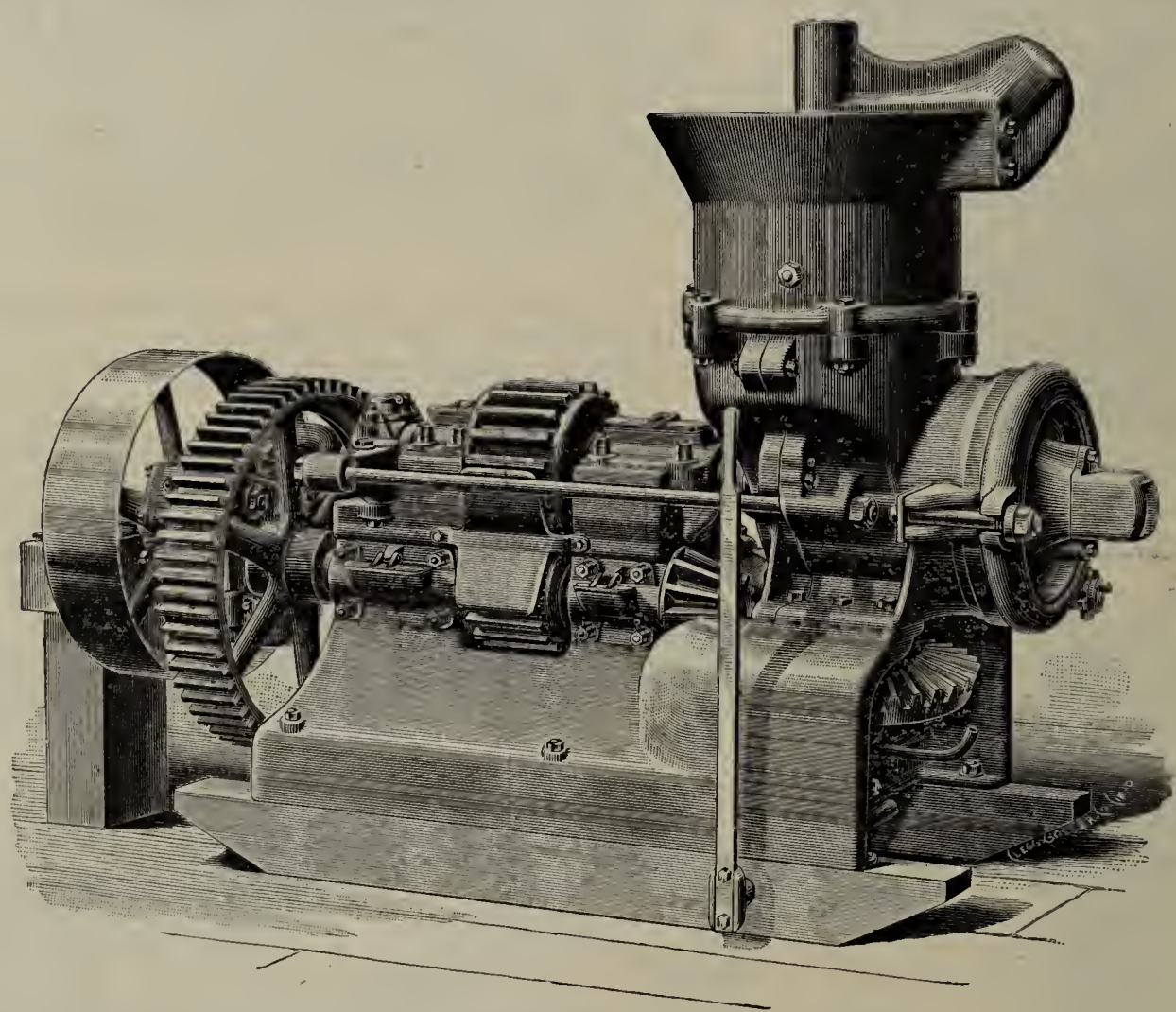
The "Wonder" and Prosperity,

Go Hand in Hand, as is Demonstrated by the Following Letter:

Deland, Ill., July 30, 1900.

WALLACE MFG. CO., Frankfort, Ind.

Gentlemen:—I wired you this p. m. send by American Express, bevel pinion O18 for Intermediate. This is the first break we have had on this mill since we put it in. I run it all last season and so far without one cent expense other than oil and a few bolts that holds the dies on. I have three good men and it gives them all they can do to keep enough clay to keep the mill running. I also have three off-bearers to take the ware



Intermediate Wonder Brick Machine.

and put it on the shelves. I am running 12 men this season. I put in a new 80 horse power boiler this Spring and have all the power that we need. We were making 9-inch tile to-day and let the dirt get too dry on us and broke three cogs out of the bevel pinion. It was not the fault of the mill, but our own by not tempering the dirt sufficiently.

Hope you will have sent the pinion before you receive this letter. R. B. MOODY.

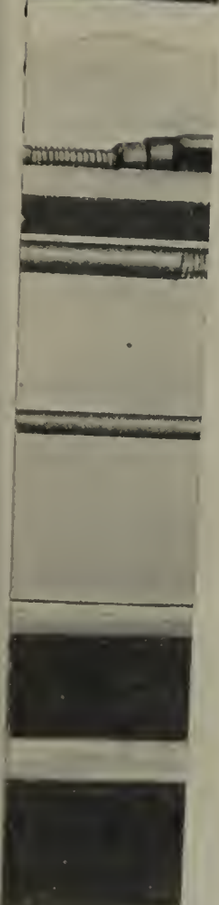
This is one of the many complimentary letters we receive as to the merits of our Brick and Tile Machinery.

The Wallace Mfg. Co.,

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

Frankfort, Indiana.

SOUTHERN MACHINERY CO., Charlotte, N. C., **Agents for Tennessee, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina and Virginia.**

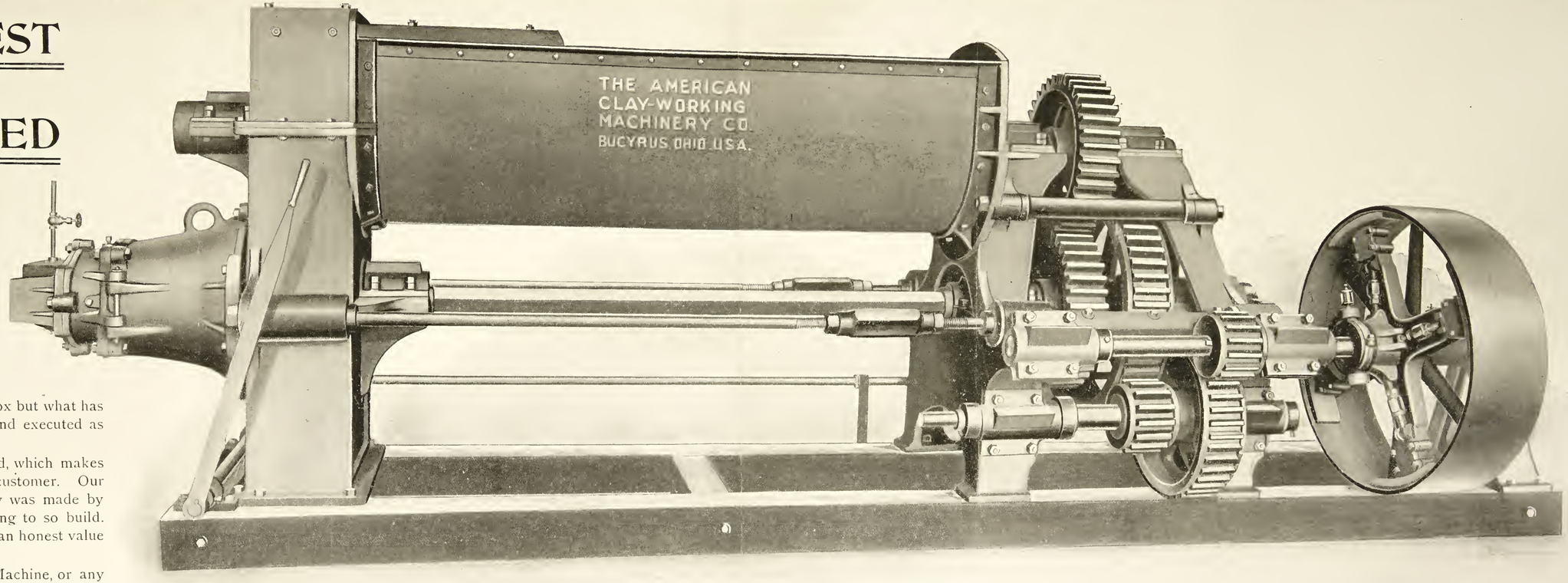


ned A

nches in dia
ng Shaft is
clutch pu
re steel. H
r hour.

G M

THE GREATEST OF ALL COMBINED MACHINES.



Not a pound of metal skimped.
Not an ounce of weight wrongly placed.
Not an item of strength lost sight of.
Not a slip-shod piece of workmanship in it.
Not a flaw in the material.
Not a better investment in machinery anywhere.
Not a bolt, bar, cog, nut, bearing, pinion or box but what has been as carefully considered, planned and executed as though it were the whole machine.

It's these small details, carefully executed, which makes an honest machine and insures a satisfied customer. Our reputation for building THE BEST machinery was made by DOING IT, and will be maintained by continuing to so build. You run no risks—every machine is as much an honest value as though it were the coin of the nation.

If you're in the market for a Combined Machine, or any other Clayworking Machinery, you'll get the best value for your money by buying the "Built Right, Run Right" line. We make everything in

DRY PRESS, STIFF MUD and SOFT MUD MACHINERY and APPLIANCES.

Write for Particulars.

NEW YORK OFFICE:
39 and 41 Cortlandt St., New York.

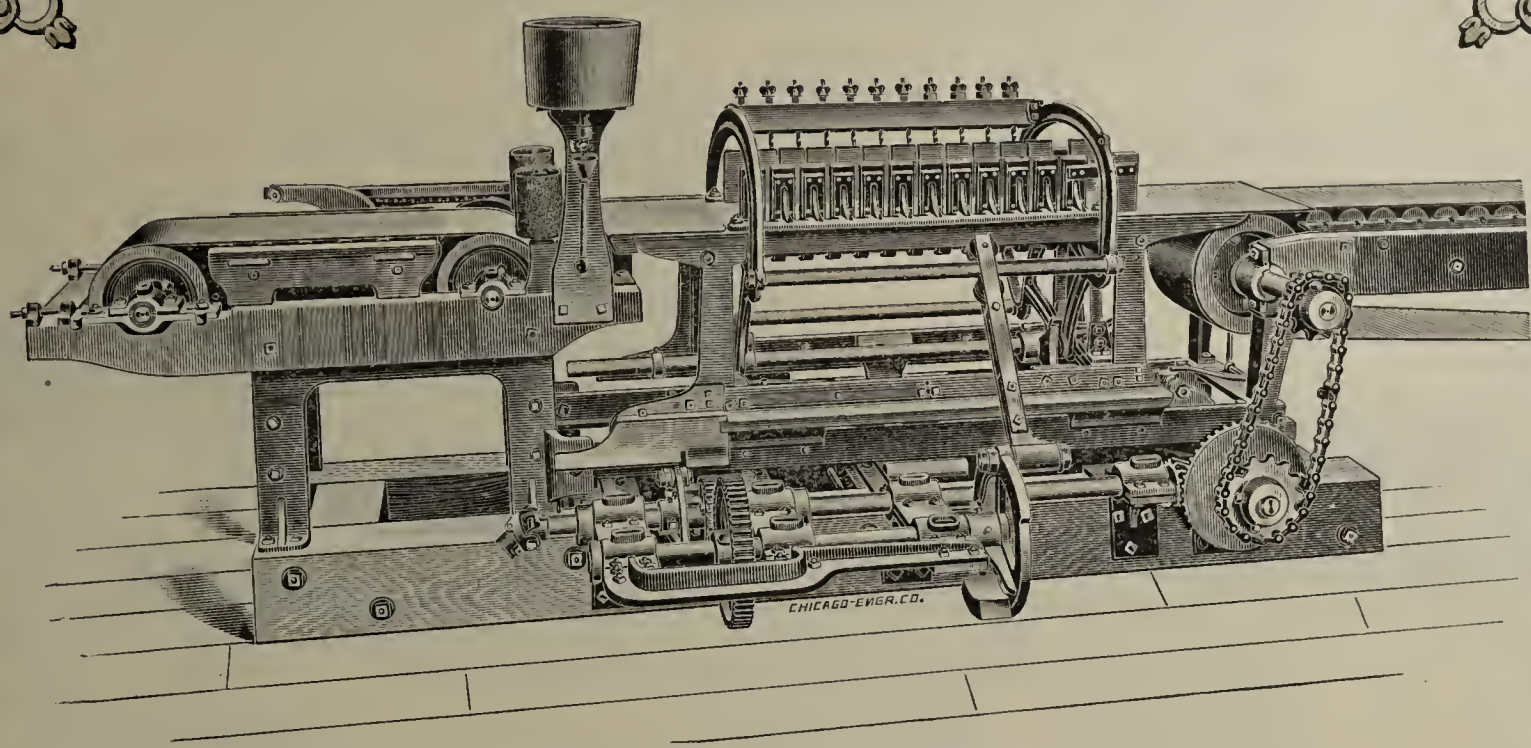
The Machinery That Never Disappoints.

No. 2 Combined Auger Machine and Pug Mill.

This Machine is adapted for making tile from three to twenty inches in diameter, hollow building blocks, fire proofing, brick, etc. The Pug-Mill is made of steel boiler plate one-fourth inch thick, ten feet long and 24 inches in diameter. The Mixing Shaft is made of forged steel and is supplied with steel Mixing Knives. The Auger Shaft is made of forged steel. The Machine is double geared, and provided with our friction clutch pulley, 42 inches in diameter, 12-inch face. Speed, 200 revolutions per minute. Power required, 25 to 30-horse. The gearing is extra heavy and strong. All pinions are steel. Height, five feet, four inches. Length, 21 feet. Width, over all, six feet. Weight, 14,000 pounds. Capacity, from 2,500 to 4,000 brick, or 1,000 to 2,500 four-inch tile per hour.

BUILT RIGHT, RUN RIGHT.

The AMERICAN CLAY=WORKING MACHINERY COMPANY, Bucyrus, Ohio, U. S. A.



The BREWER No. 60 AUTOMATIC CUTTER.

THE BRICKMAKERS are the fellows who can tell you about this Machine. They know because they've been there; right in that muddy practicability, where all the sentiment in a well written advertisement is destroyed; right where sentiment is put aside for actual demonstration.

We have reference to our **No. 60 Automatic Brick Cutter** illustrated above. It does the business, does it well, and doesn't make any noise about it. It is sold on its merits and we should be pleased to refer you to some of the practical brickmakers who know all about it.

H. BREWER & CO.,

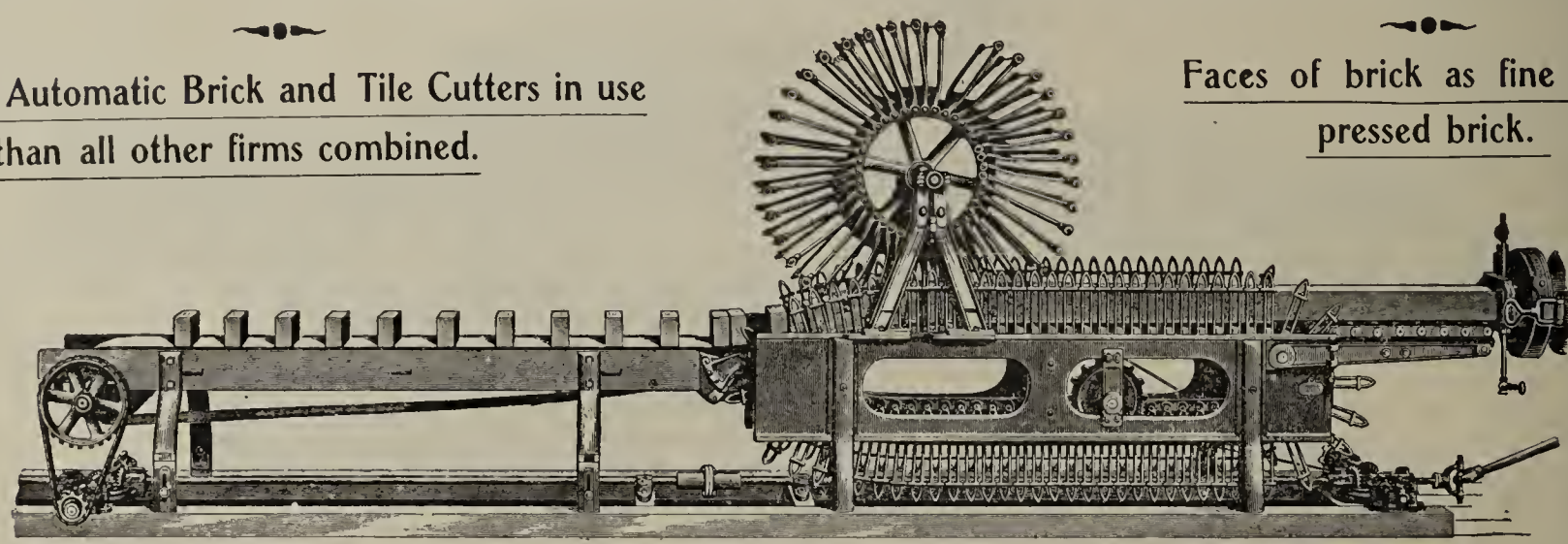
TECUMSEH, MICH., U. S. A.

PROGRESSIVE BRICK MAKERS

Are not easily deceived. They know the value of **points** like these—**Strength, Endurance, Reliability,** no "break-down," no "lay-off," but **every day** full capacity of **brick of guaranteed quality.**

More Automatic Brick and Tile Cutters in use than all other firms combined.

Faces of brick as fine as re-pressed brick.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Lancaster, Ohio, June 25th, 1900.

J. D. FATE & CO., Plymouth, Ohio.

Dear Sirs:—I presume you are wondering how we are coming on with Brick Table. Well, we are cutting brick all right. We had to reverse the motion to suit the mill, a thing I did not think of when ordering, asi e from that we made no other change. We have made about 100,000 brick since setting up table, and are more than satisfied with it. If it continues to do good work as it does (and I feel sure it will) I would not part with it under any consideration if I could not get another.

Inclosed you will find my check for balance due you, and accept my thanks for your efforts in interesting me in the table. Respectfully, W. B. HENRY.

Montreal, Canada, May 3rd, 1900.

J. D. FATE & CO., Plymouth, Ohio.

Gentlemen:—The Automatic Side-cut Table we purchased from you has now been running three weeks and is giving the best of satisfaction, I had a little trouble the first few hours in getting it adjusted, as well as from everything being new and stiff. As soon as it got limbered up we had no trouble. It does not take one tenth the oil our old table used. We have not yet tried the belt for large sized brick; however, I do not anticipate any trouble from that source. Your table will cut any clay when it does ours so successfully, as our shale is very hard to reduce to powder, therefore, it is very coarse and very short. We have made no mistake in putting in your table. We are making 45,000 to 50,000 brick per day, and as far as the table is concerned it is only limited to the capacity of the Brick Machine, and needs no expert to run it. We will be quite willing to show your table to any one that may visit us for that purpose, as I hope to make 100,000 per day this season.

LA PRAIRIE BRICK CO.
WM. BAILLIE, Supt.

The manufacturers of this table do not guarantee it to do as good work as any other, but BETTER WORK—they guarantee it to deliver on the off-bearing belt, better, smoother faced, sharper edged brick than can be produced by any other brick cutter ever made.

A full line of "Stiff Mud" Brick Machinery.
Also "Soft Mud" Brick Machinery, both Steam and Horse Power.
Write us for Catalogue of the **best** brick machinery built.

J. D. FATE & CO.,

Manufacturers of

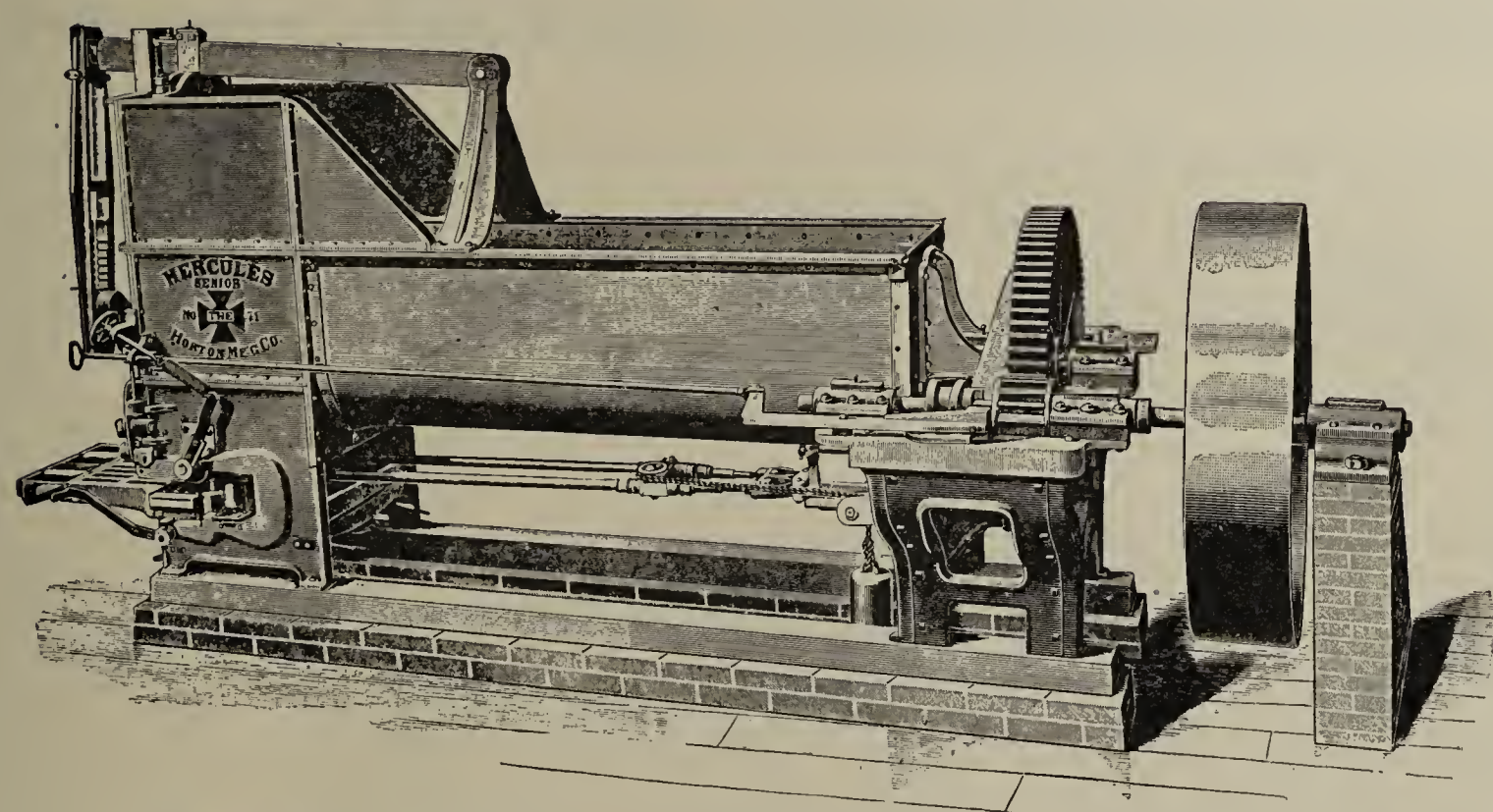
BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.
Agent for Virginia and North Carolina: H. L. JACOBS Suffolk, Va.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES

RON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brickyard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

Now Will You Be ....Good....

ONCE MORE the **Potts Patents** on **Clay Disintegrators** are delared to be good and valid. That all machines using adjustably secured or solid bars cast to the roll, are infringements of the Potts Patents.

It is now only a matter of a short time until all manufacturers of these infringing machines will be prohibited from manufacturing or selling the same.

Don't let this trouble you as **C. & A. Potts & Co.,** are still in the business, and will furnish all the Disintegrators wanted. You will never have to go back to the old and expensive rolls.

The manufacturers of these infringing Disintegrators have the past six years told you the Disintegrator was the machine for you to use, if this was the case then it must be so now.

Remember the Disintegrator is the only machine ever made that will work any kind of clay direct from the bank and not choke or clog—it will grind the small stones and separate the large ones, it does not pack the clay into thin hard sheets, but leaves it in a loose open condition, so it will take water quickly and is easily pugged. It saves labor and improves the quality of Brick or Tile.

For prices write

C. & A. POTTS & CO.,
Indianapolis, Ind.

CHAMBERS BROS. CO., Philadelphia, Pa.,
Are the only Licensed Manufacturers.

BRICK MANUFACTURERS CANNOT AFFORD TO IGNORE THE SPLENDID QUALITIES OF THE CLAYWORKING MACHINERY MANUFACTURED BY **C. & A. POTTS & CO.**

Horizontal Stock Brick Machines.

All Iron or Wood Frame.

PUG MILLS, DISINTEGRATORS, MOULD SANDERS, and all Brick-yard Supplies.

They have invariably become recognized leaders in every locality, invincible in the yards and in all contests, winning their way by fine work and lasting qualities and positive economy. They are up-to-date, progressive machines, with all the latest improvements. Well Built, Strong and Durable.

There have been more Potts Machines sold this season than ever before fully one-half of which have gone to yards to replace machines which were sold last season because they were "just as good" as the Potts, and cheaper.

Reese-Hammond Fire Brick Company.

Capital Stock $500,000. **Annual Capacity, 50,000,000.**

BOLIVAR, PA., June 26, 1900.

C. & A. POTTS & Co., Indianapolis, Ind.

Gentlemen:—We have your esteemed favor of the 22nd, in reply we are pleased to state that the reports we have received from your machine are most gratifying. From the reports of our superintendent the results are entirely satisfactory, and we can assure you that it gives us great pleasure to be able to make such a report to you.

Yours respectfully,
REESE-HAMMOND FIRE BRICK CO.

THE ABOVE LETTER IS FROM A VICTIM WHO TRIED ONE OF "THE JUST AS GOOD" MACHINES LAST SEASON. LET US TELL YOU WHY THEY MADE THE CHANGE.

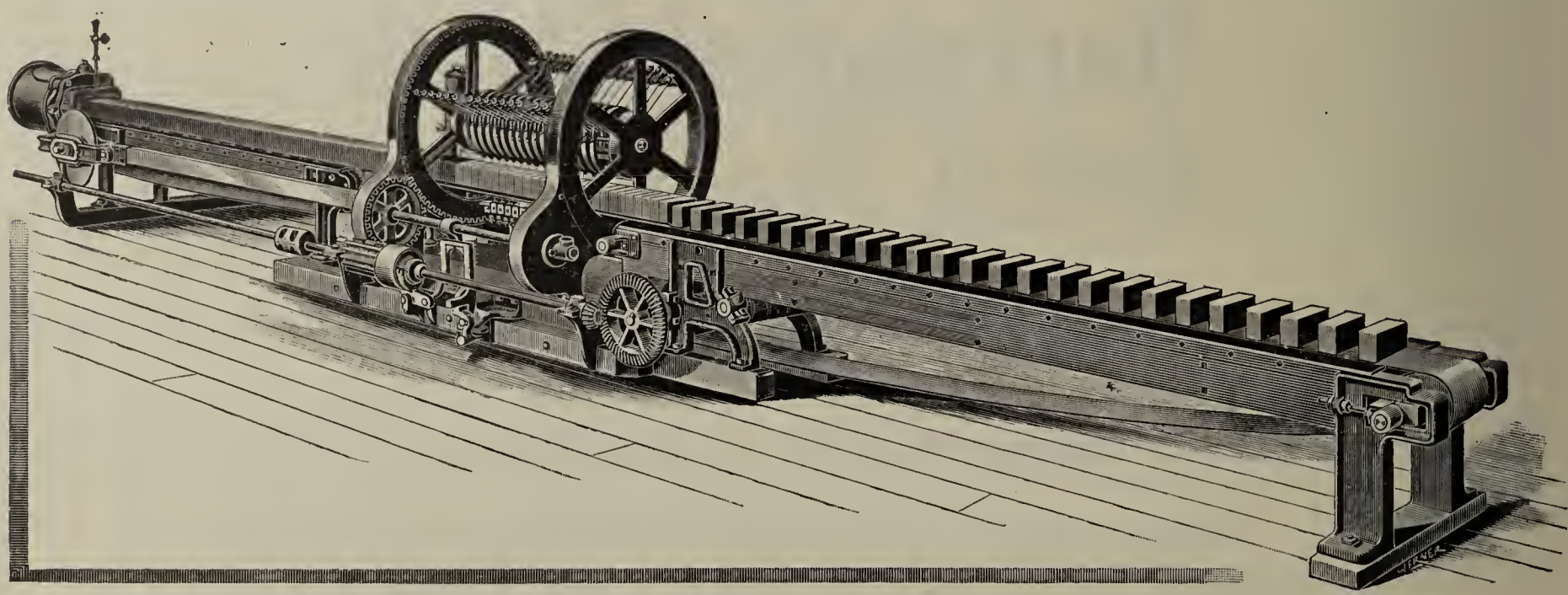
C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE

INDIANAPOLIS, IND.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

POINTS.

Of simplest construction. Entirely automatic and positive in operation.

A combined downward and lateral movement of the wires insures brick with **smooth edges.**

The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.

Cutting wires are short and make a square and straight cut.

New wires easily put on without stopping, stooping or poking end of wire through a hole.

More than twice as much time is afforded for renewing wires as in other cutters.

Movement of all parts is slow.

Clay does not propel cutting wires.

No auxiliary or friction belts used.

No tensions to regulate.

No regulation or adjustment required.

No crank or pitman rod used.

No reciprocating wire frame used.

No machinery underneath.

Absence of all complicated gearing.

Cannot miss a cut or cut a crooked brick

All the brick are of the same thickness.

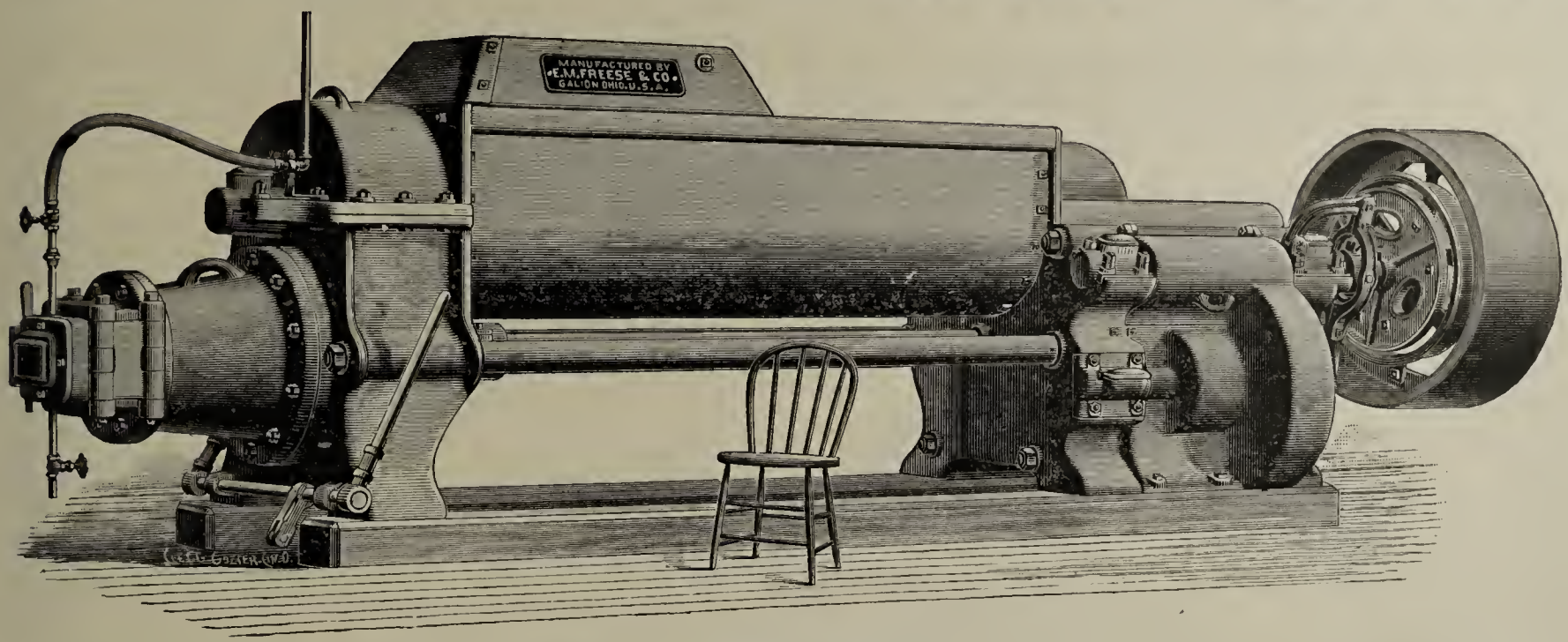
Substantial and durable in all parts.

Capacity ample for any brick machine.

E. M. FREESE & CO.,

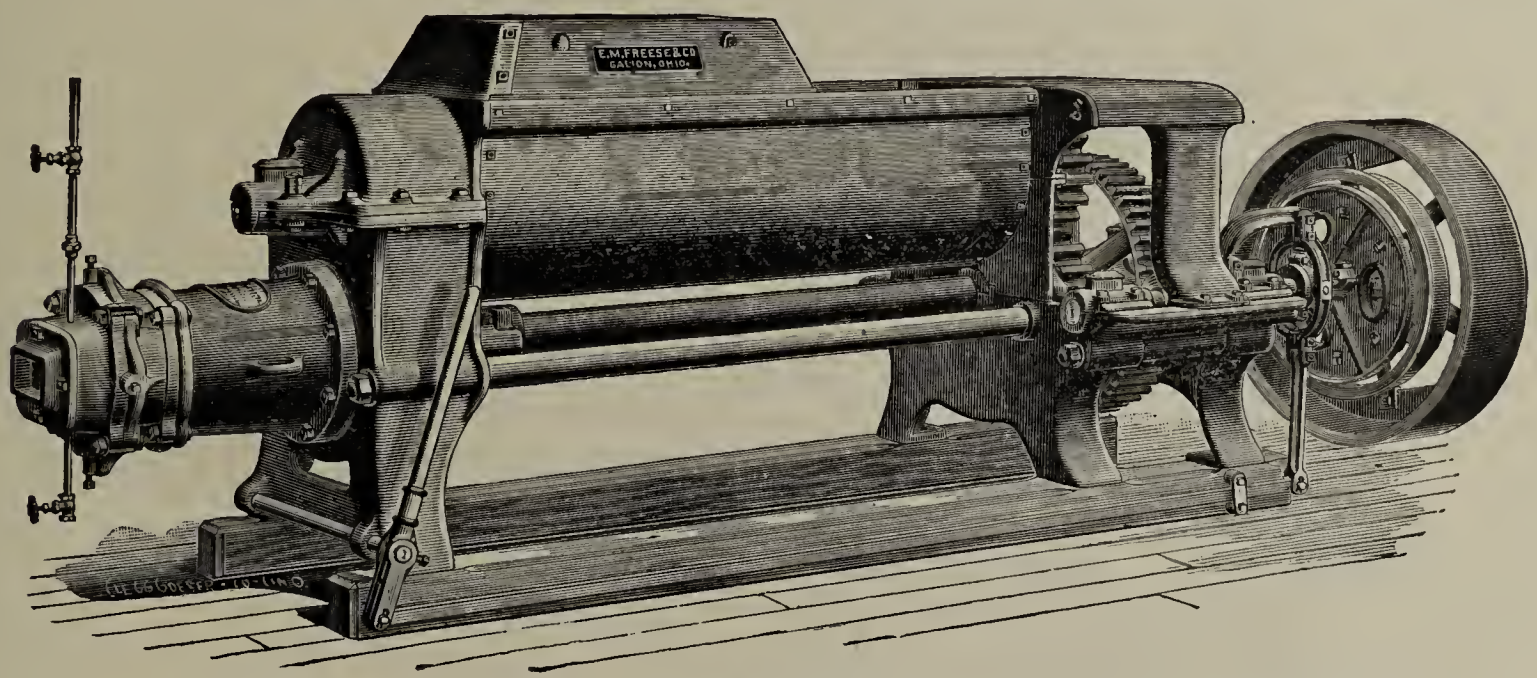
Galion, Ohio.

The Original Union Brick Machines



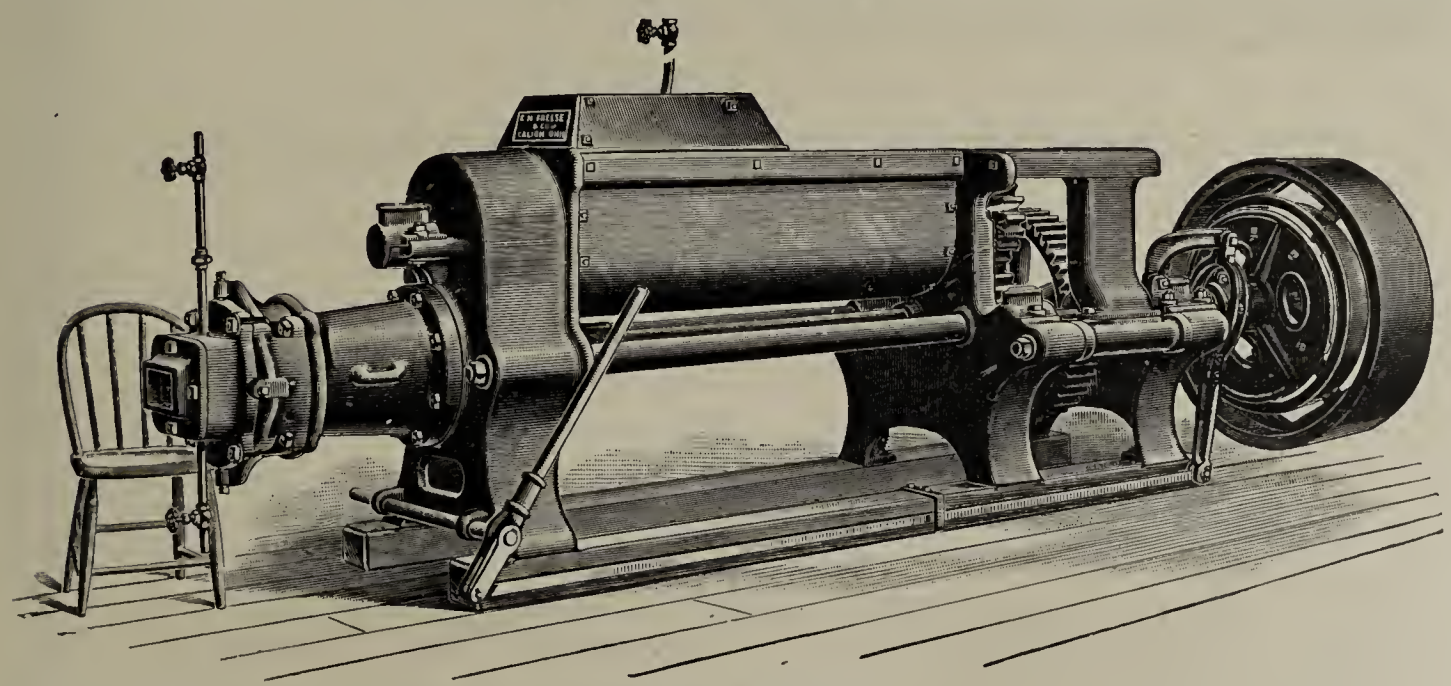
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

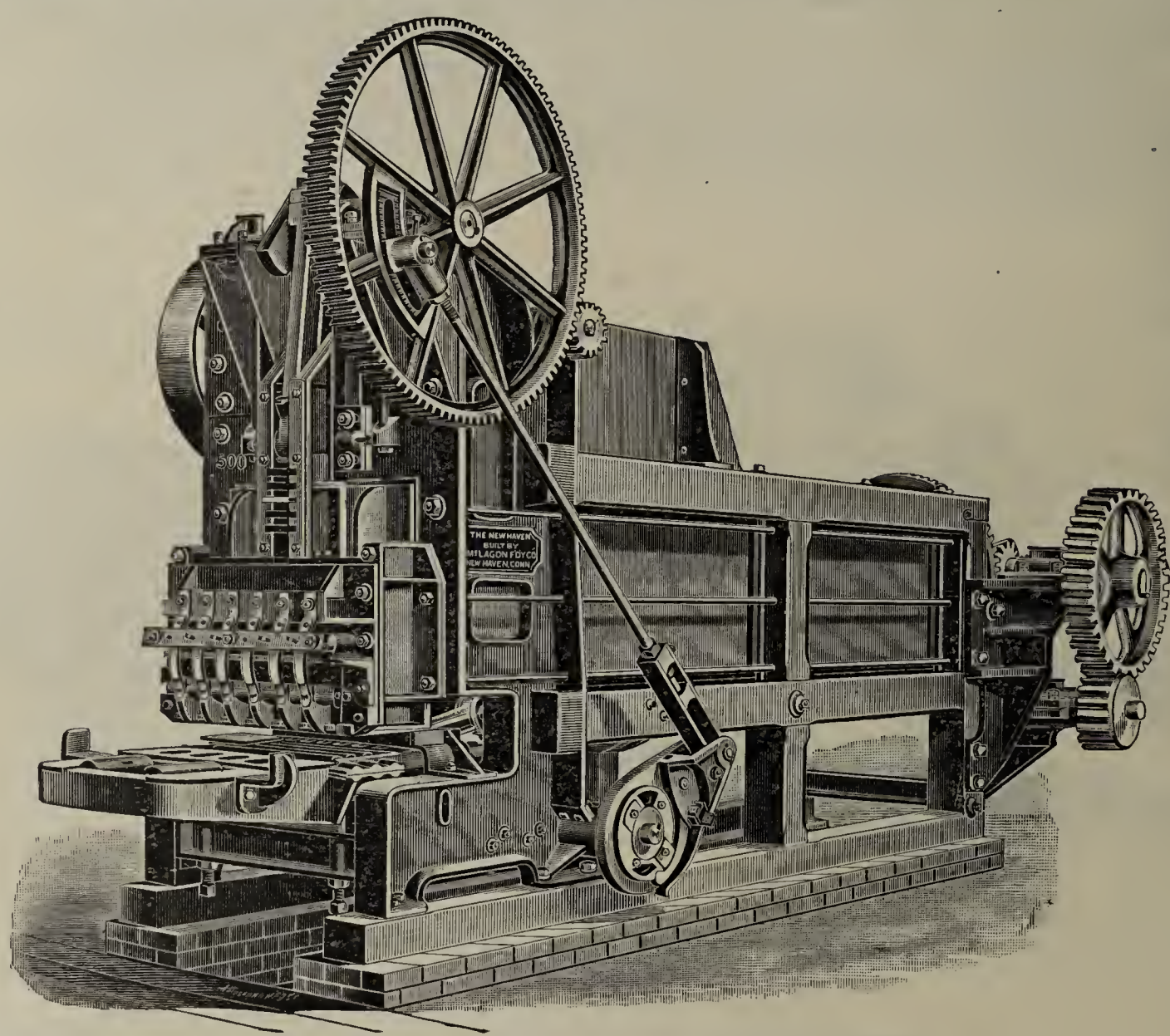
They are a SUCCESS Investigate them.

No separate Pug Mill required.

E. M. FREESE & CO., Galion, Ohio.

"The Lamp of Experience."

Which we published recently and which may be "HAD FOR THE ASKING"
Is full of Interesting Facts for Brickmakers. Note the Quotation below.



AFTER TEN YEARS.

Lebanon, N. H., October 12, 1899.

The EASTERN MACHINERY CO., New Haven, Conn.

Dear Sirs:—I have just COMPLETED MY TENTH YEAR with machine, and IT HAS DONE JUST AS GOOD WORK AS THE FIRST YEAR. It is PERFECTLY SATISFACTORY. Yours,

JASON DENSMORE.

"NEW HAVEN" Brick Machinery is Sold Exclusively on its Merits.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

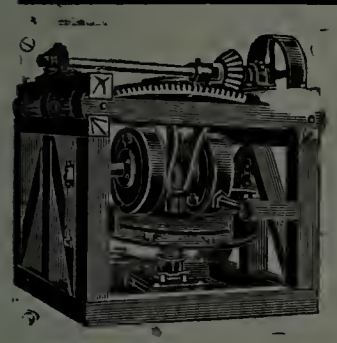
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

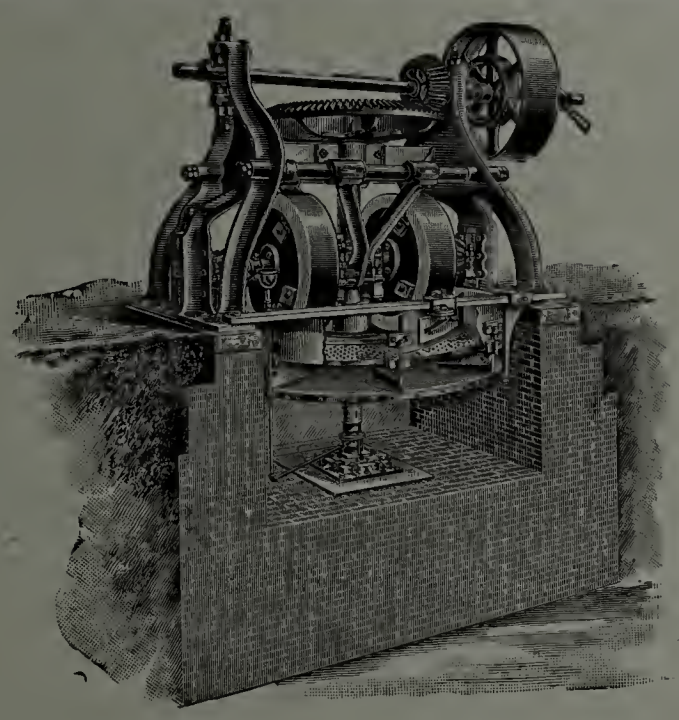
MANUFACTURERS OF

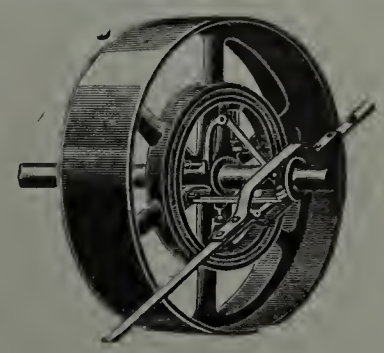
Brick Machinery.

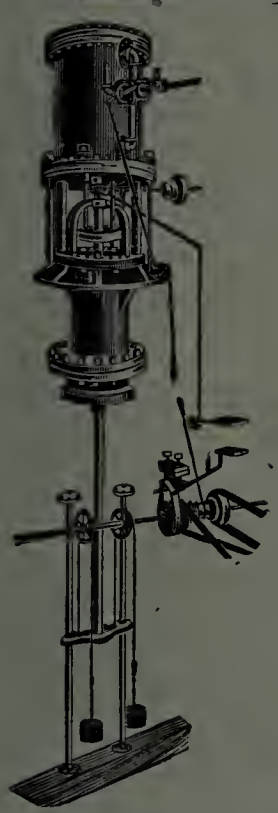
COMPLETE EQUIPMENTS.

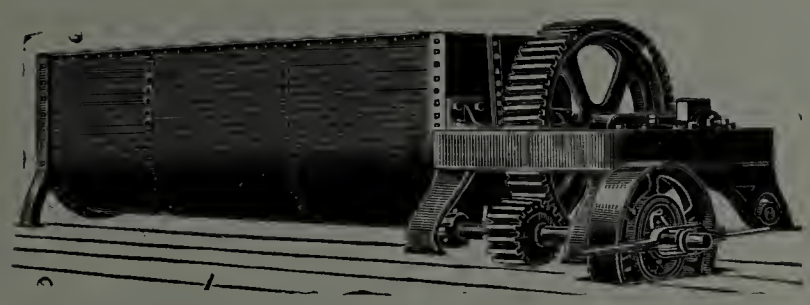
Tile Machinery











Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

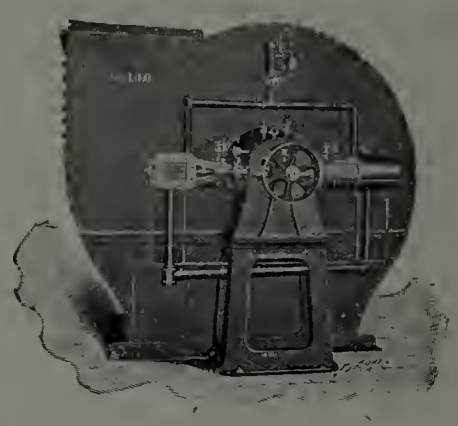
The ONLY SUCCESSFUL

Waste Heat Brick Dryer

...IS THE...

"A. B. C."

Read what Its Users Say of It.



The Iowa Brick Co., Des Moines, Iowa., write as follows:

"In regard to the Blower outfit recently furnished us by your company for utilizing the waste heat from our cooling Kilns, we wish to say that it gives better satisfaction than we anticipated. The special construction of the Blower is very desirable. We have tried various steam dryers, but this is so much more satisfactory that we would not put one in again if the company would furnish it for nothing and pay for operating it. We would recommend the Blower System to everyone who wishes to dry brick at one-fourth the cost of the steam system."

American Blower Company,

Detroit, Michigan.

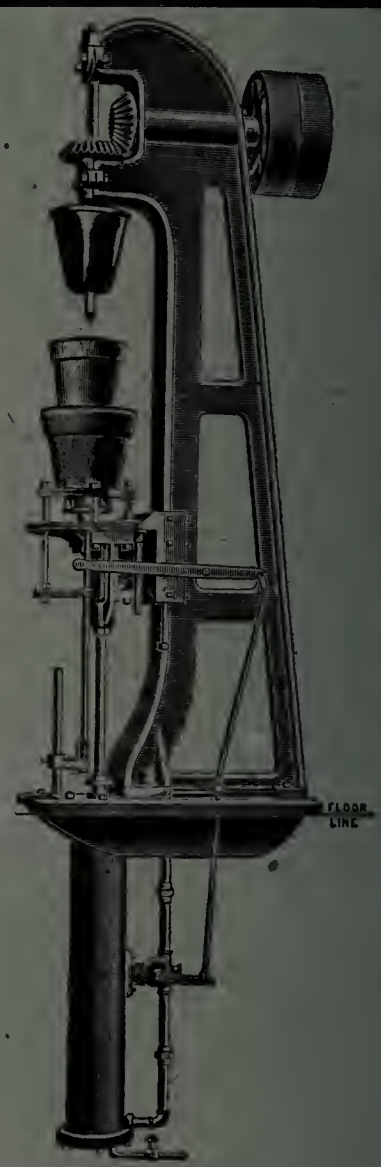
New York. Chicago. London.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS, OHIO, U. S. A.

MANUFACTURERS OF ALL KINDS OF

Clayworking Machinery.



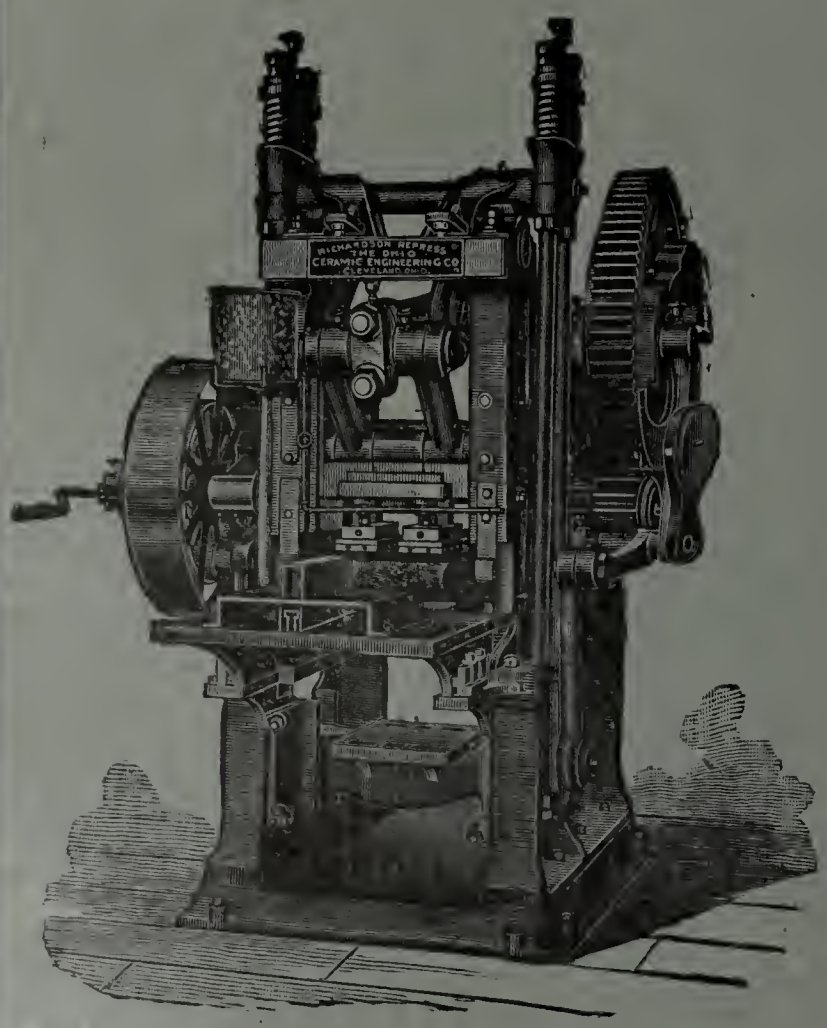
The accompanying cut shows our improved machine for making

Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

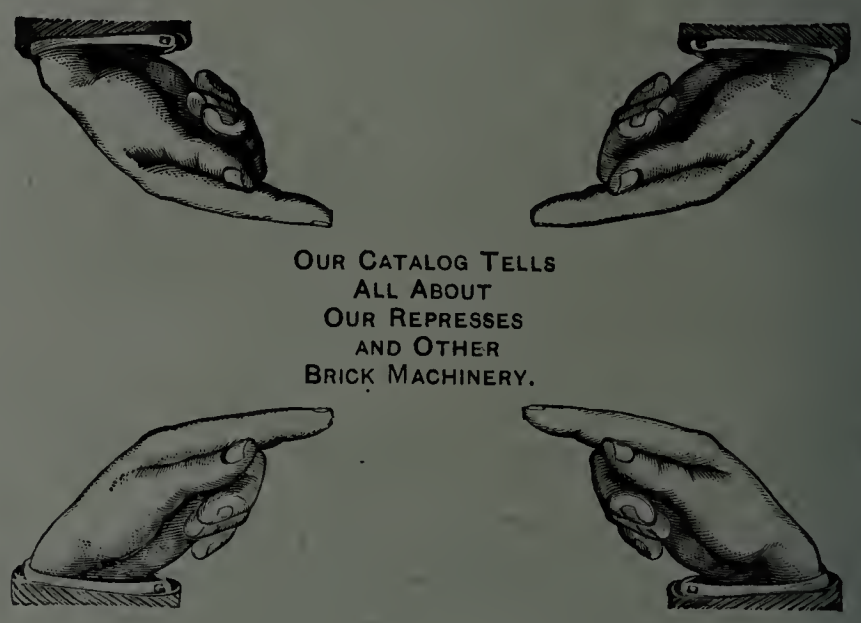
We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



The RICHARDSON REPRESS.



OUR CATALOG TELLS ALL ABOUT OUR REPRESSES AND OTHER BRICK MACHINERY.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

The Ohio Ceramic Engineering Co.,

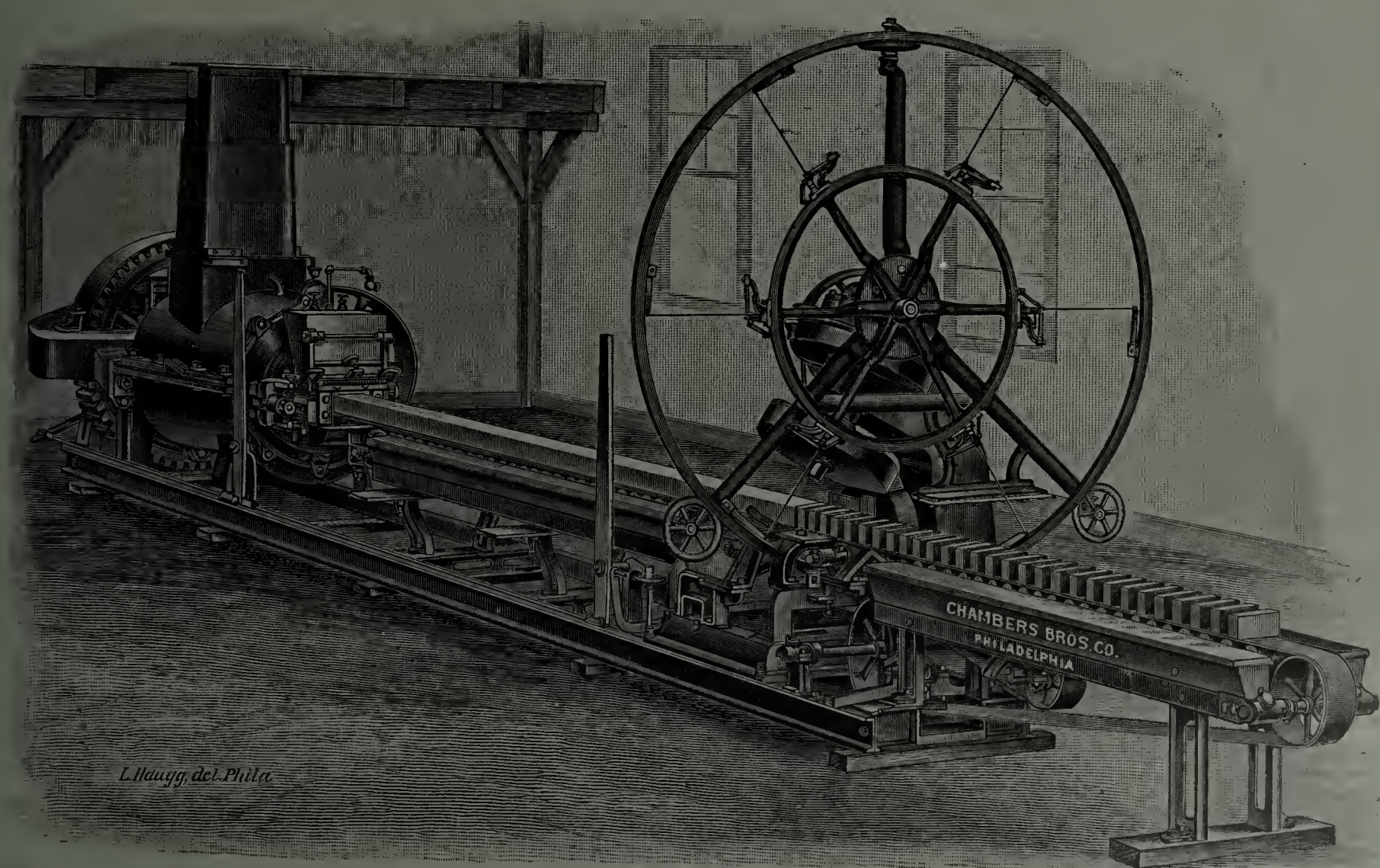
Cleveland, Ohio.

Table of Contents, Page 215.

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIV, No. 3. INDIANAPOLIS, IND. SEPTEMBER, 1900 $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

PHILADELPHIA, PA.

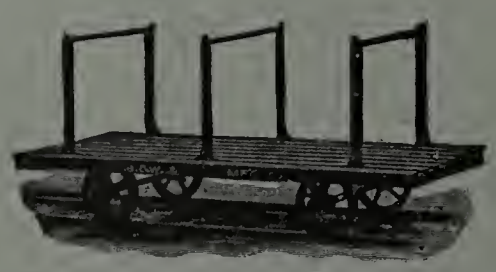
J. E. EASTES, Chicago Agent,
171 South Canal Street.

The Atlas Bolt & Screw Co., Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

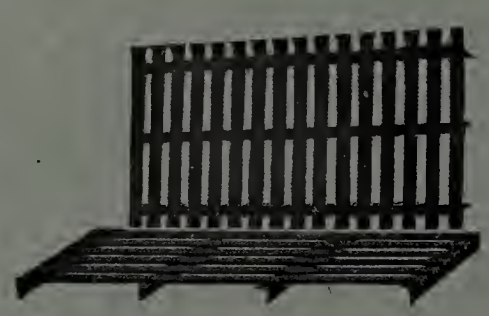
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

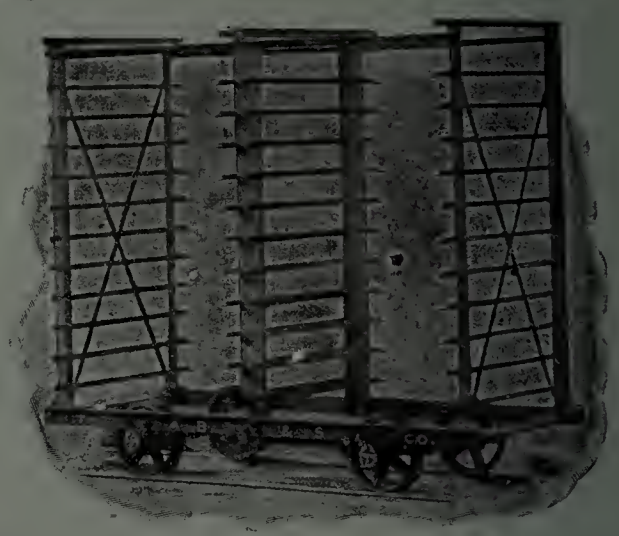
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet 7 inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name. Page.

American Clay-Working Mach Co, The. 173 221 243
Anderson Foundry and Mach. Works 172
Chicago Brick Machinery Co .. 174
Chisholm, Boyd & White Co... ..
Fernholtz Brick Machinery Co. The 175
Progress Press Brick and Machine Co..... ..
Ross-Keller Brick Machine Co ..

Brick and Tile Machinery.

American Clay-Working Mach Co., The 173 221 243
Anderson Foundry and Mach. Works..... 172
Baird and Son, H. C..... 229
Battenfeld Mfg. Co, The 223
Brewer. H. & Co..... 251
Chambers Brothers Co..... 169
Chicago Brick Machinery Co... 174
Eastern Machinery Co, The.... 250
Fate & Co., The J. D..... 244
Freese, E. M. & Co..... 248, 249
Henry Martin Brick Mach. Mfg Co, The 241
Hensley, J. W..... 171
Horton Mfg Co, The 245
Kells & Sons 229
Leader Mfg. Co, The..... 240
Madden & Co..... 228
Ohio Ceramic Engineering Co., The..... 252
Potts & Co., C. & A.....246, 247
Raymond Co., The C. W.... 216, 217
Stedman Foundry and Machine Works..... 175
Steele, J. C., & Son..... 237
Wallace Mfg. Co, The..... 242
Wellington Machine Co, The... 219
Wiles Co., A. M. & W. H 237

Brick Kilns and Dryers.

Alsip, S. H 232
American Blower Co, The..... 252
Barron, A. F 233
Bushong, M. M 239
Eudaly, W. A 239
Haigh, H 233
Illinois Supply and Construction Co, The..... 176
Morrison & Co., R. B 226
New York Blower Co., The.... 227
Phillips, S. G..... 232
Pike, E. M..... 232
Reppell, L. H 233
Swift, F. E 233
Standard Dry Kiln Co, The..... 178
Yates, Alfred..... 228

Brick Yard Supplies.

Atlas Bolt & Screw Co, The..... 170
Arnold, D. J. C 241
Borden & Selleck Co 226
Buhl Malleable Company..... 228
Cleveland Car Co..... 238
Caldwell & Son Co., H. W..... 231
Carmichael, T. W..... 229
Carnell, Geo..... 237
Coldewe & Co., G..... 227
Cox, Geo. S..... 226
Elder & Dunlap..... 227
Frost Engine Co 177
Harrington & King Perforating Co, The 171
Henry Martin Brick Machine Mfg. Co, The..... 241
Horton Mfg. Co, The..... 245
Jeffrey Manufacturing Co, The. 231
Kendall & Flick..... ..
Marion Steam Shovel Co..... 240
Main Belting Co 225
Mershon & Co., W. B 230
Newton, A. H..... 231
Newton A. C..... 231
Phillips & McLaren 226
Rockwood Mfg. Co, The..... 228
Smidth & Co., F. L..... 236
Turner, Vaughn & Taylor Co... 252
Vanduzen Co., The E. W 229
Wel s & Hall..... 229
Williams Patent Crusher and Pulverizer Co 236

Miscellaneous.

Big Four 231
Burt Manufacturing Co..... 215
Chesapeake & Ohio R. R..... 231
Clinton Paving and Building Brick Co., The..... 235
Coaldale Brick & Tile Co., The . 234
Cotton Belt Route 232
Dean Bros. Steam Pump Works 229
DeWit, H..... 238
Eastern Paving Brick Co..... 234
Engelhard, Charles 229
Evans & Co., Victor J..... 230
Evens & Howard 229
Gabriel & Schall..... 229
Green & Hunter Brick Co 234
Harper-Norton Shale Brick Co The..... 234
Indianapolis Engraving and Electro Co..... ..... 228, 229
Indiana, Decatur & Western ... 232
Lake Erie & Western..... 232
Laughlin Mfg. Co..... 230
McAvoy Vitrified Brick Co 235
Miller Oil and Supply Co 231
New York Brick and Paving Co 234
Osborne, W. R..... 228
Outing Mfg. Co..... 238
Preston Brick Co..... 235
Pennsylvania Line 231
Purington Paving Brick Co, The 235
Ripans Chemical Co..... 230
Sears, Roebuck & Co..... 228
Terre Haute Brick and Pipe Co. 235
Vandalia Line..... 230
Wabash Clay Co., The..... 235
Ads., Small Wanted, For Sale, etc.

Mention the Clay-Worker
WHEN WRITING TO ADVERTISERS
Mention the Clay-Worker

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

Samples or blue prints with prices furnished on request.

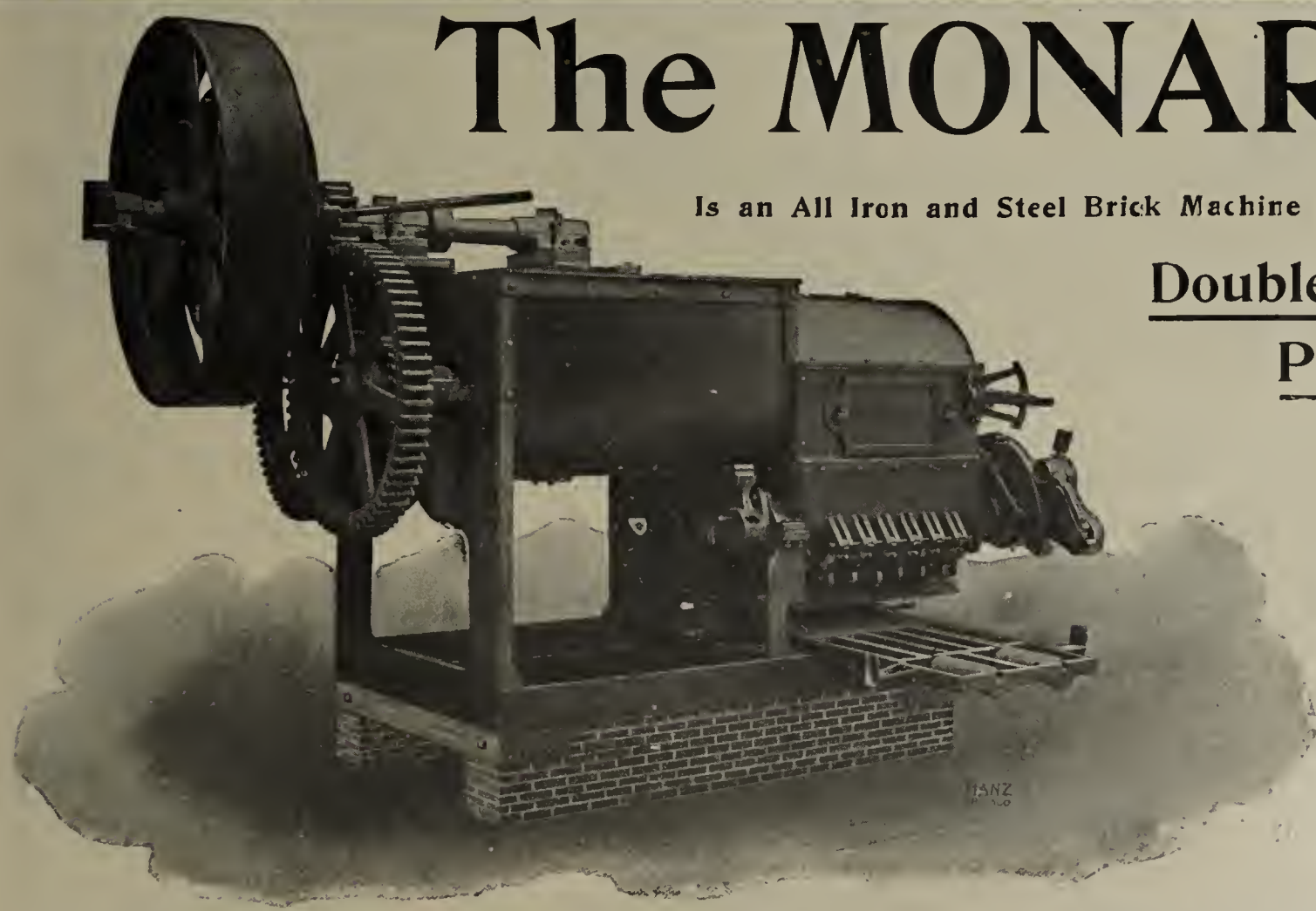
THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.

• • •



SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

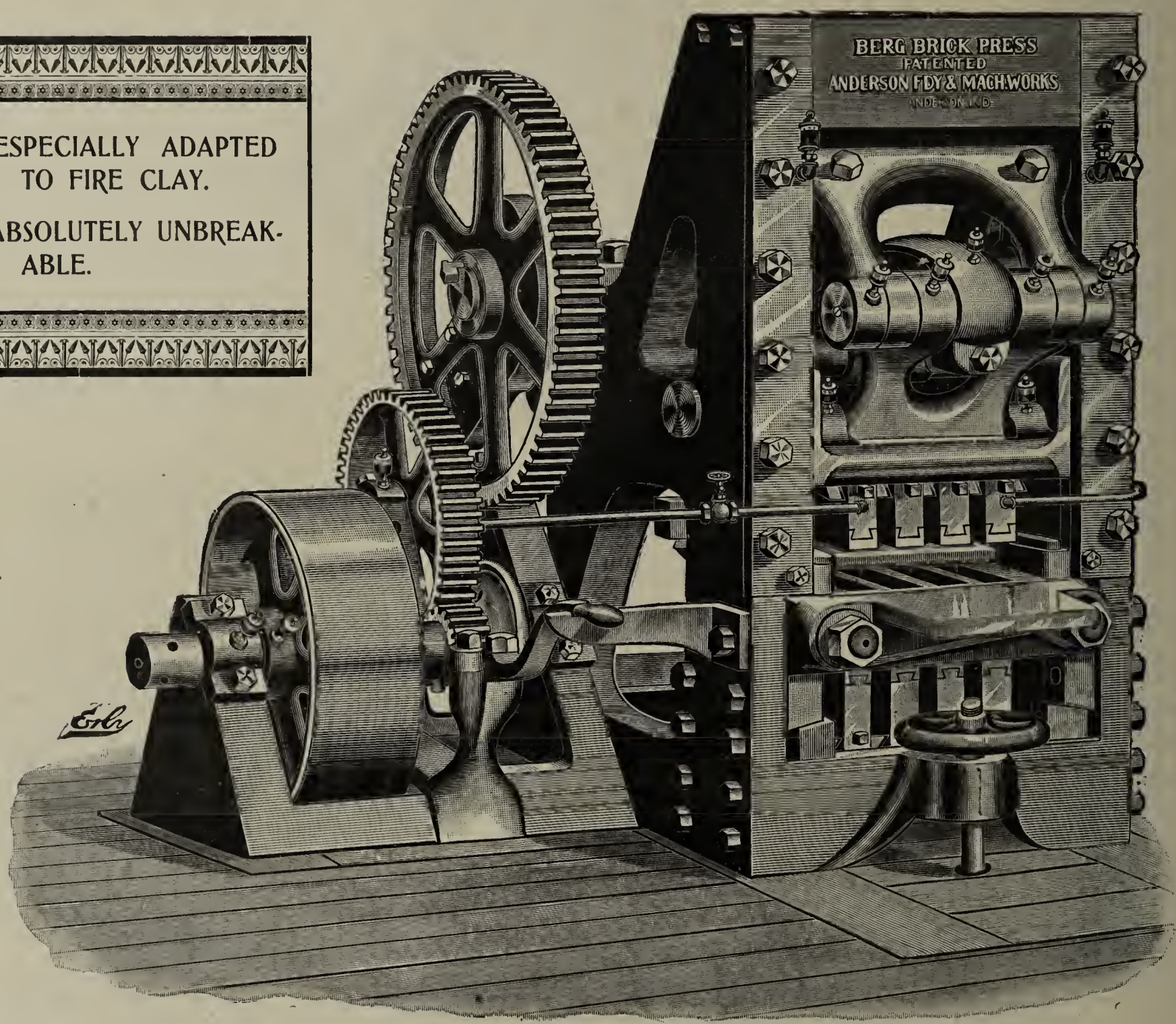
JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

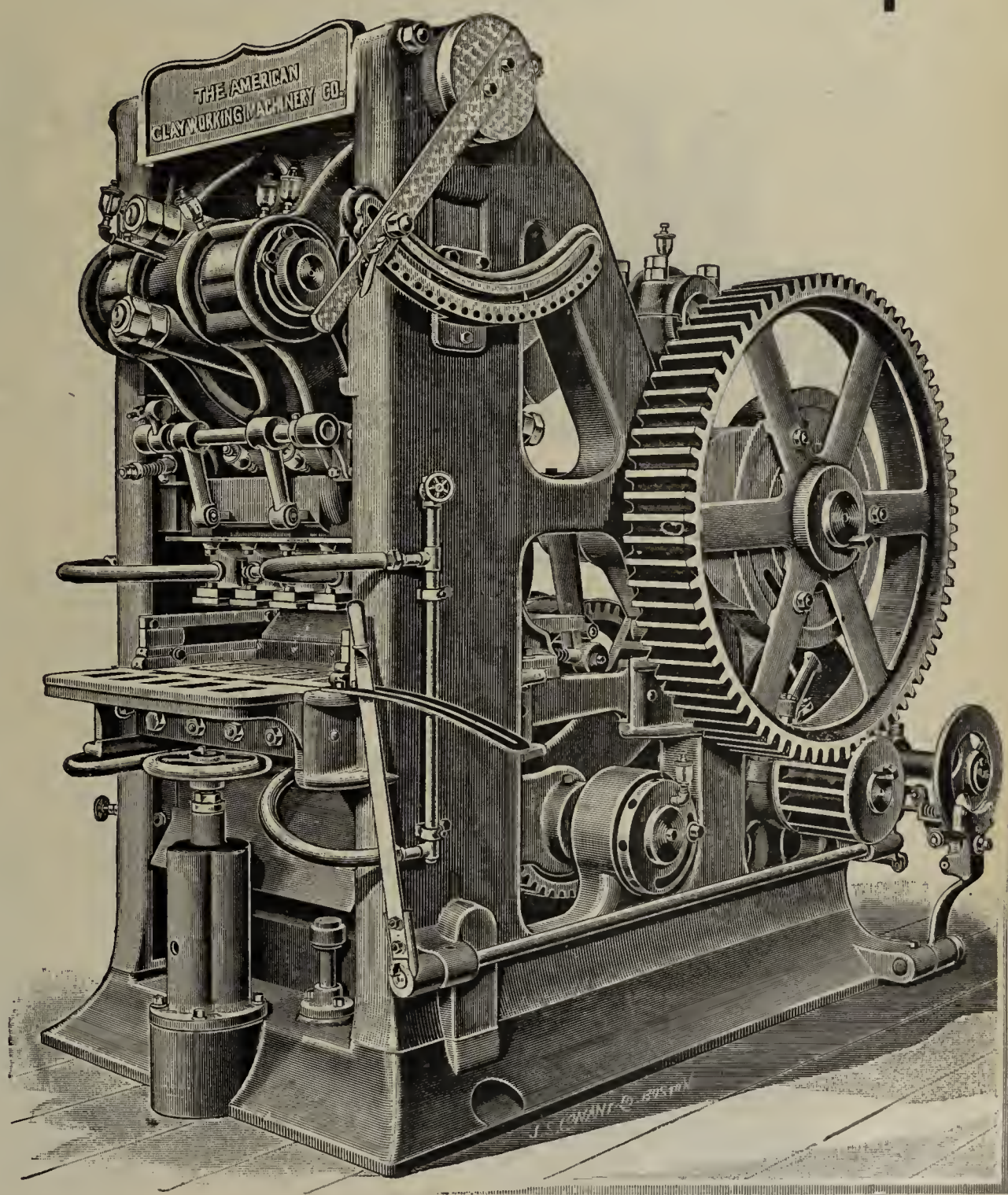
MANUFACTURED BY

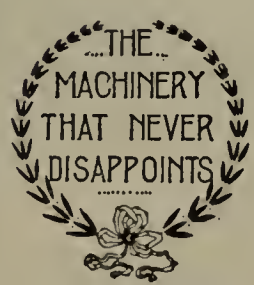
The Anderson Foundry & Machine Works,
Anderson, Indiana.

It's Up To You!

Built Right.
Run Right.

THE first requisite of a successful machine is the principle on which it works. No matter how good the making or material, no matter how alluring the price may be, if the principle is not good it is an undesirable machine, which will eventually land its owner in bankruptcy or the mad house and itself in the scrap heap. An investment in such machinery is little better than criminal. Look thoroughly into the market before you buy, then if you do not buy our machinery your misfortune will be an error of judgment only. We have kept a constant step with the clay business for half a century. The same exacting care which has kept us in the front rank of manufacturers is keeping us in the lead. Some of our most popular machinery is our dry press line. They're "Built Right and Run Right." If you are in the market write us. We build dry press, stiff mud and soft mud machines. Our complete catalogue for the asking.



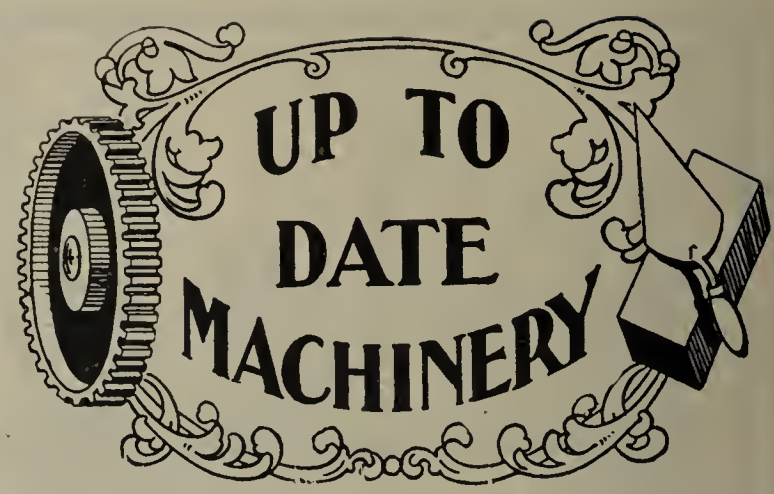


The American Clay-Working Machinery Co.,

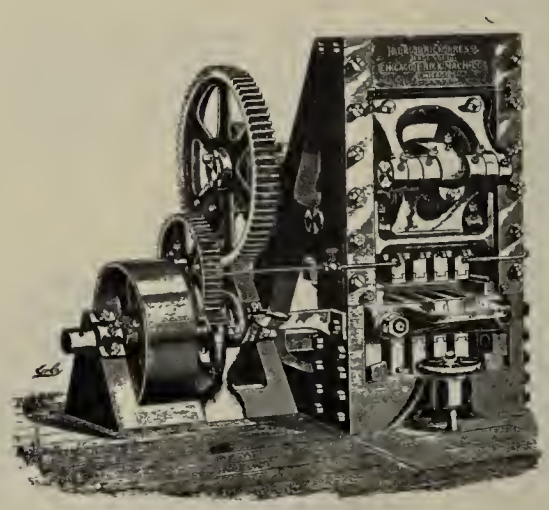
NEW YORK OFFICE:
39 and 41 Cortlandt Street.

BUCYRUS, OHIO, U. S. A.

When Buying a New Machine



Why not get it strictly **Up-to-Date.** In no other line of industry, excepting perhaps the electrical, has there been so many and such radical improvements during the past few years as in Clayworking Machinery. The dull times have been utilized to good advantage in perfecting our machinery, and the buyer of to-day gets the benefit. Why put in a Back Number, when an Up-to-Date Machine costs no more?

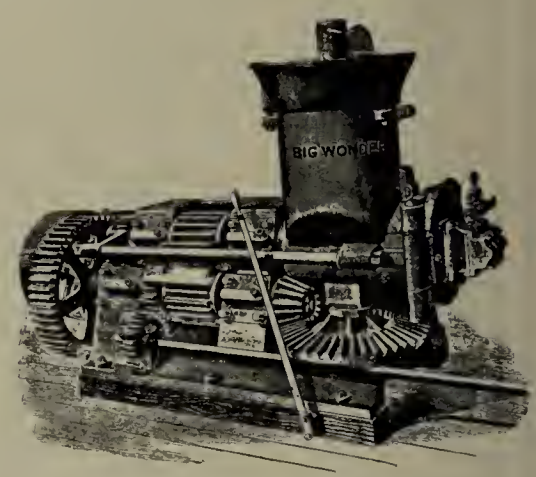


Dry Press Machinery.

Our BERG PRESS is the simplest and strongest of all Dry Presses. Three distinct pressures; absolutely unbreakable in pressing clay. Makes Shape Brick as easily as Standards, and is making in regular work blocks 18x13 inches. Specially adapted to Fire Brick and Fire Clay Shapes. **Fully Guaranteed** in every respect.

Send for Special Dry Press Circular.

Stiff Clay Machinery.

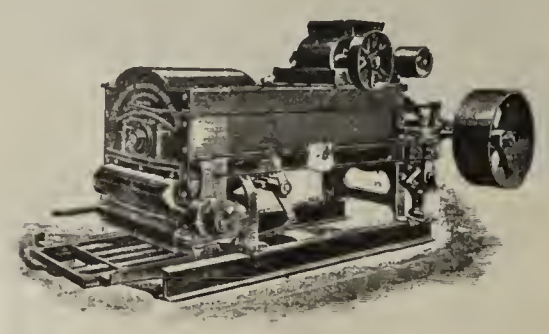


Our WONDER BRICK & TILE MACHINE is the most modern and improved type of Auger Machinery. Turns clay at Right Angles while in motion, breaking up and destroying laminations. Specially designed dies and augers to prevent laminations. Works many clays that cannot be worked on other auger machines.

Built in four sizes, capacities up to 100,000 per day. Makes Drain Tile equally well and equally rapidly.

Full Line of Cutting Tables, Crushers and Stone Separators, Pug-Mills, etc., adapted to all kinds of clay.

Send for Special Illustrated Catalogue.



Soft Clay Machinery.

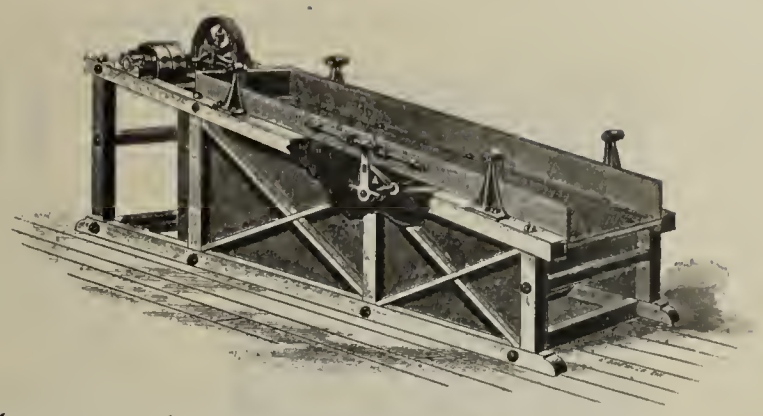
Our HORIZONTAL COMBINATION MACHINE is the latest and highest development of the Soft Clay System for making Sand Molded Brick. Works clay direct from bank, doing away with all soak pits and tempering.

We also have Upright Machines for working clay that has previously been soaked, and Horse Power Machines for small yards.

CHICAGO BRICK MACHINERY CO.,

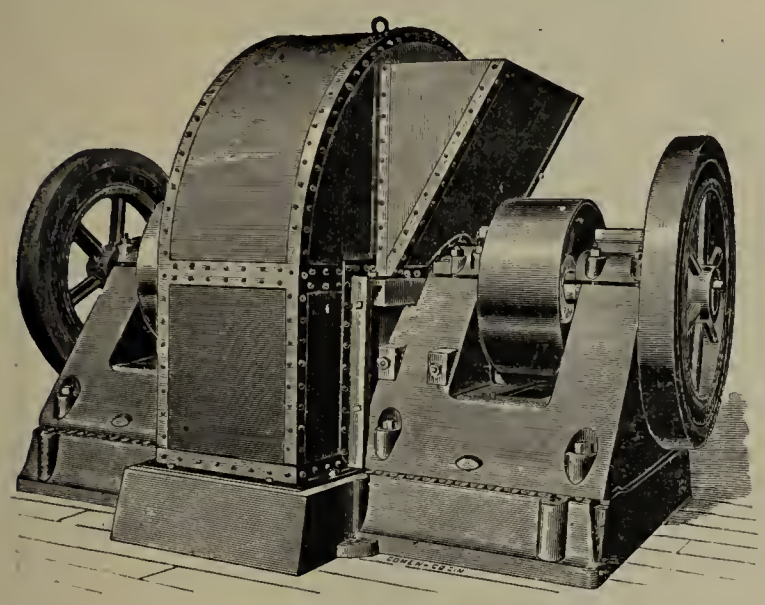
Send for Illustrated Catalogue. **225 Dearborn Street, CHICAGO, ILL.**

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.



A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

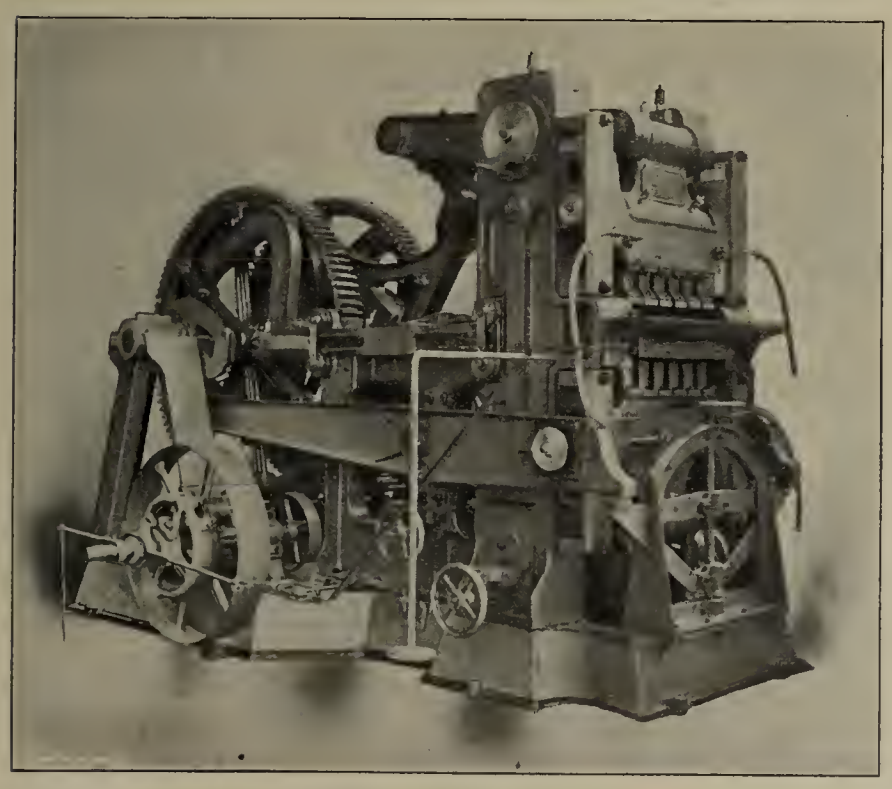
Write for catalogue, giving full description, references and testimonials.

Stedman Foundry & Machine Works,

AURORA, INDIANA.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, SIMPLICITY and SERVICE.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market.

All parts subject to strain are made of the best Bessemer steel.

Fitted with the Fernholtz Mold Box. Undoubtedly the leader.

We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer**, and the **Fernholtz Clay Mixer**, in our own factory.

Dealers in Brickyard Supplies.

PARIS, TEXAS, March 13, 1900.

THE FERNHOLTZ BRICK MACHINERY CO., St. Louis, Mo.

Gentlemen:—We are in receipt of your inquiry in regard to our Brick Machine, and in reply beg to say that we have been operating machine regularly for five years, and the repairs on same have been about $50.

We consider this a very good record and will take pleasure in recommending it to anyone who is interested in Brick Machinery.

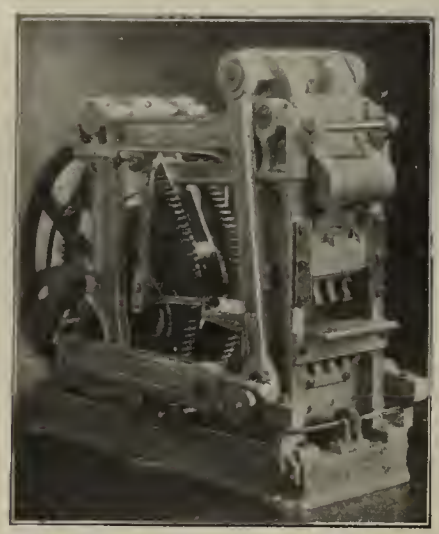
Very truly yours. CARTER & ROLLINS.
Per Carter.

Further Information on Application.

The Fernholtz Brick Machinery Co.,

CABLE ADDRESS "FERNBRICK." WESTERN UNION CODE.

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

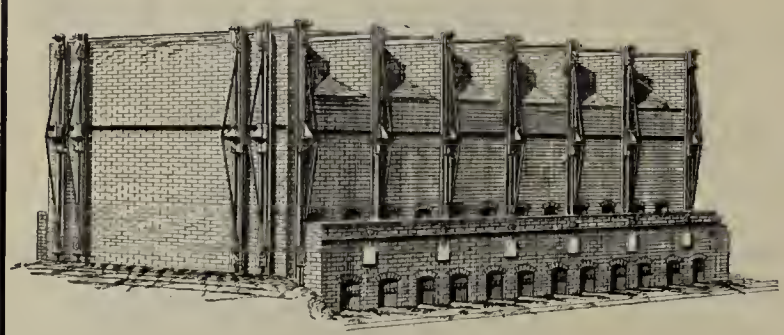


The GRATH DRY CLAY BRICK PRESS.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

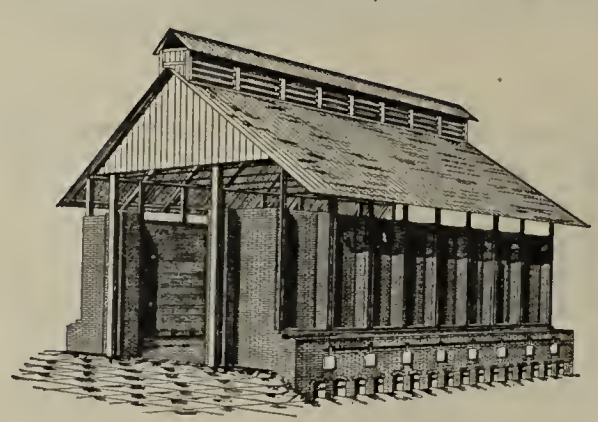
Features:

1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Requires less power to Operate.
5th. Brick free from Granulation.
6th. All Bearings Bushed.
7th. All parts Accessible.
8th. Thickness of Brick Changed without Stopping.
9th Master Wheels Close to Bearings.
10th. No Working parts under Lower Cross Head.



The GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH GRATH GAS AND COKING FURNACES ATTACHED Built Round, Square and Continuous. Perfect results guaranteed. No soft, overburned or flashed brick, uniform throughout.

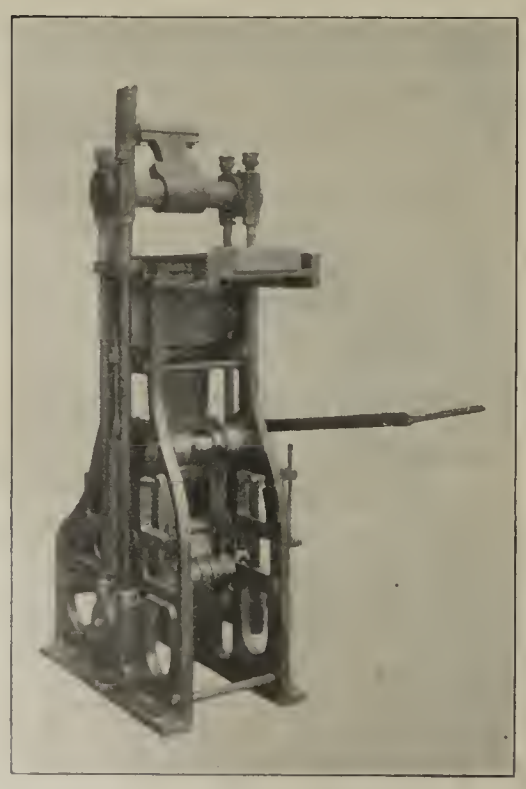


The Grath Up-Draft Kiln.

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with slack coal, with better results than lump coal in ordinary Furnaces and without any black Smoke.

The Grath Gas and Coking Furnaces

Can be attached to ALL kinds of Kilns, either old or new, and produce better results with SLACK than lump coal in ordinary furnaces. PROTECTION GUARANTEED TO ALL USERS. WILL PROSECUTE ALL INFRINGEMENTS.



The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK. The only successful Press of its kind in the market.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

The Coffeyville Vitrified Brick and Tile Co.

MANUFACTURERS OF

Repressed Vitrified Paving, Building and Face Brick and Drain Tile

Plants at Coffeyville, Cherryville and Independence, Kan. Daily Capacity 325,000

W. P. GRATH, Pres., Coffeyville, Kansas, April 30, 1900.

The ILLINOIS SUPPLY & CON. Co., ST. LOUIS, MO.

DEAR SIR—Replying to your favor of the 24th inst., we are very much pleased to state that the Hand Power Press which we purchased from you is giving perfect satisfaction, and is making a very fine grade of ornamental brick, with less than half of the expense and more than double the capacity of the screw press.

Wishing you success in the sale of this machine, we are

Yours very truly, THE COFFEYVILLE VITRIFIED
Per W. H. MAHAN, Gen'l Mngr. BRICK & TILE CO.

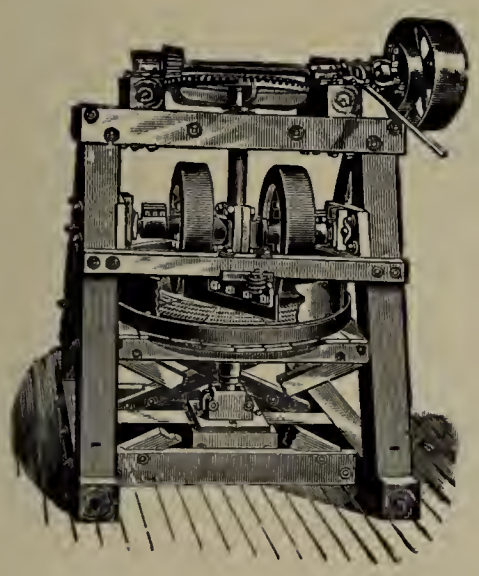
For Further Information and Catalogue on Above, address

The Illinois Supply & Construction Co., ST. LOUIS, MO., U. S. A.

Mention The CLAY-WORKER.

OUR SPECIALTY IS

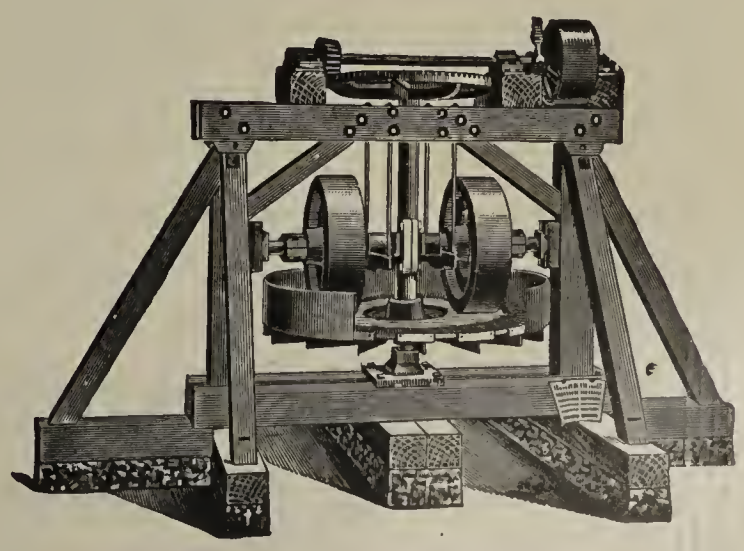
DRY PANS.



IRON FRAMES,

WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill., U. S. A.

Write for Catalog.

The Standard Brick Drier.

There will be more money in your business if you use a good artificial Drier than if you depend upon old Sol, and there will be still more in it if you use **The Standard.**

The Standard Drier is reliable. It is not an experiment. It has a record of success not approached by any other. It dries all kinds of clay products **uniformily, rapidly and at least cost.** If that is the kind of a Drier you are looking for, write us.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

Send for Testimonials.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., SEPTEMBER, 1900. No. 3.

Written for THE CLAY-WORKER.

AT THE PARIS EXPOSITION.

Yankee Clayworking Machinery Excels That Exhibited by Other Nations and Is Awarded a Medal of Honor.

THERE IS A WORLD of interesting things to be seen here at the Paris Exposition. One may spend days in wandering through the avenues and grounds admiring the beautiful buildings and the artistic surroundings, and feel well paid for the trip, without even venturing within the great buildings filled with the world's art treasures and mechanical triumphs. While in magnitude of exhibits the show may not be equal to that of the Chicago World's Fair, there is enough here to keep one busy for weeks if an attempt is made to view the entire show. I presume I must not even attempt to generalize, but proceed at once to tell the readers of The Clay-Worker what I have found in the way of exhibits of special interest to them.

In the machinery department there are a number of displays of brick, tile and pottery machinery, six nations being represented, namely: Russia, England, Italy, France, Germany, and, last, but by no means least, the United States. The latter, I am proud to say, makes really the finest exhibit and have been awarded a medal of honor. Next to the American exhibit that of the Russian manufacturers is the most interesting and proves that they are progressive. The machines of recent manufacture showing considerable improvement over those of more ancient vintage. The latter are quite crude, and I take it are the ones in common use in that country. If such is the case, Russia ought to be a good field for American manufacturers.

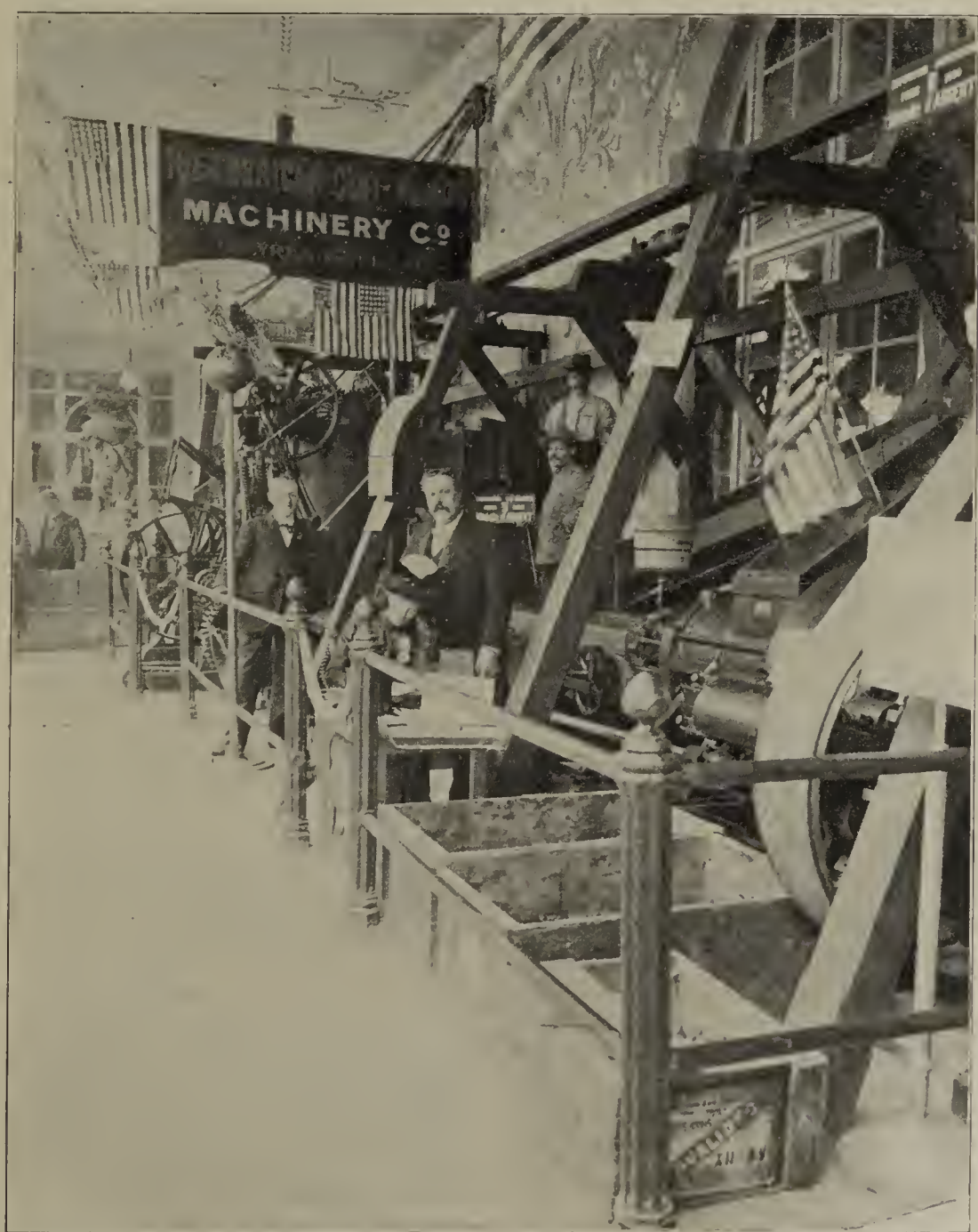


EXHIBIT OF THE AMERICAN CLAY-WORKING MACHINERY CO., AT THE PARIS EXPOSITION.

The clayworking industries in European Russia dates far back, pottery in particularly ranking among the oldest and most widespread of the home industries of the empire. In olden times, the work was carried on in the majority of cases by families, each operating on a small scale. Of later years the Government has taken an interest in the work and as a result, a number of large establishments have been started, operating on a much more extensive scale and of course adopting improved methods and appliances.

In an interview with those in charge of the Russian exhibit at the exposition, it was said that one of the largest of the present brick plants of Russia, is that of K. Z. Vachter, whose first works were built at Zhdani, in the Borovichi district, near the large clay deposits which are known by people interested in the clay industry, to abound in that territory.

The business increased so rapidly that he was compelled to erect a new factory after the import duty went into effect a few years ago. The second plant has been established near Borovichi. During the past ten years the growth of the output has increased to such an extent that the output amounts to about 10,000,000 pieces, or a growth of 7,500,000. This is merely a beginning, a private venture by a few persons, which will, it is thought, result in the further manufacture of firebrick in Russia.

It was further said: "The manufacture of drain pipe and stoneware was recently instituted at the Vachter plant and the equipment of the plant for this work has now three rolling and three cylinder presses for working the clay mass. Wood is used as fuel, dried in a special kiln. The wood is dried very thoroughly. There are four such furnaces at the manufactory, with a general surface of fire grates of sixteen meters. The plant, with this equipment, is able to produce from 400 to 500 pipes daily, one (Russian) arshine long, and six to nine inches in diameter. The average production, therefore, amounts to 120,000 pipes a year. Hard presses are used for pipes of small diameter, beginning at two inches.

"In regard to firebricks, the demands of the Russian manufacturing industry are supplied, to a considerable extent, by home production. This is especially the case in regard to the metallurgical works.

"As an article of trade, the production of firebricks, for the use of factories, architectural purposes and the building of Russian stoves, is, as yet, but feebly developed, the yearly output not amounting to more than 25,000,000 pieces. The material is of local clay."

When asked how the Russian industry compared with other European concerns, the reply was:

"The production is small in comparison, of course. The Hoganas factory in Sweeden, or the Glenboigs in Great Britain, for instance, or the Baumaterialien Gesellschaft in Austria, whose several outputs run from 50,000,000 to 80,000,000 yearly."

As may be known the home industry in Russia has been seriously handicapped, until very recently, by the widespread preference in Russia for the English firebrick. Long ago the excellence attained by the English brick was recognized in Russia, and for years there was no duty on English bricks, and it was cheaper to ship the ware from New Castle to St. Petersburg than from the home plants to the capital.

The foregoing will prove the brick industry in Russia and Siberia to be on the high road to success. In addition to the existing favorable conditions, must be taken into consideration the future certain industrial and commercial growth of the huge empire in Russia and Asia, and an idea will be formed of the possibilities of expansion in the young, but powerful, nation.

If the conditions of trade and manufacture are favorable to English and German machinery makers there is nothing to prevent American manufacturers from entering the field and reaping some of the benefits which may be obtained by earnest competition in the market which is said to be unquestionably opening for up-to-date labor-saving mechanical appliances.

—The American Exhibit.—

Returning to the American exhibit—there is but one, and that is made by the American Clay Working Machinery Company of Bucyrus, O.—we find here a number of well-known machines and a face and personality familiar to many of the brick and tile manufacturers of the United States, for the gentleman in charge of the display is Mr. Alexander Batley. It is needless for me to say that nothing pleases this gentleman more than to welcome visitors from the States, to whom he recites, with pardonable pride, the trials and tribulations which have befallen the American Clayworking Machine Company in connection with their Paris exhibit. As the readers of The Clay-Worker well know their first consignment of goods went to the bottom of the ocean in the steamer Pauilac, last February. The shipment was valued at $25,000, and was an entire loss. Undaunted by this catastrophe the company at once ordered their men in charge of the various departments of their factory to set to work and duplicate the entire equipment. This they did so effectively that the second consignment was shipped in time for its installation in machinery hall. Mr. Batley had preceded the first shipment, and so had to wait several weeks for the arrival of the second. This afforded him an opportunity to visit his old home in "merry hold Hengland," which he was not slow to grasp, and while doing so boomed the interests of his firm in the Queen's home territory.

The machinery as exhibited by the American Clay Working Machinery Company is heavier, more substantial and in every way better built than the same line of machinery shown by other countries. The machinery of other exhibits is more like models of the magnificent exhibit of the American clay works, or toy machines in comparison. There seems to be a lack of modern improvements in the machinery of the other countries. Those in a position to know say they saw the same machines years ago.

The Bucyrus exhibit has just put in a new motor and is doing exceptional work at their place on the Esplanade des Invalides, and with the knowledge of a silver medal award they are making a grade of brick daily "to the queen's taste," so to speak. The Queen has not, as yet, visited the exhibit, but it is confidently expected that after she sees the printed list of awards she will run over at once.

The machines on exhibition by the American Clay Working Machinery Company are the Eagle double-die brick repress, weighing 7,500 pounds, and in which is combined the very latest devices for facilitating a greater output with less labor and power. The machine is designed for repressing paving brick and face brick in either plain or ornamental shapes. Its motion is particularly easy, and without the jar or jolt which is usually so destructive to machinery. The machine is appropriately surmounted by a large gilded eagle.

Another of their machines on exhibition is their new automatic oscillating cutting table, which is regarded as a decided forward step in the line of this class of machinery, and which is said to be a flawless machine, on which perfect reliance may be placed. There is not a flaw either in material or workmanship.

The upright stock brick machine and pug mill is also in operation and attracting attention. It has a capacity of from 2,000 to 3,000 bricks per hour.

Owing to the fact, probably, that the hollow bricks, for building purposes, are becoming popular, there is an extensive display of this particular line of ware, both in the American exhibit and that from other countries.

Those who are connected with the exhibit of the American Clay Working Machinery Company, of Bucyrus, O., U. S. A., in addition to Mr. Alexander R. Batley, who was formerly a resident of Manchester, England, are, Mr. Chas. Bohnen, of Holland, the interpreter, who speaks five different languages, and who may return to America as a representative of the plant. The young lady, who is also from Bucyrus, and while in Europe, although in connection with other work, assumed charge of the private correspondence for the company; William S. Rabuck, of Wisconsin, U. S. A., the machinist, and Charles Sherman, of New York, general attendant.

Willing to Compromise.

These is a very good old story of a Jew who got to bargaining in a dream one night, presumably after a day of the same tactics in reality. The imaginary deal had progressed to a point where the price was to be settled. The son of Israel was seller and had received an offer of five hundred dollars, but stoutly held out for "fifty-five." So great a clatter was made in the haggling that the Jew woke up before the price had been agreed upon. Realizing that there was no time to be lost, he instantly closed his eyes and shouted, "All right; make it five hundred; I'll take five hundred."—Exchange.

WRITTEN FOR THE CLAY-WORKER.

GOLD BRICKS AND CLAY TESTING.

PERHAPS THE BIBLICAL INJUNCTION that man is made from clay is responible for the audacity and familiarity with which most men tackle clay problems, as being one of the few chunks of knowledge that is "born in them." Possibly it is the omnipresent and never-ending fight with the sticky variety of clay that usually characterizes our American roads that has given him so much confidence in himself from successfully (?) battling against being stuck in the mud, that he quails not at other "problems in clay." For if there is a characteristic in the American type of homo-sapieus that seldom disappoints, it is the fact that the average man no sooner sees a clay that happens to differ from the mud of his daily battles, than he at once assumes it is valuable, and immediately begins to talk of starting a factory to make — to make—to make whatever the clay is said to be good for. This last information is frequently obtained from a local brickmaker, because local brickmakers are almost omnipresent (of some kind or character). Perhaps there may be other kinds of clay plants within reach, and possibly they are all consulted as to the value of the new find from a little hand sample. Some practical man is, perhaps, finally found who, after whittling one piece with his knife, and temporarily making a tobacco quid of another piece, confidently indorses the clay, or damns it with a sagacious shake of his head. Should the clay be pronounced good, the practical tester usually forgets to distinguish whether it will be good for the owner's bank account, or for the "other fellow's" bank account, or for the bargain hunter type of contractors that are always willing to take the output of new clay plants at the gift prices demanded for "introducing the goods."

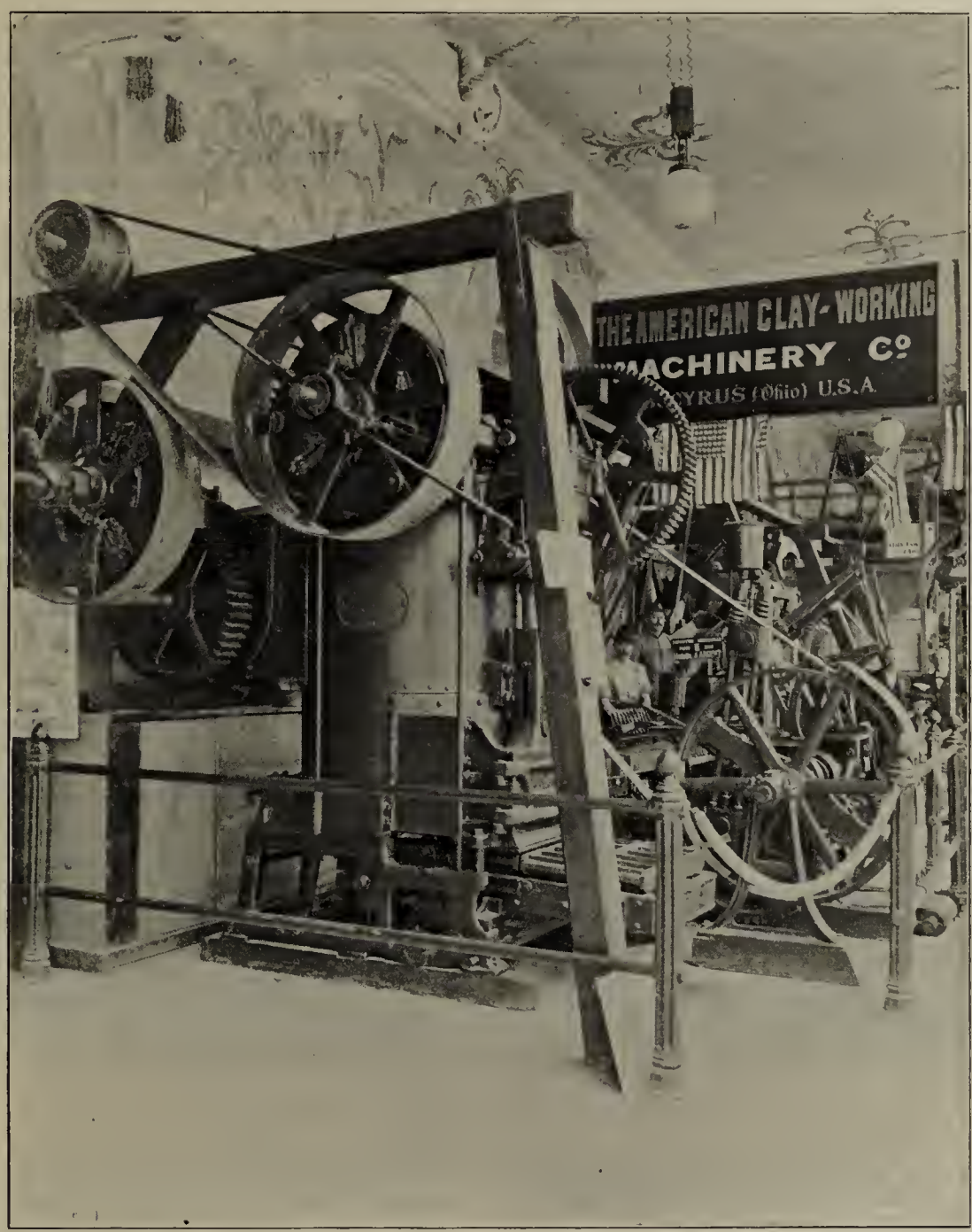


Exhibit of The American Clay-Working Machinery Co., Paris Exposition. See page 179.

Had the new seeker of a fortune from clay discovered a new deposit of iron ore, or a building stone, or cement rock, he would have recognized that its value has to be passed upon by specially trained experts, and if reported satisfactory, he would have tried to sell out to people who understand the business, and who therefore stand a fair chance of making a success of it. But on a clay proposition he perhaps visits a neighboring plant or two, watches the brick or other product made until he comprehends how it is done, and then thinks he knows all about it, which he proceeds to demonstrate by erecting a factory. The machine man is benefited by a new transient customer, some laborers are temporarily given new employment, and unless the bank account is exceptionally substantial, or the man proves to have more brains and better judgment than his first actions indicate, the plant is apt to soon become another of the very numerous monuments that are scattered throughout the entire country, and which demonstrate that at least all men do not understand how to make brick, or pavers, or tile, or fire brick, etc., etc., etc. If the machinery men were willing to give lists of the embryonic plants that at least made a start, it would be easy to understand why there are so many manufacturers of clay machinery, and what becomes of all their new machines. But before the laws of trade begin to bring up the factors of successful competition, or favorable conditions for raw material, properly designed plant, economy in manufacture, market requirements, transportation, selling ability, credit, etc., etc., the decision as to the value of the clay may be at the bottom of the failure. As the whole enterprise primarily depends on the clay being suitable for the purpose, this decision is of the gravest importance, and unless this fact is clearly established, it is needless to call in an expert to design the plant, or for an experienced manager to operate it.

The present practice of clay testing for commercial purposes has not advanced very far beyond that stage when the business world had no express companies, but depended on friends, relatives and strangers to ship their hand packages. It is well within the memory of the living generation when Mr. Adams conceived the idea of *making a business* of looking after the packages that were daily sent from New York to Boston, when strangers would beg the departing traveler to "kindly give their package to a woman with a red shawl at the Boston wharf." No fees or charges were made, as every one expected to have to beg the same favor some other day from some other stranger. Consequently, Adams Express Company was doomed to be a failure, according to some pseudo economists, "as he actually charged money for taking only a little package to Boston." But Adams Express Company has become the

successful enterprise that it is because it charged money, and made a business of giving reliable service. But clay testing is still in its infancy in this country, as most people are startled when the professional clay-tester "actually charges money" for his tests, whereas some "practical man" will be only too glad to have his vanity flattered by being asked for his opinion on a clay, which beyond whittling, chewing, and possibly sticking a piece in his kiln, is as far he usually carries his tests. But as he is a so-called "practical man," that is, probably began wheeling brick when he should have been in school, and by hard work and faithfulness has risen to foremanship of the yard, perhaps has worked in one or two other yards, possibly has heard of other processes and different kilns, but never operated them, nor can he understand the drawings of them, and still less, has he read the excellent works in German on the subject. Yet his opinion is regarded as satisfactory on a decision that will involve many thousands of dollars to first build the plant, and probably very many more thousands before the owner is satisfied that the clay is unsuitable. This is called shrewdness and good judgment in not paying a $25 to $100 fee to a "scientific cuss," whose damnable qualifications are that he has fundamental broad, scientific education on which to build the experience of a trained observer, who travels all over to see all kinds of clay under all kinds of conditions made into all kinds of ware, and backs it with a heavy supplemental reading and study of the experience and work of others. Of course, it takes long preparation, a large financial outlay, and extensive travel to make a well qualified "scientific cuss," who asks a fee commensurate with the value of his opinion, which in no case compares with what his professional brethren in other lines are paid. Prof. Newberry was gladly paid $5,000, and the expenses of a continental trip for his opinion on a faulted vein that it took three hours to investigate. Capt. Eads was paid $10,000, and the expenses of a European tour to give an hour's talk at Manchester on the ship canal. It is true that grave problems were to be solved, and the best and most experienced men were the cheapest at any price. But the expenditure of $25,000 to $200,000 is a very serious matter if it is wasted when a $100 to $500 fee would have prevented it. Yet it is the rankest kind of a lottery to build a clay plant without having the clay properly tested. The emphasis is necessary on properly testing a clay, as the chemical analysis that a few tyros think is sufficient to judge a clay is merely the beginning of the tests that are necessary to judge a clay.

A chemist may give a most accurate analysis of a clay, and add his inexperienced judgment of the clay, but his verdict in most cases will not be as valuable as that of the clay-whittler. For the chemical composition is only one of many factors that affect a clay, and the average chemist is only acquainted with this one factor. His information is very desirable, and in proper hands will expedite the work in obtaining the much more important facts that are necessary in judging a clay. But to stop at an analysis, and especially the analysis and opinion of most commercial chemists, who usually know nothing about the working of clays, is extremely dangerous, and liable to subsequently prove very costly in trying to work the clay, though the expense of the analysis probably does not exceed $25.

A properly made series of physical tests on an average or reliable sample that amounts to at least 30 pounds will enable enough information to be obtained about a clay to safely determine its value. Even with complete physical tests it will be found wise to reduce the expense and time in getting the plant into successful operation to make a large working test of several tons with the machinery that it is proposed to use in making the ware. For experimenting with factories and heavy machinery is very costly, both in time and money, yet this very extravagant method is very frequently adopted, rather than pay an expert a few hundred dollars. It is quite true that the investor learns a great deal himself by this cut and try method in the factory, and if his bank account holds out long enough until he has educated himself by such costly schooling, he is likely to finally succeed. But few people can afford to accumulate a museum of brick machinery in finding out the proper machine for his clay, as occurred on a famous Iowa yard, and still fewer can afford to squander over $200,000 and more than three years' time in experimenting with a big factory, and calmly say to the writer: "As it was my money, no one has a right to complain," although no marketable goods had yet been made. Such Napoleonic experimenting can be indulged in by the few who enjoy such colossal incomes as to be able to pay such prices for their

Works of the Pine Bluff (Ark.) Brick Co.

education, but the average clayworker, who proposes to make a fortune rather than squander a fortune by making clay products, had better buy this knowledge of a competent, experienced expert if he desires to save thousands of dollars at the cost of a modest fee.

These primary physical tests that should be made on all new or untried clays, to learn their use and value, include the plasticity, shrinkages, speeds of drying and burning, and burning test for fusibilities, color and strength. If properly and thoroughly made, they give an excellent and reliable idea as to the properties of a clay and its commercial value; but to properly make the tests requires time and experience that is worth at least $25, and will often amount to at least $100, for the test. Yet small and insignificant as is this $100 fee compared to the value of the results and the subsequent big saving over the factory method of testing, there are still many —aye, as yet a big majority of investors who follow the "penny wise and pound foolish" method of building the factory first, and then afterward learn if the clay is suitable.

Some machinery people are blamed for inducing more than one doubtful investor to go ahead and erect the plant for the extremely strong claims and guarantees made by the enthusiastic commission-paid machine salesman, who perhaps backs it up by a very pretty little sample of ware that they have made themselves with "the very machinery we are going to sell you." But if the energetic machine salesman is willing to "flirt with facts" and make statements and promises as to results that are utterly unwarranted, it is no excuse for the purchaser to go ahead and accept such prejudiced data without thorough investigation, and if subsequent results in the factory fail to meet the promises of the machine salesman, the purchaser deserves to be "burnt" for such poor judgment and lack of business sense. In fact, there are some manufacturers of clay machinery who are in "business to stay" that decline to sell their goods until they have satisfactorily tried their machines on the new clay, as they are not going to jeopardize the reputation of their machines by having them involved in a failure that is due to the blunder of an inexperienced clayworker.

There are a few investors who are willing to spend $5 or $10 for a test, and who begrudgingly pay some so-called expert $5 for a test that is worth $50 or $100 if properly made. Yet these same men would wither one with contempt if advised, in buying their clothes, to pay only $5 for a suit, because $5 will buy a suit on Chatham street. They know that good clothes cost much more money, and that they are more economical than the cheap trash. But when it comes to buying the report of an expert, they seem to lose all power of discrimination, and fancy that a $5 report is as good as a $50 or $100 report.

The mining business has only recently outgrown a similar embryonic condition, as it is not long since that any one living in the Western mining districts, whether a janitor, or carpenter, or expressman, was regarded as competent to report on mines, from the mere breathing of a mining atmosphere, and the carefully trained and experienced experts, who asked fees of $100 to $1,000 for a report, had very little business. But after the Eastern investors were loaded with trunks full of worthless stocks, or else, when they did secure a valuable property, find that they also had an ugly tangle of cross-claims and other law suits on their hands, they found the professional expert to be a very economical man, even if the pseudo-carpenter-experts only charged $5 or $10 for a report. After being "severely burned," he realized that it was cheaper to pay $1,000 to a reliable expert than $50,000 for a salted hole in the ground, and that an investment of $500 for a competent investigation was less costly than $25,000 spent in litigation in trying to hold a good mine.

Most clayworkers clearly recognize that well-built machinery costs more than cheap, flimsy machinery, as it is much more economical in its freedom from repairs and costly breakdowns; that a carefully laid-out, well-built plant is more expensive to build, but is much cheaper to operate and is a bigger money maker than a cheaply built plant, and they heartily laugh at the farmer who tries to suddenly get rich by buying a $10,000 gold brick for $500. Yet when they go into the market to buy the brains of a clay expert, they play the gold brick game on themselves, and feel hurt when it is intimated that gold cannot be bought at the price of brass.

CLAY TESTER.

The Pine Bluff Brick Co's New Grath Up-Draft Kiln.

AN ARKANSAS BRICK PLANT.

Some of your readers may not know that Pine Bluff, Ark., is on the map. For their benefit, will say that it is the county seat of Jefferson county, the second most populous county in the State. We are in round figures 400 miles south of St. Louis and 100 miles southwest of Memphis, on the Cotton Belt Railroad, which carrier an ad. in The Clay-Worker. Pine Bluff is a progressive city of nearly 20,000 inhabitants, and affords us (the Pine Bluff Brick Co.) a fine market, and, besides, we ship a good many brick to points on the two trunk lines which pass through our city. We occasionally ship brick as far south as Texas and Louisiana, and north to points in southern Missouri.

We have forty-two acres of clay, which averages from six to eight feet in depth. It is plastic and makes a good red build-

ing brick, which we turn out at the rate of 35,000 a day—nine hours. The brick are made on a Hercules soft mud brick machine from the factory of the Horton Mfg. Co., Painesville, Ohio, in our opinion the best soft mud brick machine made. The brick are handled by the Adams truck pallet system and dried in a ten-tunnel Standard dry kiln, with which we are also well pleased.

We have been burning our brick with wood in old style groundhog kilns, but have recently added one of Grath's updraft kilns, with gas and coking furnace attachment, in which we use slack coal and burn in from eleven to thirteen days from start to finish. We were more than pleased with our first burn in the Grath kiln, found that we made a good saving in cost of fuel and burned the brick a uniform color throughout the kiln, so we intend building several more of them.

Our brick are peculiar in that they do not shrink in burning. When first made they are 9x4⅜x2¼, and are practically the same after being dried and burned. There is so little shrinkage that there is no perceptible settle in the kiln.

Business is pretty good and prices are satisfactory, averaging $6.00 to $8.00 per thousand. If present conditions continue, we expect to be able to attend the next N. B, M. A. convention. With best wishes, we are yours truly,

Pine Bluff, Ark. PINE BLUFF BRICK CO., Per B.

Furnaces of the Grath Up-Draft Kiln.

TO PROMOTE LONGEVITY.

An authority on the subject says that the average business man would live longer and feel better if he would observe the following rules:

Eight hours' sleep.
Sleep on your right side.
Daily exercise in the open air.
Keep the sleeping room well ventilated.
Take a sponge bath, then a "rub-down," and at least twenty minutes' exercise before breakfast.
Eat little meat and be sure that it is properly cooked and eaten with various other wholesome foods.
Eat plenty of fat to feed the cells which destroy disease germs and avoid intoxicating liquors, which destroy these cells.
Don't confine yourself to one occupation too long at one time during the day; take frequent holidays; limit your ambition; and
Always keep your temper.—Ad. Sense.

Written for The Clay-Worker:

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 11.

BY ALFRED CROSSLEY.

Methods of Manufacture. (Continued.)

THE DESCRIPTION of the manufacturing process would, of course, be incomplete without some reference to drying and burning. The drying of fire brick is usually done on hot floors. In England the mode of heating most commonly adopted is by exhaust steam. This is a very effective as well as economical method, and when a floor is put down properly, so as to heat in sections, it is under perfect control, and a greater or less heat in any section can be had at will. These floors are variously covered, viz., with cast iron plates, glazed tiles or bricks, unglazed brick in two courses, with or without a layer of pitch between, and some covered with concrete. Of these coverings, cast iron plates are still most in vogue. Steam floors are also put down with glazed hollow block, no covering in this case being required, and when done properly these make a most excellent floor. Other methods are the old furnace-heated floor, and to a limited extent floors heated with the waste-heated gases from kilns. In America the exhaust steam floor is used to some extent, but for some years after its introduction made but little progress. Some of the earliest floors of this class put down here were done by inexperienced persons, were improperly constructed and a prejudice was created against them. Most of the hot floors in use here are heated by direct furnaces and most of the fire brick are dried in this way, although in a few large establishments the tunnel system of drying has been adopted.

In the drying of fire brick in many works which I have seen it was quite common to put them down from the molder onto a really hot floor, where in a few hours they were picked up and pressed and put down again to finish drying. In this way the brick are often very stiff on the outside, especially corners and edges, while the inside is still soft. This is not the right way to get good brick. A much better plan is to put them on a mildly warm floor, just warm enough to stiffen them through so that they will be in proper condition to press the following morning. By this means much sounder and better finished brick will be the result. The principle governing this should be, not to put them on a hot floor, where they will dry irregularly, as mentioned, but on a warm floor, where they will stiffen uniformly throughout. After being pressed they can then be transferred to a hot floor and dried off.

In fire brick making by the old soft mud process, especially on a large scale, where many thousands are made in a day, it is, of course, necessary to have some expeditious method of drying, and the rule is to have the brick dry and in the kiln within, at most, forty-eight hours from the time of making. Although any suggestion for a longer time to be occupied than this is scarcely practical and would almost certainly fail of more than a moment's consideration by any manufacturer, yet I would like to call attention to a fact that is probably not sufficiently considered, viz., that the refractory quality of all clay wares is sensibly improved by slow drying and long seasoning in the dry house. This fact is well recognized by the glass pot makers. It is well known that glass melting pots require to be extremely refractory, having to stand an intense heat and also to withstand the fluxing action of the molten glass mixture. One of these pots is never used as soon as it is

dry, even though from their large size and great thickness they are necessarily dried slowly. After they are quite dry they are kept for months in a warm atmosphere in the drying rooms, and by this seasoning process their refractoriness is said to be largely increased. In fact, so particular are the makers about this, that it is customary when each pot is finished, to stamp the date upon it, and it is not allowed to go to the furnace until it has attained the necessary age. I am not prepared to give a scientific reason for this, but am simply stating the fact. If this be true of these wares, are we not brought by inference to the conclusion, from which we cannot get away, that the refractory quality of fire brick also would be improved by a like seasoning or tempering process? In the case of ordinary qualities such a treatment would be entirely out of the question, because of the cost, and the necessity does not require it, but in the case of the highest clases of brick and other fire clay goods, if such a process should add perceptibly to their "life." the enhanced value would easily repay the extra cost.

The last stage of manufacture is the burning, and the paramount importance of this department is so well recognized among brickmakers generally by this time that it need not be especially emphasized here. It is not necessary to describe in detail the methods of burning or the various systems of kilns used in the fire-brick business. The square, open-top, up-draft; the down-draft, both round and square; the Newcastle, both single and double; the potter's oven; and the continuous, in a variety of forms—all these types have been used in burning fire brick. The most common in the north of England (Durham and Northumberland) has been the single Newcastle, holding about 8,000 to 10,000 each, but it is far from being the most economical, and also does not burn the brick uniformly. In some parts of America the open top, up-draft kiln, built to hold from 20,000 to 30,000, has been much used, but the kiln most largely used here is the down-draft, both round and square. I have had some experience with these three classes of kilns, and, taken altogether, have found the down-draft the most satisfactory, and for the majority of works I consider the most suitable. With this kiln, properly drafted and constructed, it is no trouble to get a thoroughly even burn all through. Fire bricks require to be thoroughly and evenly burned, and if they are good for anything they require a strong heat to do this, in order to bring them to the point where the shrinkage or contraction shall have ceased. No uniform time can be given for burning, but under proper conditions fire brick can usually be burned in from sixty to seventy-two hours, that is, of course, after the water smoke is all off, and the kiln is put on full fire.

For those who are looking for the most scientific type of kiln, and who are in a position to avail themselves of such, probably the most advanced is the Dunnachie Regenerative gas fired kiln, of which there are two arrangements, described as the "continuous" and the "composite." This kiln has been the subject of a lengthy article in two recent numbers of a foreign contemporary, in which it is made to appear that this kiln has been an unqualified success at the three works in this country where it was adopted. As a matter of fact, this is totally untrue, for in one case it was an absolute failure and was abandoned; in the second, it was anything but a success, and for a long time was a kind of a "white elephant," and in the third case I do not now remember what the report was. And yet, to my mind, all this proves nothing to condemn the kiln. I feel bound to look at the other side, viz., that in the largest fire brick works in Great Britain, this kiln has been in regular, and, I believe, exclusive, use for quite a number of years, and is an unqualified success, and, as further attesting its merit, the character of the brick produced is such as to require the most intense heat to properly burn them. A saving of 75 per cent. in fuel has been achieved, the brick are burned thoroughly uniform, the time of burning reduced to thirty-six hours or less, the kiln is said to be fired even more easily than the simplest form of down-draft kilns, and the repairs have been so small that some of the kilns have been run continuously for three years at a stretch without repairs of any kind being required. Despite the failures, therefore, the exceptional merits of this kiln render it worthy of investigation by those who have a very large output and can afford to adopt it. For small or medium sized works, however, I must reiterate my preference for the round down-draft kiln.

The manufacture of brick from the tertiary clays has already been mentioned. These are made both in England and America, and although not as good as those made from the clays of the coal measures, are a fair quality of brick for many purposes. They cannot, however, be used with good results in blast furnaces. The material is a partially decomposed feldspar, or granite, with more or less inferior kaolin mixed with it. In some cases this is used as occurring naturally and in others certain ascertained proportions of quartz and mica and china clay are mixed together. The principal location of their manufacture in England is in Devonshire and Cornwall. They are chiefly known as Lee Moor and Caldstock, respectively. The Lee Moor brick are said to have been used at the Woolwich Arsenal in the heating furnaces, with good results. A somewhat similar brick, though not of so good a quality, is made here in the South, where at several places in Tennessee and Alabama, an inferior kaolin, containing a varying quantity of quartz, is made into fire brick. They require an intense heat in the kiln to burn them properly. They appear to stand the fire well, up to a certain point, beyond which they cannot be relied on. One objection to this class of brick is that they are mechanically weak and will not bear rough handling. This objection can be largely overcome by using a proportion of good, but highly plastic, clay, to act as a bond.

It is said that in Derbyshire, England, a highly refractory brick is made from a fire clay consisting of the insoluble remnants from the local dissolution of limestone, intermixed with the debris of the overlying millstone grit. The clays are sufficiently adhesive to be molded, and their contractibility is small, both in drying and burning. This formation, it is said, will furnish an inexhaustible supply of the most refractory clay. I should very much doubt, however, that this class of clay, whatever it is, would prove reliable as to quality.

I promised earlier to make some reference to other refractory brick than those made from fire clay, which, though a little out of the ordinary line, are yet germane to the subject and interesting to know something about, and with some description of these, this series of articles will be brought to a close.

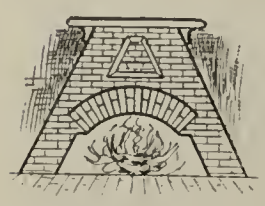
BUSINESS AND THE POSTOFFICE.

There is no more accurate or reliable test of the prosperity of a civilized nation than its postal returns. It is a consensus of testimony that is practically unimpeachable. It is outside and beyond all insidious efforts at manipulation. When the mails are fat business is good, and that, if an old saying, is none the less true now as ever it was. It is this fact that gives special interest to the annual reports of the postoffice department. It is the thermometer of trade, no matter whether on the sunny or shady side of the street.

The fiscal year ending June 30, 1900, is the greatest in the postal history of the United States, and this is in close and unerring touch with the business record of the same year. In 1884, a year of business depression, the shrinkage in postoffice returns was marked. The subsequent reaction made an increase of 25 per cent. between 1885 and 1888. The panic that followed, with its widespread and disastrous consequences, saw another sharp decline in postal business. As conditions improved and inertia was displaced by activity, the postal business of the country rose by the same hydraulics. The returns for the fiscal year closed on June 30, 1900, surpasses all previous records. The total issues of 1899 were 4,195,885,523, of the face value of $79,168,272. In 1900, the issues were 5,283,687,010, of the value of $97,640,897. It is estimated that if the receipts for periodical postage were added, the figures for 1900 would be about $101,000,000. These figures are not without a plentitude of encouragement to business men generally. They are evidence of conditions that, while susceptible of exaggeration, are too self-evident to be ignored. They may not guarantee a permanence of prosperous conditions, but if history is not reversing its traditional record, it will take a long time to change the course of the tide, that must run its course before it recedes.—Age of Steel.

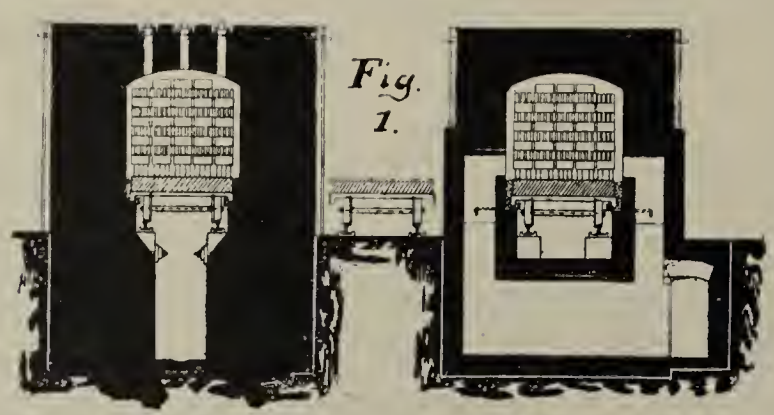
Written for The Clay-Worker.

THE LATEST MODIFICATION OF THE TUNNEL-KILN AS CONSTRUCTED BY MOELLER & PFEIFER.



T THE LAST MEETING of the German Clayworkers' Association, one of the most interesting papers was that by Dr. Moeller on the combination of tunnel dryers with tunnel kilns, of which the following is an abstract. Mr. Moeller stated at the beginning of his address that he realized the difficulty of the task of bringing before the public a better kiln than the continuous kiln used so extensively at present. This task seems the more venturesome when it is proposed to revive the tunnel kiln which met with such a disastrous failure thirty years ago. But theoretical as well as practical reasons can be stated in favor of the tunnel kiln, the theoretical points being entirely supported by very recent practical experiences on a large scale.

The kiln has the shape of a straight tunnel, in which the



Cross Section of Tunnel Kiln.

brick are burned while being moved through the kiln on cars. While in the continuous kiln the fire moves, in the tunnel kiln it is fixed and the ware advances. In the tunnel kiln the water smoking, burning and cooling zones are always at the same place, every portion has always the same temperature.

On entering the brick pass into continually increasing temperatures, they pass the water smoking zone, remain a certain length of time in the hottest portion, and finally arrive at the end of the kiln through the cooling part of the tunnel. The tunnel-like kiln space is bounded on top by an arch, at the side by the kiln walls, while at the bottom it is closed by a peculiar arrangement. The cars which run through the kiln on rails consist of axles and wheels and of an iron platform; upon the latter there is placed a heavy fire clay tile.

Since the entire tunnel is filled with loaded cars at all times, the fire clay tiles which touch each other form a continuous plane which separates the space above, the kiln space proper, from the space below, in which are the iron parts of the cars.

It will be readily seen that this partition must be very tight, since the cars are to pass the zone of greatest heat. In order to accomplish this iron troughs are arranged along both sides of the kiln, just below the platform of the cars. These troughs are filled with sand. On the other hand, the cars are provided at both sides with flanges which dip into the trough filled with sand so that a perfectly tight partition is obtained and kept up, even while moving the cars. This has been demonstrated by the builders in a practical way, who walked through the space below the cars while the kiln was in operation.

The firing may be accomplished as in the ordinary continuous kiln by charging the coal from the top or gas firing may be used without the least trouble.

Whenever a new car is run into the tunnel with dry brick the tunnel is opened only for a moment; at any other time it remains closed tightly. Not far from the entrance end there are arranged openings for the exit of fire gases, these openings being, of course, above the platform of the cars. Draft is produced by fans or a smokestack. From this it is readily seen that after passing the zone of greatest heat the fire gases flow through the water smoking and drying zones and give off all their heat. On the other hand the air used for the combustion of the fuel passes through the cooling zones and is thus preheated to a high temperature, rendering the economic efficiency very high.

The dried brick are packed on the cars at one place and the train of cars is pushed towards the fire at regular intervals to the distance of a whole or half car length by means of a hydraulic press or some other mechanism. After unloading the burned brick the cars are returned to the place of setting.

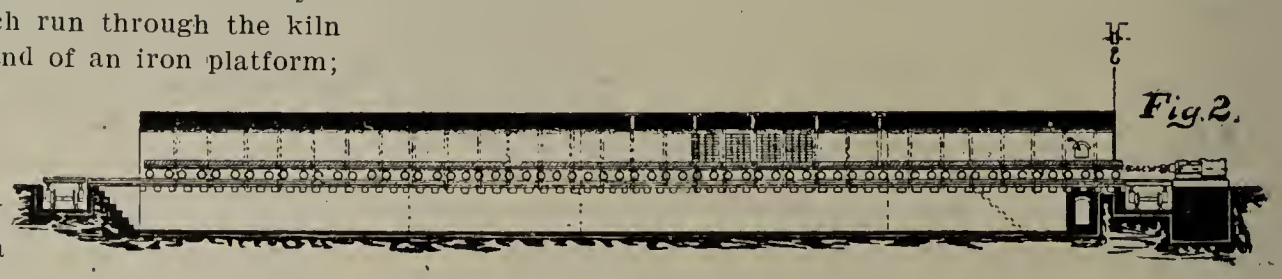
The questions now arising are: Does the tunnel kiln produce a better quality of brick than the ordinary continuous kiln? Is the capacity greater—that is, can the brick be burned more rapidly? Does it save labor? Is the consumption of fuel less than in the continuous kiln?

The burning in the tunnel kiln can be accomplished as rapidly as the nature of the clay will permit. In some of the latest tunnel kilns the average length of a burn is from forty-eight to sixty-six hours. The rapidity of operating the ordinary continuous kiln is limited by the impossibility of emptying and setting the hot chambers. With the tunnel kiln the setting and unloading is done outside the kiln.

Since the rapidity of burning is much greater in the tunnel kiln it follows that the cross section can be much smaller than in the continuous kiln. Therefore, the difference between the temperature at the top and bottom are much smaller and the result is a more uniform burn. The loss of heat due to absorption by the walls is much smaller in the case of the tunnel kiln because no cooling takes place.

In regard to the saving of labor, it is at once evident that in place of the laborious setting and emptying of hot kiln chambers, an unhealthy kind of work, the setting and unloading of the cars can be done very rapidly, since it is done away from the kiln, especially when the end of the dryer adjoins the entrance to the kiln. Furthermore, there is no casing up of kiln doors to be done, nor putting up of paper partitions.

The consumption of fuel is less in the tunnel kiln simply



Longitudinal Section of Tunnel Kiln

because the loss of heat is less than in the case of other kilns. In the first place, the burning takes place more rapidly, with the same daily capacity and the surface of kiln walls is must less; therefore the loss of radiated heat is less. Again, in other kilns it is always necessary to heat up cooled masses of wall to the maximum temperature; this is a loss of heat which does not exist in the tunnel kiln.

In former tunnel kilns the main cause of failure was the faulty construction, especially of the iron work, and derailing was one of the frequent occurrences. To-day these difficulties do not exist any more as has been proven by actual practical experience. However, there was another reason for the failure of the earlier kilns and that was the deficient supply of well-dried brick. In the days before the tunnel dryers it was not an easy thing to supply regularly the bone-dry brick a tun-

nel demands. The result was shown in discolored or injured brick.

It is absolutely necessary to have a dryer which furnishes regularly the required number of perfectly dry brick, and for this purpose there is nothing better than a tunnel dryer, operated in conjunction with the tunnel kiln. It is entirely feasible to use part of the heat from the cooling portion of the kiln for heating the air used in drying the brick, by exhausting the hot air from the kiln into the dryer by means of a fan. An arrangement of this sort certainly makes an ideal plant.

In regard to the practical experience already had with the combined tunnel dryer and kiln it can be said that such plants have been operated for over a year. One has been built for a large brick plant in France, one at a brickyard near Berlin, and one for the well-known face brick works of Holzmann & Co., near Frankfort. The latter firm have operated the plant for over a year, and report a regular output of first-class front brick of 95 per cent. Knowing the reputation of this firm in regard to quality of ware, this is a result which commands attention. AMERICUS.

THE BRICKYARD NEAREST THE NORTH POLE.

I am sending you a cut of my brickyard, which may interest you, inasmuch as it is nearer the North Pole than any other established brickyard on the continent. Another distinguishing feature is that it boasts of the longest small gang of men. Six of my men measure 36 feet 1½ inches, and none of my gang ever worked in a brickyard before. We make from 12,000 to 14,000 brick per day and the cost is $1 set in the kiln.

This is my third year in the business. Previous to this I knew nothing about the brick business. Now I oversee my own burning, setting and making. In fact, I would not have a man in the yard who professed to be a brickmaker. Until this year I have had lots of trouble, principally bad burns, from men that pretended to be brickmakers from awayback. By watching their mistakes and what I could learn from The Clay-Worker, I can burn a kiln just as easy as welding a wagon axel —in fact, it is just a welding heat I hold them at, until the fire comes to the top and we get the settle required, when I stop whether it is eight or twelve days.

Everything in my yard except the Martin machine and the steam engine has been made on the ground or in my shop. The dump cars, winding drums, pug mill, trucks, wheelbarrows and carts, etc., have been made in my shop. The racks and pallets have all been sawed from the log and made on the ground.

My yard is located on an island, surrounded by the White Mud river, almost in the center of the town and near the station. My clay bank is twelve feet deep, and it is taken directly from the bank in a dump car to the pug mill. It is a sandy clay and burns a white, cream color brick, and, best of all, my price averages $9 per thousand on the cars or delivered in town, about one-half mile, at the farthest, and a ready sale for all I have made. So, as long as this lasts I will subscribe for The Clay-Worker. Respectfully yours, MAGNESS WILSON.

Gladstone, Manitoba.

The Brickyard Nearest the North Pole.

Written for The Clay-Worker.

UTILIZATION OF WASTE MATERIAL AND FORCES.

THIS IS THE AGE of utilitarianism, and the definition of dirt to be only matter in the wrong place, is being daily verified. We now see the sweepings of our streets put to the use of the agriculturist, instead of being dumped into the rivers and sea. The garbage is beginning to be utilized in some measure, and the sewage turned into effective fertilizing material. Coal tar, which formerly was the bugbear of the gas producer, now yields hundreds of different chemicals.

We could go on at great length enumerating the progress being made by man to find uses for everything, which formerly was considered useless. However, it is only used as an introduction in this article.

What concerns us most as clayworkers is, have we any waste in our business, which could be put to use and save us money and labor. The waste in a brick factory, as far as material is concerned, is mostly attributed to mistakes, mishaps or carelessness in spoling brick. These, if either over-burned or cracked, are generally thrown away in dumps. However, when ground up and mixed with fatty clays, they serve a good purpose. In repairing kilns, often the bats of fire brick were thrown away. Now the more progressive brickmaker grinds them up, mixes them with enough plastic clay, so that they can be molded, burnt and used again.

The use of waste matter in a brick factory is of small consideration, however, in comparison to the waste of forces that we see in the brick factory of to-day. I refer to the waste of heat and the primary material, coal. We all understand that heat is derived either from wood, coal or hydro-carbon gas. All these cost money, unless you have a gas well of your own

that gives gas in abundance. Very few are favored that way, hence are not much of a factor in the consideration how to save fuel.

In a former article. I advocated the use of the exhaust steam for drying brick, with the back pressure on the engine eliminated, which is one step forward in making use of waste heat. Another step forward is the use of the waste heat from the cooling kilns. Here again is some loss in the heat used to convert water into steam for driving the engines that drive the fans.

The ideal way to utilize the waste heat from the kilns, and I do not confine myself to cooling kilns alone, but also to the heat driven off from the kilns under fire, is to convert it into steam, not only for drying brick, but to drive the whole plant. This is not an idle fancy, but will be adopted shortly by some progressive brick manufacturer. Having seen this principle used for other industries with success, I, in company with others, visited a number of them, and then brick factories, with a view how to use the heat from the kilns. After careful study, and ascertaining the heat units necessary for the use of the propelling power of the plants, we found that we had enough and to spare without impairing the draft.

Of course, it needs a special steam generator and automatic water regulator for the purpose. M. M.

OBITUARY.

J. W. Carson Succumbs to Excessive Heat and Unsuspected Kidney Trouble—An Active and Popular Member of the N. B. M. A.

DURING the hottest days of August, when the extreme heat made it difficult to live under the most favorable conditions, Mr. J. W. Carson, with characteristic energy, was busy superintending the burning of brick at the works of the Columbus Face Brick Co., at Shawnee, Ohio. Unmindful of the warning of his employer, Mr. Carson persevered in the work till he was prostrated by the heat and taken home in a semi-conscious condition. It was thought at first that he would recover in a few hours, but it was not to be, and after lingering for nearly a week, during which time he never fully regained consciousness, on the evening of August 21, his spirit passed away—quietly, peacefully, he went to sleep to wake no more as mortal man.

His employer, Mr. David C. Meehan, advises that from final developments it appeared that the deceased had been a sufferer from Bright's disease for more than a year, though no one had suspected any such affliction. His was a happy, uncomplaining nature. and he gave whatever tasks that were assigned to him his best thought and energy, making the best of his opportunities and submitting cheerfully to what had to be.

For many years he had been engaged in brickmaking, and was so successful that his services were sought by various manufacturers. Wherever he was engaged he gained the confidence of those about him, and never failed to serve his employers with fidelity and ability of a high order. He has been an active member of the National Brick Manufacturers' Association for several years, and his death will be mourned by every member of that association.

We are pleased to publish the following letters. which tell of the affection and esteem in which he was held by his associates. In common with all who knew him, we sincerely, deeply mourn his death. He leaves a widow and seven children, the eldest of whom is in her eighteenth year.

The Name Carson Will Ever Recall Pleasant Memories.

Editor Clay-Worker:

There hangs upon the wall by the side of my desk the picture taken of our association in 1897 in front of the Public Library in Buffalo. It is one of the smallest groups that we have had taken at any convention, but it is most highly prized by me, for it contains the pictures of some of my dearest friends in the National Brick Manufacturers' Association whom death has thus early taken from us. Two of these, Oliff and Morrison, never met with us again, and it is the last picture we have of Taylor, and now another, James W. Carson, whose picture looks down upon me tonight from this group, will never be seen again on this earth.

It was my sad privilege to be near our Brother Carson in his last illness, and to be present at the funeral services held at his home in Shawnee. In the room where he died and where his family and friends gathered for the funeral there were hung two pictures, one a portrait of our deceased brother enlarged from the photograph taken at Louisville, with the tobacco-leaf badge of our seventh convention upon his coat, and the other the picture referred to in the beginning of this letter, the group of members of our association taken at the eleventh convention. The former picture was taken only a year after I first met Mr. Carson, and at the convention where I became more intimately acquainted with him and learned to admire him for his kind and genial spirit, and respect him for his knowledge of our art and for the freedom with which he imparted this knowledge to his fellow-brickmakers. Since then I have always looked forward with pleasure to meeting him at our annual conventions.

When, a few months ago, he came to live in the same little town with me, I felt that life there would be more pleasant for me, but it seems now that I had hardly begun to realize the value of his presence before he was taken from me.

When I returned from Indianapolis on Wednesday I heard that he had been taken suddenly ill a day or two before. I called at his house several times until the following Tuesday, when he died; but only twice did he recognize me and press my hand, and only for a brief five minutes was he able to talk to me. It was an acute attack of Bright's disease that carried him to his untimely end, at the age of forty years. He leaves a wife and seven children to mourn his loss. He was given a Masonic burial at Columbus by the lodges of Shawnee and Straitsville, and was followed to his grave by a large number from both places whose regard he had won in his brief residence here. He had the happy faculty of making friends everywhere. He always had a pleasant greeting and kind word for all, and he won the respect and regard of those who worked with him and under his direction.

You know, Mr. Editor, better than I how ready and willing he was to give to the best of his ability the knowledge gained by years of successful practice. The files of your journal and the records of our association are more valuable by the contributions he made. We shall miss him at our annual gatherings, but his name shall be placed high up in the roll of our association with those honored dead who gave so much to promote its interests. We must all follow him, and we know not who will be next. Let us then, like him, do all the good we can in this world, for we know not how soon we may be obliged to leave it.

Shawnee, O., Sept. 8, 1900. W. D. RICHARDSON.

TREASURE THE RECOLLECTIONS OF CARSON.

Dear Randall:

The news of Carson's death comes to me with a peculiar shock. I had felt so glad when he moved nearer, hoping to see him more frequently, and looking forward to long years of happy friendship.

He was so true, and loyal, and earnest, and was one of the men that it seemed we could not spare. I take my place with the mourners for him, and I shall treasure the recollections I have and the friendship I enjoyed. I am thankful that I knew him, even the little I did. and that I enjoyed his royal good fellowship while I could. Sincerely yours, WM. D. GATES.

Chicago, Sept. 10, 1900.

ALWAYS AN ENTHUSIASTIC BRICKMAKER.

My Dear Mr. Randall:

It is with very great regret that I receive yours of the 5th, notifying me of the death of our very dear friend, J. W. Carson.

I have known Mr. Carson a great many years; in fact, my acquaintance seems to date back to his boyhood. I first met him as a very enthusiastic young brickmaker at Thomas Landing, Ill., on the Mississippi river. I have been in communication with him ever since at the several prominent brick plants with which he was connected. I believe he was always very successful.

I often heard him speak of his very dear wife and children. He was a man who certainly loved his family, and always seemed to have their welfare uppermost in his mind. I am quite sure he resigned good positions in order that he might secure better advantages for his home.

Mr. Carson was a prominent man in his business. He was always wide awake to the things pertaining to the best interest of his company. He was one of those men very much set in his opinions or ideas, nevertheless had the rare qualification of easily shifting his position from some pet idea or theory to a new or better way. In other words, he was progressive. Very much might be said to Mr. Carson's credit along these lines. I am sure the N. B. M. A. loses in the death of Mr. Carson a very valuable, progressive, energetic member.

Personally I beg to take this opportunity to express to his family my sincere sympathy in this, their hour of bereavement. I beg to remain yours very truly. W. A. EUDALY.

Cincinnati, Sept. 12, 1900.

GOOD-BY FOR THE LAST TIME.

Dear Randall:

Carson dead! It seems impossible!

While our friends are continually passing away, yet there is a shock of unexpectedness and pain, always different, for in each case, there seems to be reasons why it was unnecessary for Fate to strike down that particular one.

In Carson's case—what a pity! Just in his prime, energetic, careful, thorough, capable and buoyant. How he did enjoy his friendships at the N. B. M. A. conventions, and how we will miss him!

There were subjects that he and I were mutually interested in, and each year were on the lookout for each other, to meet as early as possible, then drop everything else and have a good long visit.

These were of a nature that showed me his character, and I learned to admire his uprightness and fidelity.

Of course, his loss is intensely felt by his family and friends, yet there are many like myself who only met him yearly, whose hearts are pained, and whom it almost chokes to say for the last time—"Good-by, Carson." Yours very truly, C. McDERMOTT.

Wellington, O., Sept. 7, 1900.

SYMPATHY FOR THE LOVED ONES.

My Dear Randall:

I don't know of anything that has shocked me more than your letter informing me of the death of Mr. Carson. My acquaintance with him was, of course, largely though the conventions of our National Association, but my recollections of him are that few men have discussed questions that came before the meetings of those conventions more intelligently, or in a manner showing a more practical knowledge of what he was talking about than he. For a young man he certainly had had a wide experience, and had what so few of us do possess, the ability to put it into words in an instructive and entertaining manner. I am very sorry to hear of his sudden demise.

If you care to publish this I would like also to add that my sympathy goes out to his widow and children. There are few men in our association whose loss will be as severely felt as Mr. Carson's. Yours very truly, D. V. PURINGTON.

Chicago, Sept. 6, 1900.

WILL MISS HIS HEARTY GREETING.

My Dear Randall:

I have yours of the 8th inst. announcing the death of our dear brother, and associate, J. W. Carson. I am truly grieved to hear of his death, and so sudden.

One by one the old guard leaves us, to go into the unknown beyond. We shall miss our old comrade, and his genial face from our gatherings in the future, shall miss his words of council, coming from a long experience in the lines we are working; shall miss his hearty greeting and whole souled fellowship, which seemed to pervade his whole personality. Yes, his words of wisdom we shall no more hear in our councils. His dear family, I am sure, has the sympathy of our entire brotherhood. I am yours very truly, E. M. PIKE.

Chenoa, Sept. 11, 1900.

A CLEAN LIFE AND A THOROUGH GENTLEMAN.

Dear Mr. Randall:

So friend Carson has passed away. The information came to us here indirectly some little time ago, but I felt it must be confirmed directly before it could be believed. It is the unexpected that happens every time. Who would have selected Carson as the next to leave us. Active, in the prime of life, with a good future before him, all is laid aside forever. It was my privilege to be intimately associated with him for several years, during which time I became strongly attached to him for his manly, straightforward character and clean life. He was genial, kindly and a thorough gentleman, and possessed of skill in his profession above the ordinary. The association has lost a valuable member. My sincerest, heartfelt sympathies go out toward his afflicted family. Yours truly, JAS. W. TESTER.

Montreal, Sept. 10, 1900.

AN UNSELFISH, CHEERFUL WORKER.

Friend Randall:

When one is young such sad intelligence as your letter of the 5th inst. imparts passes off without much consideration, but when one becomes older and looks more on the serious side of life, such sad news makes one pause in the busy whirl of business and exclaim, "Can it be possible that he who but recently we met in the very pink of health is to-day in the beyond?" and we ask involuntarily who will be next. It has only been a short time since you and I had the pleasure of meeting friend Carson and his interesting and then happy, but now bereaved family. Little did we think while sitting around that jovial dinner board that so soon husband, father and friend would be no more. It makes one's heart bleed with sympathy for them in this hour of their sad bereavement.

The convention has not only lost an interesting member, but the craft has lost a link in its chain of workers, and we a friend, who was a hard student in his line and who was unselfish enough to give his fellowmen the benefit of his discoveries that life may be more easy to them.

We drop a tear in sympathy for the family who have been so early in life deprived of a loving husband and indulgent father. Yours truly, W. R. CUNNINGHAM.

Bucyrus, O., Sept. 9, 1900.

A FRIEND NEVER TO BE FORGOTTEN.

Editor Clay-Worker:

Sitting in the office of our works at Montezuma, Ind., in the erection of which he took so much pride, in the very center of the field of his former labors, the news came over the wire on the 21st of August that J. W. Carson was not expected to live. It seemed impossible that he, who so short a time ago had severed his connection with our company in perfect health, regretted by one and all, to take up his burden under different surroundings, should, in so short a time, be brought close to the portal of the beyond.

The following day the word came that he had passed away, and the shock of his death was felt very keenly in the small community where his personality had made such a deep and lasting impression.

For myself, I have to thank him for many valuable lessons in the craft in addition to a friendship that shall ever linger in my memory, and I know I am voicing the universal sentiment of our employes and the community of Montezuma at large when I say that his untimely death leaves a void which will be empty for a long, long time to come.

All of his former friends and associates, together with myself, wish to extend our sincere sympathy to the bereaved family, to whom his loss means so much. Yours truly,

Montezuma, Ind., Sept. 10, 1900. F. W. BUTTERWORTH.

ACTUATED BY HIGH IDEALS.

My Dear Randall:

Yours of 5th to hand during my absence in Florida. I am inexpressibly shocked and grieved to learn of the death of Mr. Carson. The National Association has, indeed, sustained a great loss, for he was numbered among our most efficient and faithful members. His genial and noble face will be sadly missed at our annual gatherings. His presence in the past has been so valuable and inspiring, whether on the programme, in the lobby conversations, or serving on the various committees of the association. His influence was felt in all circles, as his chief aim and purpose seemed always to be for the highest ideal in workmanship and dealings with his fellow-craftsmen.

It certainly is an inscrutable Providence that called him from

The late J. W. CARSON, Shawnee, Ohio.

the field of activity in his prime, and the thought should give us pause, in the rush of work, and teach us to be prepared for the dread messenger. May we so order our paths and efforts as to be prepared, like we feel Brother Carson was, to receive the plaudit from the Supreme Clayworker, who molds such beautiful characters from frail clay, "Well done, good and faithful servant."

Our tenderest sympathy goes out to his bereaved ones, and we pray that a loving Father may gently heal the wounded and bleeding hearts. His life should be an inspiration to all the young men of our craft. Yours sincerely,

JOHN W. SIBLEY, Treas. N. B. M. A.

Coaldale, Mo., Sept. 12, 1900.

ONE OF OUR BEST MEMBERS.

Friend Randall:

I am in receipt of yours of the 5th inst., and regret very much to learn of the death of our good friend Carson, words fail me to express the feeling I had when I received your letter.

The N. B. M. A. has truly lost one of its best members. He always seemed willing and ready with advice on most all matters coming before the convention, and one could not help but feel that he was giving it with a view to helping some one out of a difficulty, and they got the best of his ability. I cannot express to you the regret I have that he should be called away so soon, not only from us, but from the widow and children, who have my deepest sympathy in their bereavement. Sincerely yours, H. HAIGH.

Catskill, N. Y., Sept. 8, 1900.

WRITTEN FOR THE CLAY-WORKER.

VITRIFIED BRICK PAVEMENT IN PHILADELPHIA. II.

By Harrison Souder, Civil Engineer.

THE CRUCIAL POINT in a pavement is at the intersection of two streets, and the greatest care should be used in preparing the foundation and laying the brick surface, in order to secure the best results. Various systems of paving for intersections have been suggested. In Philadelphia the double diagonal method is most generally employed. The herring-bone system has been used, though rarely, as it gives poor results The photograph (Fig. 5) is a view of an intersection at Forty-ninth street and Chester avenue, illustrating some faulty paving on this latter system. The worst depression shown, in the right-hand side of the picture, it is fair to state, appears to have been caused by the breaking open of the street surface for the purpose of laying a pipe, but the whole intersection where the paving has not been disturbed is full of hills and valleys.

The double diagonal system is not wholly satisfactory, as slight hollows develop along the lines of intersection, and especially at the center. The writer believes the single diagonal method, as illustrated in Fig. 6, will give the best results where the continuity of the paving is not broken by car tracks. The objection raised to this method by Mr. Jas. Taylor, in his article on "Paving Brick in New York City" (which appeared in The Clay-Worker in November, 1898), that the small triangular pieces laid at the lines of intersection with the main street pavement, sink into the foundations and leave holes, can be overcome easily by the manufacturers making a special brick for intersections, with one end cut at 90 degrees and the other at 45 degrees. These special intersection bricks should have a length equal to that of the normal brick, plus the thickness of the same. The little additional cost of these special bricks

Herring Bone Paving at Intersection 49th and Chester Ave.

would be more than repaid in the saving of time in laying the intersection, and in the better results obtained. Mr. Taylor's suggestion that the diagonal system be applied not only to intersections, but to all street paving, is worthy of consideration, though the writer believes that the best results both as to cost and appearance will be obtained by laying bricks, as is now customary, at right angles to the line of the street.

As showing the requirements for brick paving in Philadelphia, the following extracts from the city's specifications for this work are given:

The crowning or rise of the finished pavement from the gutters toward the center of the street shall be at a rate of two and one-half feet per one hundred feet, except at intersections, or where the surface drainage demands a different crown, as may be directed by the district surveyor. Gutter and crown stakes must be set every fifty feet.

The street shall be excavated and graded from curb to curb accurately to a sub-grade of nine (9) inches preparatory for repaving; this sub-grade to be excavated or graded one full block in length, and thoroughly compacted by rolling with a heavy steam roller weighing not less than five (5) gross tons, until the new surface, from curb to curb, shall be exactly nine (9) inches below the intended finished grade of the pavement and parallel with it. The contractor shall do all filling and leveling to established grades, and soft and spongy places shall be dug out and refilled with coarse sand or gravel screenings, rammed solid previous to the rolling.

Upon the sub-grade, after rolling to a solid foundation, thus pre-

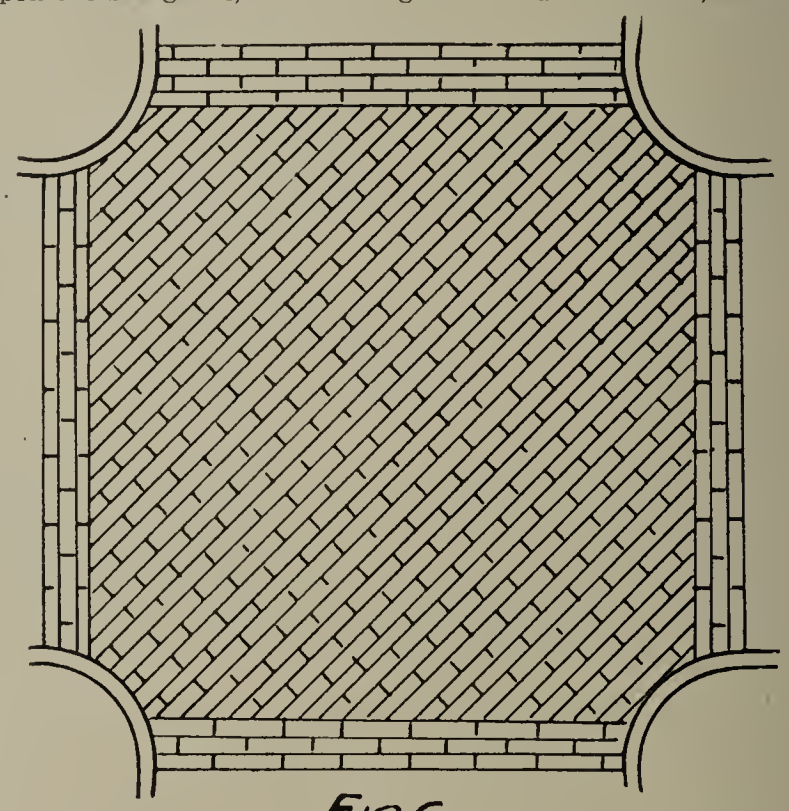


Fig 6

Single Diagonal System of Paving for Street Intersections.

pared, shall be laid a bed of hydraulic cement concrete, four (4) inches in thickness, to be made as follows:

The cement shall be of the best quality, American natural cement, ninety-six (96) per cent, of which, by weight, shall pass a wire cloth sieve of 2,500 meshes per square inch. Briquettes of neat cement, one square inch in cross-section, one day in water after setting, shall have an ultimate tensile strength of fifty pounds, and after seven days in water, one hundred and twenty pounds.

The concrete shall be composed of one measure of cement and two measures of coarse, approved, Jersey gravel, thoroughly mixed dry, and then made into a mortar with the least possible amount of water; three measures of broken stone (limestone, slag, or other equally hard stone), free from dust or dirt, and a size that its largest dimension will pass through a one and one-half (1½) inch ring, to be thoroughly drenched with water, but containing no excess of water in the heap, shall then be incorporated immediately with the mortar, and when rammed, free mortar shall appear upon the surface.

The concrete shall be evenly spread on the foundation and rammed with wooden rammers until thoroughly compacted and has a clear mortar surface; which surface shall be five inches below the grade of the top of the finished pavement and parallel thereto.

No carting or wheeling will be allowed on the concrete until covered by the paving.

The concrete foundation shall be capable of sustaining such test as the Director of the Department of Public Works shall deem necessary. After the concrete is properly set one (1) inch of clean bar sand shall be evenly spread upon the surface to pave upon.

In paving, the contractor must keep the sand foundation to the proper grade or slope at least one hundred (100) feet in advance of his paving; the latter must be laid in sections the full width of the street and not less than one hundred (100) feet in length, the concrete surface to be entirely clean from gravel, rubbish or covering of any description, and thoroughly swept, ready for inspection before the sand is leveled.

BRICKS OR BLOCKS AND HOW LAID.

The bricks or blocks must be vitrified clay or shale, repressed and especially burned for street paving. Bricks shall be eight and one-half (8½) inches long, four (4) inches wide, and two and

one-half (2½) inches thick, and blocks shall be not less than nine (9) inches long, four (4) inches wide and three (3) inches thick. The bricks or blocks must have two or more ribs or projections upon one of the vertical sides, extending from top to bottom; on the opposite vertical side of the brick or block, a groove or channel extending longitudinally from end to end of the brick or block, and connecting with a like transverse groove extending across each end, thus serving by contact with the flat side of an adjoining brick or block to secure a separation, that cementing material may effect a practical encircling of each brick or block, flowing into the grooves, thus keying or locking together the entire pavement.

The Department of Public Works, however, is authorized to accept proposals for street paving with other vitrified bricks, providing they shall be in quality not inferior to those herein described.

The bricks or blocks must be set vertically on edge in close contact with each other, in straight rows across the street, excepting at intersections, which shall be paved at an angle of forty-five degrees to the lines of the intersecting roadways, and those in adjoining rows so set as to regularly break joints. No bats or broken bricks or blocks can be used, except at curbs, where half bricks or blocks must be used to break joints. The bricks or blocks having been set, must be rolled with the above-mentioned steam roller.

After being rolled, the surface of the roadway must be true to grade, and show no continuous lines or unequal settlements produced by the roller.

After being thoroughly rolled, the bricks or blocks shall be grouted with Portland cement grouting until the joints are filled flush with the surface of the bricks or blocks. The grouting to be composed of one part fresh ground Portland cement and one part clean bar sand, and mixed with clean water to a consistency that will readily permeate the joints between the bricks.

The proposal for paving is to be made at a rate per square yard, which shall include any reasonable amount of grading necessary, and all materials, supplies, labor, work and expenses contingent with the paving, to complete the street pavement in a manner satisfactory to the department, and will state the time limit for the completion of the paving of each street; and as part of the proposal the contractor must guarantee the endurance of the pavement for such period of years (not less than five (5) years from the date of completion and acceptance by the city).

These specifications are for new paving to be done under the new loan bill, recently declared legal, $2,000,000 of which will be spent this year in paving our streets. They are practically the same specifications that have been used for brick paving since 1893.

That excellent results can be obtained with vitrified brick, laid under these specifications, is evident to any one who will inspect the many miles of brick paving laid in West Philadelphia, Germantown, Frankford, and the northern and southern sections of the city. The photographs will give an idea of the character of the paving on some of these streets.

Without going into a discussion of the various clauses in the specifications, the writer would suggest some changes be made, increasing the size of the brick and the thickness of the concrete base, as will be noted later on, and substiuting the single diagonal system of paving for street intersection in place of the double diagonal method.

When submitting bids for paving, sample bricks must be furnished the Department of Public Works. These are subjected to special physical tests to determine their durability, Johnson's method of rating being used. A table of the results of some of these tests, made in 1897, is given:

DEPARTMENT OF PUBLIC WORKS.

BUREAU OF HIGHWAYS.

PHILADELPHIA, MAY 1, 1897.

Standard Tests of Paving Blocks and Bricks.

ITEMS FORMING BASIS OF TESTS.

No.	Names of Samples and Where Made	Material and Color	Description: Length in Inches	Width in Inches	Thickness in Inches	Area top surface in square Inches	Volume in cubic Inches	Weight in Lbs.	Specific Gravity	Cross Breaking Strength: Centre load between supports, six (6) inches apart. In Lbs. Per Inch in Width	Crushing Test: Specimen on edge as laid in paving, top and bottom surfaces ground parallel. In Lbs. Per Sq. Inch	Impact: Test No. 1: Thirty minutes in 24-inch Rattler, making thirty revolutions per minute. Per Cent. Loss	Impact: Test No. 2: Sixty minutes in 24-inch Rattler, making thirty revolutions per minute. Per Cent. Loss	Absorption of Water: After drying twenty-four hours at 212° F. weight after immersing twenty-four hours in distilled water. Per Cent. Gain	Rating: No. 1 Cross Breaking	No. 2 Crushing Strength	No. 3 Impact Test, No. 1	No. 4 Impact Test, No. 2	No. 5 Absorption	Total Rating	No.
	Blocks																				
1	METROPOLITAN BLOCK CO., Canton, Ohio.	Shale, Dark Red	10.74	3.91	3.50	37.60	148.10	9.91	2.46	5720	16520	5.35	6.40	.67	5.72	4.13	19.65	18.60	2.33	50.43	1
2	MACK PAVING CO., New Cumberland, W Va.	Fire Clay Yellow	9.00	4.00	3.125	28.13	112.50	9.04	2.49	6246	9930	7.08	6.07	2.29	6.25	2.48	17.92	18.93	.71	46.29	2
	Bricks																				
1	CANTON PAVER, Canton, Ohio.	Shale, Red	10.38	4.00	2.50	25.95	103.80	7.14	2.41	4940	17.810	7.89	10.29	1.22	4.94	4.45	17.11	14.71	1.78	42.99	1
2	MONTELLO CLAY AND BRICK CO., Reading, Penna.	Shale, Chocolate	8.75	4.125	2.875	20.80	85.80	6.97	2.40	4573	12.413	8.95	8.02	1.22	4.57	3.10	16.05	16.98	1.78	42.48	2
3	PERKIOMEN BRICK CO., Oakes, Penna.	Shale, Red	7.75	3.875	2.563	19.9	77.1	6.56	2.50	4460	11.760	8.64	7.45	3.10	4.46	2.94	16.36	17.55	.10	41.21	3
4	McAVOY VITRIFIED BRICK CO., Perkiomen Junction, Penna.	Shale, Red	8.125	3.875	2.50	20.31	78.70	6.78	2.38	5895	10.573	13.43	7.95	3.58	5.89	2.64	11.57	17.05	.58	36.57	4
5	FRANCIS & RAUSCH, Pine Grove, Penna.	Shale, Dark Red	8.25	4.00	2.375	19.60	78.40	6.48	2.25	5866	9.263	11.68	11.82	2.00	5.87	2.32	13.32	13.18	1.00	35.69	5
6	CLEARFIELD CLAY WORKING CO., Clearfield, Penna.	Mixed Red	8.52	3.958	2.413	20.56	81.35	6.54	2.43	6218	12.465	14.43	10.52	2.65	6.22	3.11	10.57	14.48	.35	34.73	6
7	MACK PAVING CO., New Cumberland, W Va	Fire Clay Yellow	8.250	4.125	2.375	19.59	80.80	6.42	2.48	5832	8.738	10.07	13.17	4.81	5.83	2.18	14.93	11.83	1.81	32.96	7
8	HAMBURG VITRIFIED BRICK CO. Hamburg, Penna.	Shale, Dark Red	8.875	4.125	2.50	22.19	91.52	7.22	2.48	5715	8.985	12.42	12.94	2.92	5.72	2.25	12.58	12.06	.08	32.69	8

This is to certify that in making the several tests above recorded, in selecting samples, and in applying the several tests, all conditions, methods and appliances were absolutely uniform, fair and impartial, ten (10) blocks or bricks being used in each case, we certify to the truth and fairness of the above ratings.

Signed, BOOTH, GARRETT and BLAIR, *Engineers in charge of Tests for the Bureau.* *Signed,* THOMAS L. HICKS, *Chief Bureau of Highways.*

The above Record contains the reports of such blocks and bricks as are acceptable for work under the Bureau of Highways. Those failing to meet the Department Standard have not been included in this Statement.

THOMAS L. HICKS,
Chief, Bureau of Highways.

Of course the results given by these tests are only a means to form an opinion as to the availability of a brick for paving, Final judgment, however, can be arrived at only after the brick has been subjected to actual service in the street. Formerly all brick and other tests were made by private firms, but now the city has a well-equipped laboratory, wherein are tested all kinds of materials used in the construction of the public works. Cements, bricks, paints, etc., are subjected to tests, physical or chemical, as may be required to determine their fitness for the work they are to perform.

The operations carried on in the laboratory are recognized by all as being thorough and reliable, and the advantages se-

cured to the city cannot be estimated in dollars and cents alone. Mr. Richard L. Humphrey, the engineer formerly in charge, deserves great credit for bringing the laboratory up to its present state of efficiency.

Studying the table of tests given above, one notices that the "blocks" have the highest ratings, and in general the bricks and blocks with the largest area of top surface, stand the highest. This is as it should be, and confirms the results obtained in actual use in the streets. The impact and absorption tests are the ones of most value for our purposes, though the crushing and breaking tests are interesting in a general way, and aid in making comparisons of bricks. At one time West Virginia bricks only were used in Philadelphia, but now as will be seen from the table, good bricks, manufactured in various localities in Pennsylvania and in other States, are laid in our streets. A considerable number of red shale bricks from the Perkiomen and Reading (Pa.) beds have been laid, some with a ten years' guarantee.

Outside the defects due to the quality of the material and the lack of thoroughness in burning there are two objectional features in many bricks. The first one is that they are not thick enough, and the second is that the edges are made square. This last defect is particularly noticeable in the early paving bricks. The best bricks are now made with rounded or beveled edges. As to the first fault, there is no question but that the wider bricks wear better than the narrow or thin ones. Where the paving is to carry very heavy traffic the writer would suggest that the bricks be made of the following dimensions, 4 inches wide by 5 inches deep by 10 inches long. There may be some question as to whether such bricks could be thoroughly burned. With proper care this could be readily accomplished. For ordinary traffic, bricks 3 inches by 4 inches by 9 inches should be used. The top and bottom edges of all bricks should be slightly chamfered. The smallest sized bricks—8½x4x2½ inches—should be used only for the very narrow streets, private driveways and sidewalks.

With the continued improvements in the quality of the bricks, due to increased care in manufacture and selection of those put on the market, it is only a question of time when vitrified bricks or blocks will be used in many localities where granite blocks are thought necessary. If bricks were laid in place of granite blocks on business streets, the cost would be less, the noise less and greater loads could be hauled and with less fatigue to the horses. For brick pavements subjected to heavy travel the concrete base should be increased to six inches thickness and a higher grade cement used than is now called for. The manufacturer must unite his skill with the experience of the engineer. Each must be honest with the other in striving to get the best results out of an excellent paving material.

A distinct advantage which vitrified brick has over other paving materials is, that besides being cheapest, it is equally suitable for paving on level streets as on streets of steepest grades. There are some instances in Philadelphia where asphalt has been laid on such steep grades that it is dangerout to drive over it in wet or frosty weather. For grades over 2½ or 3 per cent. at most, vitrified brick or granite block should be used, preferably the former.

CEMENT FROM FURNACE SLAG.

For some time interesting experiments have been conducted here for the purpose of better utilizing blast furnace slag in the manufacture of cement. This waste material has for some time entered into the manufacture of some cements, as well as having been used in other ways. The molten slag is now granulated in running water, dried, ground and mixed with limestone and slacked lime. The process now being put forword presses this mixture into briquettes and these, after having been burned, are ground after the manner of the usual Portland cement clinker. In this great iron and steel manufacturing district of Pittsburg the question of utilizing or disposing of the slag from the furnaces has long been a troublesome one. If the industry of manufacturing slag cement becomes sufficiently developed it will do much to solve the question.

CONSTRUCTION AND MAINTENANCE OF BRICK PAVEMENTS*

By E. A. Kemmler, Assistant City Engineer, Columbus, O.

AFTER A CAREFUL survey of the field of materials available for permanent street improvements, we are irresistibly drawn to the artificial product made from the traditional clay, as the most promising paver, the one upon which our greatest hopes for the future are based. It may therefore be of some interest to cite a few facts. by way of introduction, gleaned from fourteen years' experience with this class of paving material in my native city, Columbus, O.

We have to date 114 miles of paved streets, being about one mile for each 1.100 population. About 10 per cent, of the total

E. A. Kemmler, C. E., Columbus, Ohio.

yardage is of brick and artificial blocks, comprising in all twenty-six varieties.

All of the pavements, excepting about three-fourths of a mile laid since 1898, are upon an eight-inch foundation of broken limestone or gravel, and having, with few exceptions, tarred joints.

The first pavements were laid with West Virginia fire-clay bricks, made at New Cumberland, W. Va., the first paving brick manufactured in this country. These pavements were laid in 1887. the same year in which the Canton factory, the first in Ohio, was opened.

All of the pavements laid on residence streets (about 85,000 square yards) are still in good condition, and will last from eight to twelve years longer with proper maintenance.

The heavy traffic on the business streets has not dealt so kindly with them, however, and a considerable area has worn

*Paper read before the American Society of Municipal Improvements, Milwaukee, August 29, 1900.

out, owing very largely to the total lack of repairs. From three to five years could have been added to the life of these pavements had repairs been commenced in time.

The bricks have generally worn flat, with a small percentage of chipped and rounded bricks, in spite of the inferior quality of the filler used.

—Streets Paved with Building Brick.—

During 1888 and 1889 a large area was paved with hard-burned red building bricks, principally on streets subject to light traffic. With the exception of a small area, laid on sand and tarred board foundation, these pavements have stood up surprisingly well, in spite of no repairs. About 60 per cent. are in good condition to last from five to eight years longer.

From 1888 to 1892 about 292,000 square yards of Hayden block pavement were laid. This is a half-hollow block made from fire clay, six by ten inches on top and five inches deep, having three rows of square beveled depressions three-sixteenths of an inch deep on the wearing surface, the hollow spaces underneath being filled with clay before being laid. About 30 per cent. have failed under heavy traffic; the balance will last from six to ten years longer. The greatest amount of wear has been at the edges. A hard filler would have added materially to the life of this class of block.

Since 1892 almost every variety of block made in Ohio has been used, with varying degrees of success, the fire-clay bricks giving the best results in the long run. This is no doubt due to the fact that the fire-clay bricks are less brittle than those made from shale and the use of the tar filler.

Cement as a filler has not been used since 1892. Its disuse was due to an unfortunate experience. In 1891 and 1892 Murphy grout was used on a number of brick streets, and the results were anything but gratifying. Within a short time the pavements failed in many places by bodily settlement in rectangular patches, and longitudinal cracks at the center, as much as a hundred feet in length. As the foundation was not of concrete, these settlements were no doubt due to local rearrangement of the foundation aggregate and absorption of the sand cushion. The characteristic rumbling, at first quite noticeable, disappeared almost completely after the final settlement, but the pavements had acquired an unsightly, pock-marked appearance. their beauty and symmetry were destroyed, and the settled portion rapidly wore into chuck-holes after the cement had become loosened from the joints. The portions remaining intact are still smooth as a floor, and almost as good as new. Instead of improving the plans for this class of pavement by substituting concrete for the broken stone foundation, snap judgment was taken upon the cement filler, and its use abandoned. There are many, including the writer, who will dispute this conclusion.

—Twenty Years the Average Life of a Good Brick Pavement.—

As a result of our experience with brick pavements I am prepared to estimate the average life of brick on concrete foundation, and with proper maintenance, at from eighteen to twenty years, under the conditions of traffic which prevail at the capital city of Ohio at any rate.

An average of the estimates given me by twenty city engineers, from every part of the United States, reduces the life of brick to fourteen years, but our experience justifies a larger figure.

Having given this outline of our early lessons in brick paving, I shall attempt a brief discussion of present standard practice, which is calculated to give the best results of this class of pavements.

To begin with, a hard, dry subgrade is as essential as a good foundation. All soft or spongy places should be treated very thoroughly by removing the soft earth, if shallow, or rolling the gravel or crushed stone into it, until it becomes firm and hard.

All house service pipes from sewers, gas and water mains, not already in place, should be laid to the curb lines. The back filling of all trenches should be done by or under direct supervision of the street contractor, who must guarantee the pavement over the same. Whether the back filling is to be done by ramming alone or partly by flushing will depend upon the kind of material. Stiff, sticky clay cannot be settled satisfactorily by either method. Such trenches should first be filled a few inches above the general surface, then thoroughly rolled and finally excavated from four to six inches, so that the thickness of concrete over them will be increased to ten or twelve inches.

Testing Crown of Concrete Foundation.

Laying Paving Brick

A Brick Paved Street Ready for the Filler.

It is essential that the surface of the subgrade conform as nearly as possible to the adopted crown of the street. It is therefore best to delay the final dressing until after the curb and subdrains have been laid. The necessity for subdrains will depend, of course, upon the nature of the subsoil. They should be laid close to the curb. Our present practice is to lay them just outside the curb, thirty inches below the top of the curb, with a covering of screened gravel. The trench for the curb is dug at the same time.

Curb is set upon six inches of gravel or broken stone, and backed with six inches of the same material. For the best results, however, concrete should be used instead of loose stone.

After setting the curb the subgrade should be finished and rolled with a steam roller weighing not less than 250 pounds per lineal inch. It is then ready to be thoroughly inspected and tested for inequalities of surface. All high places varying more than one-fourth of an inch from the true crown should be leveled off, the low places being left to be filled with concrete.

The next important step is the laying of the foundation. Six inches is generally accepted as the economical thickness of the concrete. As the work progresses small wooden stakes should be driven at intervals of five feet to serve as guides in spreading and ramming the concrete.

The platform should be of steel boiler plate. The sand should be silicious if possible, containing not more than 3 per cent. of clay; it should be dry when used. The sand and cement must

be thoroughly mixed by hoes until the colors have completely merged. The proper percentage of water will vary with the temperature and the humidity of the atmosphere. Enough water should be used to prevent the concrete from drying too fast, but in no case ought the mixture to be so wet that the mortar will run off the board and the cement settle into place without vigorous ramming.

My own experience has been that, under the most favorable conditions of the atmosphere, the dryest mixture yields the best results. but I have also learned that it is unwise to make the concrete so dry that the mixing of the mortar tires the men. Lack of uniformity in the product is certain to follow such a course. If the concrete were mixed with machines the amount of water could be regulated at pleasure without sacrificing uniformity, but not with unskilled hand labor.

—Importance of Little Details in Methods of Construction.—

Too much care cannot be given to reducing the variations of the concrete surface from the true crown to a minimum. For unless the sand cushion forming the paving bed be of uniform thickness no amount of ramming or rolling will settle the brick so that they will possess equal power of resistance to vertical pressure.

In order to prevent the concrete from drying too fast on the surface, it should be covered as soon as practicable with a blanket of paving sand, which should be kept moist by sprinkling as often as necessary.

There has been some discussion as to the best thickness of the paving bed, the opinion of the engineers varying from one-half inch to two inches. Taking as a model Detroit, with its magnificent streets paved with brick transported from the Buckeye State, we would use a bed one inch thick. I have found an inch to give excellent results. One point gained by a thin cushion is the extra care used by the contractor in shaping the surface of the foundation.

The sand for the bed should be soft and velvety, rather than sharp and soft, for the former on account of the cementing property of the clay remains hard and stable after ramming, while clean sand cannot be rammed into equilibrium. A calcarous sand containing 12 per cent. of clay has given the best result in our city.

Practice varies in the manner of settling the brick upon the bed, some engineers specifying ramming, others rolling. I have found that ramming alone, while more effective than rolling, does not produce as even a surface as rolling, while rolling alone has a tendency to tilt the brick. We therefore require both ramming and rolling in the order mentioned. The results have been highly satisfactory. Defective and broken brick are picked out and replaced after the pavement has been rammed, but the pavement is again inspected after rolling to detect any bricks which may have been broken during that operation.

—The Question of Fillers.—

We now come to a critical point in the construction of our pavement, the filling of the joints. So far no filler has been invented which will meet all objections, and as the opinions of engineers are so radically different, it is impossible to prescribe any class of filler which can be pronounced as the best under all circumstances.

So much is certain: Sand has the advantage of cheapness, but offers no protection to the brick against chipping.

Tar pitch, which is expensive, gives excellent service as long as it remains in the joints, but summer temperature and the law of gravitation cause it to flow and collect in the gutters, where it remains a thick, unsightly scale.

Cement grout, while much cheaper than tar or asphalt, produces far better results upon a well-constructed street, but in such cases as the experiences of Columbus it will certainly do more harm than good.

From one of the best papers prepared for the last meeting of the National Brickmakers' Association, by George R. Grimes, of Terre Haute, Ind., I quote this sentence: "In my judgment the cement filler is the best, and none other should be used." The discussion which followed brought out the following from one of the members: "The brick streets of this city (Terre Haute) show for themselves that Mr. Grimes is thoroughly competent to discuss this subject. They have brick streets there that have been down under fairly heavy traffic for six or eight years, and they are just as smooth as this marble floor. The splendid condition of those pavements is due to the great care exercised in the little details of the work—the laying of the brick, preparing the filler and rolling the brick." In direct contradiction to Mr. Grimes I quote a statement of your president, made at the Toronto meeting last year: "My conclusion is that Portland cement is not a proper material to use for such a purpose." My own view of the matter is that a filler having such excellent quality as the cement grout should not be discarded without a fairer trial than it has had thus far. If the rumbling noise is due to expansion of the brick, occasional joints of tar or asphalt ought to remove this defect. If the failures are due to settlement of the foundation or sand cushion, the substitution of Portland for natural cement and a thinner and more carefully prepared sand cushion ought to remedy this trouble.

I have often thought that it would be a good plan to fill the joints with sand at first, and apply the grout a year later, after first cleaning out the joints with a jet of water or air blast. Surely no appreciable settlement can occur after that. I am satisfied that our original pavement, laid twelve or fourteen years ago, especially the Hayden block, could have their life increased from three to five years by such a course applied even now.

—The Street Car Track Problem.—

The presence of street railway tracks on a street greatly complicates the problem of paving, especially where there is any doubt as to the authority of the engineer over that part of the roadway.

Wooden cross-ties are objectionable for reasons unnecessary to mention. Two years ago an experimental piece of track was laid by the Columbus Railway Company, upon longitudinal stringers of Portland cement concrete, made in sections of about twelve feet in length. The rails were laid directly upon the concrete without cross-ties, and held in place by bolts imbedded in the concrete.

This work has stood up very satisfactorily, and the pavement has remained even, while the track alongside, laid upon wooden cross-ties, is already exhibiting evidence of internal disturbances of the paving material.

We now specify longitudinal stringers six to eight inches deep under the rails, with cross-ties of angle bars spaced six feet apart, and a nine-inch full-grooved rail, for all new work.

All bricks used on our streets during the past three years have been tested in accordance with the National Brick Manufacturers' Association standard. The tests thus far have not given results which would inspire one with confidence in the method of testing. Bricks known from experience to be of poor quality, bricks that would be rejected by an experienced paver, were in many cases shown by the tests to be equal to the best, those that were known to be the best; but when these bricks were laid upon the street, when the real test was commenced, they were found sadly wanting. It is therefore very gratifying to note a recent test of seven varieties of paving brick at Columbus by Association rattler test, using foundry shot in addition to the bricks. The test placed every variety of blocks in that class or grade of quality, where experience with its use on our streets would require it to be placed; hence our confidence in the rattler test has gone up several points this year.

—Our Method of Inspection Wrong.—

Before the art of modern street paving will attain its highest perfection, the "political" inspector must be abolished. The high class of workmanship required, and the many important little details connected with the work demand intelligent and competent supervision. The "political" inspector can do no good; he can do harm by causing unnecessary disputes and delays. He is a mill weight on the shoulders of a good contractor and a source of continual annoyance to the engineer. It is far better to dispense with an inspector altogether; but if we must be afflicted with his services I would advise instructing him

to "saw wood" at all doubtful stages of the work and call the engineer.

But if those in authority really desire to have a man of experience and ability for the one representative of the people who pay for the work and the inspection, and who is on the work all the time, they ought to select the best in the field and pay him a decent salary.

Much as been written upon the subject of highway construction, and much more could be said of this subject upon this occasion had we the time; but I expect to read more about the proper maintenance of paved streets during the next century than their construction. We denizens of the nineteenth century, with our short experience, have learned fairly well how to build good streets, and we have built them as rapidly as we knew how, and in accordance with the good old American custom, without any thought as to the future.

—Value of Street Improvements.—

From such figures as can be obtained, the total original cost of street improvement in the United States has not been far from $500,000,000. Columbus alone has paid in round numbers $5,000.000 for paved streets, equal to one-eighth of the total decennial appraisement of its real estate. Unfortunately, American cities have not yet commenced to learn the art of maintaining their street pavements. The necessity of preserving from rapid deterioration and ruin this enormous wealth showered upon the municipalities by their public-spirited and progressive citizens has not yet dawned upon our cities, with a few notable exceptions like Philadelphia, Buffalo and Detroit.

The 1,050 miles of improved and 430 miles of unimproved street in Philadelphia are the pride of its citizens and the authorities claim for that city the first rank as a paved city. Durin the year 1899 $510,000 were expended for repairs alone, besides $1,334,514 for removing cobblestone and rubble pavement and repaving with asphalt. The entire work was done by contract and paid for out of the city fund. I may remark, by way of parenthesis, that we have saved a considerable percentage of the cost of replacing the cobblestone pavement with asphalt by using the old pavement as a foundation. It may sound strange, but our best asphalt streets to-day were laid upon old bowlder and stone block foundations. Buffalo and Detroit likewise have liberal funds at their disposal for the maintenance of streets, and the results are apparent upon an inspection of their pavements.

We at Columbus know absolutely nothing about street maintenance; Cleveland, the largest city in Ohio, knows just as much as we do upon this subject—$17,542 was the total amount expended for repairs in that city last year, which caused the following observation from the superintendent of streets in his last annual report:

"When it is taken into consideration that there has been added over nineteen miles of new pavements, hundreds of catch-basins, and that many additions in miles of pavement and numbers of catch-basins will be made during the ensuing year, it is plainly evident that the present appropriations are totally inadequate, a fact which compels us to forego taking up and carrying to completion the many necessary repairs."

Cincinnati is not far ahead of us except as to the asphalt streets. And this in the State where brick paving originated, and where the paving brick factories are, as it were, within a stone's throw of each other, where the bricks laid in the streets which are the pride of Detroit are made.

If this is the status of the science of street maintenance in Ohio, what is to be expected in States less favorably located, as to the cost and quality of the paving materials?

I believe that it can be shown from actual experience that it costs no more to maintain a brick pavement than to let it wear out without repair and repave the entire surface. The diminished wear and tear of vehicles, immunity from damage suits and the decided advantage of continued good appearance, are some of the immediate points gained by the former course.

—Streets Should Be Kept in Repair.—

Take, for example, one of our worn out brick streets, twelve years old. It is safe to assume that this street could have been maintained without repaving for at least sixteen years at a cost not exceeding $0.50 per square yard. The annual cost is as follows, assuming cost per square yard at $1.50 on interest at 4 per cent.:

—Without Repairs—Life Twelve Years.—

Interest	$0.060
Sinking fund	.100
Total	$0.160

—With Repairs—Life Sixteen Years.—

Interest	$0.0600
Repairs	.0310
Sinking fund	.0687
Total	$0.1597

As a purely business proposition these figures indicate that it is worth $0.50 per square yard, paid in sixteen annual installments, to prolong the life of this particular street 33 per cent.

But the dollar-and-cent way of contemplating this problem is certainly not the most enlightened one at this stage of civilization. After the streets have been paved they must be maintained for the sake of appearances and safety to travel, aside from all financial considerations. If the money for maintenance is not in sight the street should not be built.

As to the manner of apportioning the cost of maintenance, the Philadelphia plan of maintaining all the streets, both improved and unimproved, out of the general revenues of the city seems best adapted for the larger cities with very few unimproved streets. For the smaller cities, with a large percentage of unimproved streets, a modification of the Buffalo plan of paying the cost of repairing out of the general fund, and assessing the cost of repaving upon the abutting property, would seem to be the most equitable one.

The Buffalo charter requires the asphalt streets to be repaired by the city, unless more than one-third of the roadway is in need of repairs, which is the weak point of this plan. The stage at which the asphalt streets can be economically repaired has passed when the percentage of annual repairs necessary exceeds 10 per cent. of the total roadway.

One of the greatest enemies of paved streets is the poorly back-filled trench, for whatever purpose opened after the pavement is laid. There is but one effective way of preventing settlement over the trenches, and that is by requiring a permit to be issued for every such opening, for which the contractor must pay liberally, besides making a deposit sufficient to cover the cost of refilling and repaving over the opening, this work to be done by the city. The permit fees can be used to swell the repair fund.

—Damage Caused by Tearing Up Pavements.—

Last year several miles of our paved streets were torn up by the natural gas and telephone companies. The work of refilling and repaving was done under the authority and supervision of the city engineer, who required the use of four to six tampers to one shoveler in back-filling. The work was well done. In but two cases has there been any settlement over these trenches and the pavements have not suffered a particle on account of these openings.

Columbus has twice secured legislation for creating a repair fund by the licensing of vehicles of all classes, but just as often the laws were tested and declared unconstitutional. There is quite a number of cities, however, where such license laws and ordinances are effective, and the revenues from this source form an appreciable addition to the repair fund.

The annual cost for repairs alone is but one-fifth of the total cost of a street, as shown by the figures in the example presented above, and the property-owner is certainly making a modest demand upon the city when he asks it to pay the cost of keeping his street in good repair during its natural life.

It is not difficult to picture the state of a man's mind who is paying street assessments year after year, at the same time seeing the roadway in front of his house wear full of chuck holes and finally go to pieces long before the last asssessment has been paid. It certainly looks like confiscation, or in plainer words, highway robbery, to a disinterested person. But "all things come to him who waits," and the Twentieth Century will no doubt dispose of this question successfully, as it will of the many problems connected with municipal government in this country.

This association is to be congratulated upon the great work

which it has already accomplished in this direction, and the recognition and prestige which it has gained during its short career, and it can be confidently expected that its scope and usefulness will grow apace as it grows older and stronger, gathering momentum and energy with each day of its existence, so that its influence will come to be felt in every progressive community in the United States.

Written for The Clay-Worker.

GOOD ROADS A PAYING INVESTMENT.

ROBABLY NO STATE excepting Massachusetts has such a perfect system of roads as New Jersey. And Massachusetts has not been able to accomplish all that was intended when the State Highway Commission was created. That proposition being true it follows that the present system in New Jersey is incomparably the best yet constructed, taken as a whole. But even with that there must be some qualification. The material of which the highways are constructed is not permanent and requires frequent renewal or it fails. In other words, while the initial cost was comparatively light the expenses incident to constant repairs have made the system exceedingly costly. Perhaps this is not due entirely to any fault of the builders, but is inherent in the original scheme which did not contemplate such heavy traffic, and therefore the early builders specified broken stone as sufficiently lasting to serve the purpose.

But even with the cost running up into the millions (without statistics at hand it is impossible to be accurate), taxpayers are well satisfied, and there is never any complaint of the appropriations, and representatives in the Legislature seldom oppose the annual appropriation when it comes up. It is a business proposition. The improvement of roads has increased the value of real estate until it has more than paid the cost and the same real estate is more valuable to-day, after paying all the expenses, than it would have been without the improved roads. It proves what advocates of better roads have contended for years, that the increased valuations, incident to the improvement of highways in a given section will pay at least twenty-five per cent. more than the additional cost of building roads.

The question naturally arises in the case of New Jersey, how much could have been saved on the original cost had brick been use instead of macadam? Probably a larger proportion will answer nothing and they may be right. But when it is considered that macadam must be watched daily to be kept in proper repair, that the repair bill increases with the increase of traffic, and increased traffic is always a result of an improved road, the inference is plain, that in the end it would have been less expensive to have built the roads of brick. It is no argument to say that brick would not stand the traffic. They stand it in cities where there is many fold more traffic than in the country, and where there are heavier loads hauled. An experienced road engineer told the writer not long ago that in his opinion New Jersey would have been able to construct at least one-third more road had brick been used than has been built under present circumstances.

It is rather curious that brick, while one of the oldest materials used for paving, was not employed in the United States for that purpose until twenty-five years ago. The first brick pavement of which there is any record was laid in Charleston, W. Va., in 1872. Since then it has come into general use everywhere, and there isn't a city or town of any size in the country which hasn't more or less. Some of the advantages have been summed up by a prominent engineer, who always specifies brick, when he has an opportunity. At the risk of repeating, which, after all isn't such a crime, provided an argument is made emphatic, what he said is here reproduced:

"Ease of traction; good foothold for horses; not disagreeably noisy; yields but little dust and mud; adapted to all grades; easily repaired; easily cleaned; but slightly absorbent; pleasing to the eye; durable under ordinary traffic."

The case couldn't be better summed up, and in every statement there is a strong argument for more brick, brick made with the object in view of supplying paving material that shall have all the requisites named and that will not cost an excessive sum.

The defects which have caused advocates of paving to hesistate at specifying have been due more to uneven quality than any other one thing. There was likely to be a good many bricks in any pavement that would crumble under the traffic or by absorbing water which burst the brick upon freezing. But in a majority of instances these irregularities have been overcome, and as a rule a pavement will run perfectly even so far as wearing qualities are concerned, and where there are porous specimens they can be detected before laying and thrown out. There will be defects from the best of kilns, but they are so slight that they really amount to nothing, and the percentage thrown out will be too small to consider.

Regarding expense, it is found that an average of paving laid in eighteen cities has been about $1.75 per square yard. Some have been as high as $2.25, others as low as $1.00, but $1.75 is about a fair average. These are small cities, where the traffic is about the same as on the main roads in a thickly populated country community, in which there are numerous large towns. It is seen from this that the cost is not prohibitive for even country road building, particularly where the country or state is guaranteeing the bonds and they run for long terms. With such improvements the abutting property becomes more valuable, and the improvement in transportation facilities enables owners of farms to secure a better market for their produce, taking advantage of high prices, regardless of the conditions of the roads, and thus they are benefited in numerous ways. The increase in individual taxes is almost too small to be calculated. And when this fact is understood it is likely that a larger proportion of the more enterprising country communities will insist upon improved highways. If the process of educating them is carried a little farther and they are shown what benefits accrue from using brick there will be no longer any question of the improvement of highways.

New Jersey and Massachusetts have their highway systems under way. What has been built will probably be left as it is. But there is a strong movement in some localities in New Jersey to secure a proportion of brick in the additional improved highways to be built later. It promises to be successful. It is suggested that brickmakers take more pains to see that the proper literature is circulated among the authorities having the work in charge, and further that what influence is possible is brought to bear. It would mean considerable to more than one manufacturer if this result could be obtained. The expense of securing such a concession need not be large, nor need the advocacy of it be accompanied with any unpleasant features. It is simply to urge the substitution of brick for crushed stone and show by convincing figures where the benefits would be.

In Massachusetts it would be more difficult. The system is rather in a political rut and there are some powerful interests which are supplying the crushed stone. The political exigencies compel the expenditure of the money in different counties according to the proportion of the taxes paid by that county, and it might, under such circumstances, be difficult, if not impossible, to secure a change. But even with the prospect more or less discouraging it is worth trying.

The great opportunities lie in the States which as yet have begun no series of roads. It won't be long before all the leading States will be compelled by popular demand to undertake road improvement on a hitherto unprecedented scale. A law was passed in New York last winter authorizing the construction of highways under the direction of the State. Other

States must follow, and before any of them have begun, the claims of brick paving should be brought before them in as convincing a manner as possible, with the assurance, that, if properly presented, there will be no question of the adoption of brick, at least on the roads having the heaviest traffic, where macadam would be always requiring repairs.

This is a subject which brick men should interest themselves in with all their energies. It means a largely increased business if it is adopted, and with sufficient pressure there need be no doubt about the result. A majority of those charged with road construction know comparatively little about the relative qualities of different material; and the only reason that asphalt has become so popular is because the manufacturers have organized a combination for mutual benefit and urge the claims wherever any new paving is to be laid, and they urge it frequently with an argument that is often more convincing than mere words. While that method is to be deplored, it becomes necessary to resort to tactics closely allied to those selected by the enemy if one hopes to win the battle.

BURTON.

Written for The Clay-Worker.

BUTTON-HOLE TALKS.

"MAY I TELL you my troubles?"

We were out on a pleasure trip, in an effort to rest tired nerves by abandoning home comforts for the uncertainties of travel. Our steamer had struck an excursion crowd and the accommodations of the boat were inadequate for the large number of passengers. Men, women and children were sleeping on lounges, chairs, and even on the floor, and there was indeed "no rest for the weary."

He was about forty—long, lank and lean—and he came up to me with a steamer blanket hanging over his arm and a wild, sleepless look in his eye, and this exclamation on his tongue:

"May I tell you my troubles?"

It was so unusual for any one to make this request that it startled me. Everyone else just bolted in and told their troubles without asking permission, and he was so quiet about it. The very first of his kind. I took his finger and hooked it into my buttonhole—he didnt' even do that himself—and told him he had come to the right place, to make himself comfortable and proceed. He sighed contentedly, leaned heavier on me and continued: "Stranger, I'm up against it! Is there a doctor aboard?"

I said likely as not, and told him I would go see the steward and find out. He clutched my buttonhole more firmly and leaned more heavily on me as he said:

"No, no. I don't want him. I want to keep away from him. If he should spot me I'm a goner. Let me tell you. You see I just now got off here in a quiet corner, out of the wind, and I wrapped this blanket around me nicely. I got a couple of chairs and sat in one, nicely tilted back, snuggled my feet in another, and was just ready to doze off into a nice, comfortable nap, when I happened to think that I ought to take some medicine to help take care of what little stuff I got in the grand rush at the supper table. Mother, at home, believes absolutely in homeopathy. 'Like cures like,' you know. Hair of the dog cures the bark—no, bite, I guess it is. I myself think the little pills are good enough for women and children, but for my own part, when I am away and can, I just sneak in, on the quiet, some good old patent stuff, that is put up to scatter and hit anything. So I reached sleepily down in my vest pocket for a Bidams tabule, slipped it quietly into my mouth, swallowed hard, and, stranger, I put down a pants button; that's just what I did. I have it with me. I have it for keeps. There's a button in my anatomy and I can see my finish. Just let one of those crank doctors sight me and my appendix 'll be in a bottle. That's what I'm up against. Now I've got it I don't want it, but I don't want the doctors to take it away from me, either. Wish to goodness I'd stuck to mother's advice and never downed anything but little pills. Even if the blamed thing don't kill me and I escape the doctors, why, just as likely as not, it'll change my whole manner of life. Ike Bliss, when he was a boy, swallowed a cent. Now he's a banker and keeps a safety deposit vault. Joe Smith swallowed a quid and now he's in the wholesale tobacco buinsess. I see my finish, even if the doctor don't bungle my appendix. I'll just end my days a tailor. Just fixin' the buttons where they won't get into appendixes. Darn a loose button anyway. Nobody but a fool would carry them around in his vest pocket anyway. But, say, come to think of it, what in thunder does Bidam mean anyway in putting up medicine in button shape. Oh, mother, why didn't your wandering boy heed your sugar pill advice. They never masquerade as buttons, and even if they don't cure they certainly never kill."

He absent-mindely rubbed his hand over his abdomen and shuddered, as a man with a professional look and a grip that looked like a surgeon's toolchest came in over the gang plank, but rallied and proceeded to comfort bimself that it was just a plain, old-fashioned button and not a new-fangled self-fastener that might attach itself to his internal economy and go looking for things to hitch to. Then he reverted again, in terms by no means complimentary, to medicine makers who put up their wares in button form, and, reaching down into his vest pocket for a tabule to illustrate, he produced a pants button. A marked change came over him instantly. His face lost length and gained breadth. His form straightened. His chest expanded. He lost his stoop, while a smile went rippling out all over his face, chasing back and playing tag with his ears, and his eyes had a happy twinkle as he exclaimed: "Beg pardon, stranger. My mistake. This is sure one on me. I have the button here, and it's the tabule that's inside after all."

GATES.

A FINE RECORD.

MASON CITY BRICK & TILE CO.,
Manufacturers of
Wire Cut Brick and Drain Tile, Hollow Bricks and Building Tile and Vitrified Sidewalk Brick.
O. T. DENISON, Prest. and Manager.

Mason City, Iowa, June 26, 1900.

Madden & Co., Rushville, Ind.:

Dear Sirs—One of the No. 5B machines bought of you in November last was started May 15 and has been doing excellent work every day since. The other one we placed in our old factory, taking the place of the No. 5B we bought of you in December, 1893, which needed re-babbitting. The old machine is all right, does good work, but we had not time to babbitt it, hence on May 31 we put the new one in its place. The new one started off in fine shape, doing as good work as we can ask for, and has not delayed us one minute, making on the average 45,000 per day of ten hours. I am certain that we could easily make 70,000 per day if we could take care of them.

The old machine has been in operation almost constantly since it was set up, running through the year, and has done as much work as a machine would in a summer yard in 12 or 14 years, and is good for many years yet. Our fires have not been out in three and a half years, and since the machine was first started it has not lain idle three months in all.

I am pleased to add my testimony to the efficiency of your machine, its strength and durability.

We are away behind our orders, fully a month, and doing all we can to "catch up."

Wishing you abundant success, I am very truly yours,

O. T. DENISON. P. L.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

MIDSUMMER REFLECTIONS.

IT MIGHT TRULY be said that during this long protracted spell of heat that all brickyards look alike to me—but they don't. For this very reason, that some men, born with a very consistent vein, will, while ventilating their cussed opinions of this heathenish weather, that's only fit for baked beans and split chickens, invite you under the shelter of the cool tempering pits and proceed to talk anent the hard frosts of former winters. While the less consistent individual invites you into the sizzling atmosphere of his newly finished dryer, where the glass registers 160 degrees, and you both warm up on a dissertation of the advantages of having a dryer as a modicum of comfort and economy. All your aggressiveness departs; you are gradually being par-boiled; you will acquiesce to anything; your shoes are cracking and your celluloid shirt buttons are slowly reaching the stage of decomposition—but when he invites you, in all the kindliness of his hospitable nature to take a seat—then it is that all the frostiness of your pent-up dignity asserts itself; that cold, steel-like glitter in your eyes betrays and warns him, and he quickly proceeds to say: "There's just one thing I want to show you; then I guess you'll be glad to get outside."

The man suddenly released from the bastile or the blue white army of General White, at Ladysmith, did not come nearer to the exquisite sense of regained liberty than did I as we emerged into the open, where the thermometer registered only 99 in the shade.

Murrell Dobbins says he can hardly believe this warm spell is going to last all the winter, and I very cheerfully concur with him.

Business generally has suffered; men have been robbed of all ambition, while some haven't energy enough to pay their bills.

In a recent contract given, Murrell Dobbins captured the Girard estate building of eight stories, to be erected at Third and Chestnut streets. This for the walls and a brick roof will soak up nearly 3,000,000 of his well-known bricks. The power house to be erected in the rear will also take a few extra thousands. A neat little operation of sixty-five twin houses, to be erected at Chestnut Hill, will also be served by him to the tune of over a million and a half; and while he says there's nothing doing down in the yard, the prospects are bright, so, like John Chinaman, he evidently has a trump up his sleeve.

A change has been made at the yard of

—Frank and Thomas McAvoy,—

at Thirty-first and Dickerson streets. In June last Frank retired and now confines himself to the interests reserved by him as president in the yard below, now known as McAvoy & McMichael, while Mr. H. A. Morris steps into the vacated place, assuming all the liabilities of the yards in active co-operation with his brother-in-law, Tom McAvoy. Henceforth this yard will be known by the shingle

—McAvoy & Morris.—

Both are pleasant fellows, and at the next convention their papers will bear the legend:

—"How to Make Bricks and How to Sell Them."—

It being rather early in the day to ask them how they're progressing, we will leave them for a visit in the fall, when I hope you'll get good reports from the "boys."

—The Late Samuel Huhn's Yard.—

two blocks above, is still running, and everything in apple-pie order. The same familiar faces greeted me, from the clerk, Foreman Barton, who has been connected with the yard since 1865, to the burner, who has put in forty-seven years of honest toil in the same place, and who claims to be the only wood burner in all Quaker City, to the engineer, claiming a service of twenty-one years.

The yard was first established in 1837, by the grandfather of the present incumbents in fee, Samuel L., now in his twentieth year, and his younger brother, Charles G.

The bricks of this yard always found a good resting place, and many a federal and municipal building can be identified with the famous pressed brick turned out in this yard, and which brought in many an order from New York until Trenton N. J., stepped in and collared the trade.

The newest servant about the yard is the Martin dryer, and right here let me say that Foreman Barton is to be identified with consistency. He said: "You can look at it for a minute, and we can do the talking part outside."

The dryer measures 120 feet by 8 feet, standing 10 coils pipe high and set 9 feet from post to post, each section holding 11 pallets, with an aggregate capacity of 25,000.

During this warm spell the men have orders to turn out 32,000 daily. This allows them to quit at 2:30 p. m., the remaining 7,000 brick being hacked and dried out in the open.

The machine is one of the Tiffin latest improved horizontal Ohio make, is fed by a 60-horse-power side arm Rochester engine and two boilers, 100-horse-power, clay being hauled up to the crusher, thence to the pug mill.

Foreman Barton is enthusiastic over the merits of the dryer, his only regret being that it was not installed ten years earlier.

"At present, as we are now fixed, we can run all the winter, and this means a new lease of life to the yard in knocking out the old system of short seasons and shorter profits."

Samuel L. Patterson, after his respected father, is in for work and business, and will on attaining his majority take upon his

The Borie Bank, Philadelphia, Southeast Corner 3rd and Chestnut St.

shoulders all the responsibilities of the yards. He has a good clay bank, a trim plant and the best kind of feeling existing between himself and his men.

The best paving and stretcher are bringing $9@$14; repress stretcher, $10@14; hard, $6.50@$7.00; salmon, $5.

The accompanying illustration acts as an indicator and verification of what I have often presaged—the survival of the fittest. In this city, where many of the old, conservative men

are engaged in a profession, there still exists a latent desire to maintain things, places and customs a la colonial. In the accompanying cut we have an illustration of the old Carpenters' Hall, erected in 1724. This was the meeting place of the old Continental Congress.

In the other illustration we have the Boria's private bank at the southeast corner of Third and Chestnut streets, a charming piece of quasi colonial work, as shown by the cornices, corbels and dentals, Keystones, broad lintals and heavy-faced montons; with a facade of Philadelphia stretchers and black headers.

Private means or capital, answering to private desires, and as this is the only one of the many now being erected throughout this city, it may be accepted as a dead sure indicator that bricks will enter a new era, and will be a strong rival against any stone you may bring into this city.

Old Carpenter's Hall, Philadelphia, erected in 1724.

LOCKINGTON.

WRITTEN FOR THE CLAY-WORKER.

THE HYGROMETER AND PYROMETER.

NOW FOR THE FIRST burns of a new century and to look back at the experiences and progress of a hundred years. It is ancient history to go back as far as a hundred years, even fifty, but it is possible for some to review the past twenty-five, and see the progress and gains.

True, our grandfathers have left some noble monuments of their industry, but any one loaded to-day with an output in quality, produced by such expense, would find himself in difficulty to unload at a profit.

It is quite possible for us to grow too conservatively, and feel we have nothing further to conquer. True, the machine men have proven equal to all demands made on them. The ever ready inventive ideas of our people have kept us fully abreast of the times, compared with any part of the world in making brick in quantity or in quality.

The very many kilns offered for our uses are numerous and good, all tending to the saving of fuel, time and quality of our output.

But don't let us flatter ourselves that we have yet reached perfection, and have nothing now required but a better market price for our output.

As a rule, we place implicit confidence in our own judgment and experience, and often in some well-tried and proven burner, never venturing from the beaten path and trusting to eyesight—as though eyes never grow dim going over the same old routine day after day and year after year.

All now seem ready to admit highly scientific education most desirable, and that the schools of practical science are destined to fill a long-felt want, but still contend that this is only theory, which must be tempered in the practical yard or factory.

How few ordinary brick works are equipped with anything pertaining to scientific instruments or appliances, leaving such developments in the hands of the large concerns, to develop to perfection, with the good intention of taking them up when the road has been made good, sure and easy.

They are apt to find the large factories developed under just such ways and means that makes it impossible for them to follow up, being unsuited to the requirements of the majority.

While the ordinary, everyday brickmaker could study out his own actual requirements, with the assistance of the instruments now within the means of all to acquire and knowledge to use.

How few have availed themselves of Prof. Orton's cones, and how much can be accomplished by their use and by close observation. Constant firing makes drains on eyesight that will sooner or later deceive you. To burn by weight of fuel and number of hours is to go by rule of thumb.

The difference in clays drying can only be determined by actual results in your own particular clays. You may be forcing them through a temperature and keeping no record of the humidity. The hygrometer gives you all this, but you have not got one. Why?

Now, science has handed you a most desirable instrument, truly scientific, and yet requiring no technical knowledge to use or understand. It is not necessary to wait until your eyes fail to put a pyrometer in your office. Nothing of such a practical nature has been developed for the brickmaker, while no well-appointed terra cotta works or pottery can afford to be without it. Why should not brickmakers be the first to see and feel the necessity of taking the advantage of all these modern improvements of this twentieth century.

"Be not like dumb driven cattle,
Be a hero in the strife."

The pyrometer gives you every degree you raise your heat, and it also can prove its correctness. How often are we firing heavy, wasting fuel and labor, under the impression we are gaining the desired result, while in reality we are at a standstill. We have smothered and choked the very desirable combustion we sought to obtain, and again we are overburning, and don't know it until too late.

Now, with a pyrometer, every degree of heat is registered in the office, away from the kiln, and as many kilns as you desire, and as many parts of each kiln as you wish. Now, this leaves an employer master of his own burning and also of his headstrong, old-fashioned burner. The burning can be governed from the office and not from the imagination of the burner at the kiln. After having become familiar with its uses, you will wonder how you ever got along without it.

This instrument is the development of Mr. W. C. Heraeus, of Hanau, Germany, acting under the Royal Physical Technical Institute at Charlottenburg, according to the principles of Professor Le Chatelier, of Paris. The principle involved in the construction of this instrument is the conversion of heat into an electric current and determining the degree of heat by a suitable device, indicating the electro-motive force of such current. Two wires, one of absolutely pure platinum and the other of the same metal alloyed with 10 per cent. of rhodium, are fused together at one of their ends, in the shape of a ball, and thus form a coupling. This junction of the two wires generates a slight electric current when heated. To prevent injury to the wires from abrasion they are inclosed in porcelain tubes, a small tube, open at both ends, insulating the two wires, and a larger one, inclosed at one end, covering the whole. The galvanometer used in connection with the pyrometer is of the d'Arsonral type, and especially adapted to the measuring of thermo-currents.

The current is transmitted to an armature, wound in quadrangular shape through a fine wire of hard metal which does not

oxidize; a small spring of the same metal acts as a negative. A strong permanent magnet, with iron poles, constitutes a magnetic field. An iron cylinder in the center concentrates the magnetic lines of force.

The pointer moves over two scales, one of which denotes the electro-motive force of the current in microvolts, which makes it possible that the readings of the instruments can be checked, while the second scale gives direct readings of the degrees of temperature. It measures temperatures up to 2920 degrees Fahrenheit. With such instruments in the brickyards we may look forward to more rapid advancement than in the past. They are in the reach of all, and no technical education is required for their use. Science is reaching out its hand to labor to lighten its burden and lead on to success.

M. JAY.

MIDSUMMER MEETING OF THE NATIONAL STOVE LINING MANUFACTURERS' ASSOCIATION.

THE NATIONAL Stove Lining Manufacturers' Association have just had another one of those good times for which it is so noted. It has been the custom heretofore to has a clam bake yearly on the banks of the Taunton river, Massachusetts, on property owned by the Dighton Stove Lining Company, and our genial friend, G. C. Francis, treasurer of that company, has always been very much in evidence on those occasions as director of the bake, but this year business necessities required them to meet in New York, so the members were called together at the Broadway Central Hotel on the 24th inst., and after all trade matter had been settled they adjourned to meet at the New York end of the Brooklyn bridge at 4 p. m. to take the parlor car "Columbia," which had been chartered for the occasion.

The car rounded the curve promptly on time, and passed over to the Brooklyn end, where it was sidetracked for ten minutes to allow of refreshments being taken aboard to keep the gentlemen from suffering while being transported to the Brighton Beach Hotel, Brighton Beach, and after a delightful trip through Brooklyn and the old town of Flatbush, quaint but beautiful, our destination was reached, and at 6 o'clock we sat down to the table to enjoy the repast which Messrs. Roche and King, the proprietors, had so bountifully prepared for us. Not much speaking was done, as we were "all too full for utterance," but at 8:15 p. m. we were shown to seats especially reserved for us on the upper veranda of the hotel, from whence we viewed as fine a display of fireworks as is to be seen anywhere. A list of the pieces you will find on the last page of the menu.

FIRST ANNUAL OUTING, BY THE SEA, OF THE NATIONAL STOVE LINING ASSOCIATION.

Brighton Beach Hotel, Brighton Beach, Friday, Aug. 24, 1900.

Harry A. Perkens, President, Brooklyn, N. Y.
Bartlett C. Peirce, Secretary, Taunton, Mass.
John G. Williams, Treasurer, Taunton, Mass.

* * *

"The atmosphere breathes rest and comfort, and the many chambers seem full of welcome."

* * *

"I hope as no unwelcome guest
At your warm fireside, when the lamps are lighted,
To have my place reserved among the rest
Nor stand as one unsought and uninvited."

* * *

MENU.

Little Neck Clams. Clam Chowder.
Broiled Bluefish, Maitre d'Hotel. Cucumbers.
Roast Tenderloin of Beef. Green Peas.
Roman Punch.
Soft Shell Crabs, Tartare Sauce. Watercress.
Assorted Cakes. Watermelon.
Roquefort Cheese. Coffee. Water Crackers.

Programme of Lloyd's Brighton Beach fireworks displays for Friday, Aug. 24, 1900, commencing at 8:15 p. m.:

—Special Effects, Ocean Front of Brighton Beach Hotel.—

Illumination—Red and green.

Bombshells—Crumpled velvet, purple and gold, rain of silver fire, feathery flakes, flashing diamonds, spider and the flies, tri-colors, rubies, diamonds and pearls, violet blue, harlequins, jasmine, colored prisms, glittering beams.

Rockets—Glossy green, silver serpents, rain of silver darts, greenish white, magnesium brightness, dazzling white fringed with pink, golden pollywogs, blue, pink and emerald, laburnum, wisteria, peacock feathers, beams of sunshine, crowns of gold, Lloyd's new colors.

Fountains—Silver and gold, Chinese sacred crackers, 100 feet long.

Devices—Chinese pagoda, Pekin; gigantic jeweled wheel, tree of jewels, Niagara Falls, grove of golden leaves, monkey acrobat.

After the fireworks we formed in line and marched to the theater, taking possession of the bald-headed row, "the observed of all observers."

After the performance was over we boarded our car, which had been awaiting our orders, and found a bountiful repast awaiting us, which we all partook of and enjoyed as we sped on our way to New York. The turn trip was without incident except that all voted Messrs. Roche and King bricks of the best make in every respect.

All the large stove lining manufacturers were represented, Taunton, Mass., as usual, predominating, having Mr. B. C. Pierce, secretary, and Mr. John G. Williams, the treasurer of the association, as well as others present, Brooklyn coming in second, with Mr. H. A. Perkins, the president. Messrs. Dwight Corwin, Rolly Horn and F. A. Hanly were guests of the association at this meeting.

Only those who take part in occasions such as these reliaze how valuable they are to business men. The meeting of one's competitors away from business cares, the interchange of thought at all such times, especially after a good dinner, when every one is "free from care and from labor free," when the true character of a man comes out and the petty jealousies of life are forgotten, conduces to better business relations than would otherwise exist.

C. A. B.

IN AND ABOUT PITTSBURG.

THE CARNEGIE STEEL CO., Ltd., have just completed several large additions to the Homestead plant. The new additions are mammoth buildings of brick and structural steel.

The Department of Public Safety in this city is experiencing no little trouble with contracts for asphalt pavement which were let to the Empire Asphalt Co. and later canceled.

During the past month permits for brick buildings whose estimated cost will reach $200,000 have been issued in this city. The Iron City Fire Brick Works, one of the old established firms of this city, which makes a specialty of fire brick for rolling mills, blast furnaces and foundries, is doing a big business. This firm has lately booked some large contracts.

Kier Bros., of this city, have just supplied some extensive contracts for fire brick and tile.

The Manown Manufacturing Co. are operating their plant to its full capacity. The company is filling some large orders for fire brick.

The Philipsburg Fire Brick Co., whose large plant is located at Philipsburg, in Center county, Pa., is an extensive shipper to Eastern and Southern points. The product is a very excellent one, being produced from the well-known fire clay bed in the mountains of this State.

Sankey Bros. is one of the well-known Pittsburg firms in the brick business. This old and well-known firm has had its full share of the big orders which have come to Pittsburg brick firms during the past few months, and is just now busy getting out orders which have been booked ahead.

The Kane Brick Co., of Kane, Pa., has been chartered with a capital of $10,000.

AL. LE GHENY.

ONLY ONE DANGER.

"With my arm around you, you should fear nothing," he said.

"Except gossip," she replied, as she quietly disengaged herself.

After all, there are some things that woman understands better than man.—Chicago Post.

WRITTEN FOR THE CLAY-WORKER.

THE TRUSTS AND THE SMALL BRICK FACTORIES.

First Paper.

By L. C. M.

SOME PARTS of our states are many small brick factories, situated often only a few miles apart. Most of them are fairly well equipped for making brick and drain tiles. Many of them have a daily capacity of ten to twenty thousand bricks, and represent an investment of $8,000 to $15,000. Each gives employment to men, ranging from ten to twenty-five, for about eight months during the year. Very few of them attempt to manufacture during the coldest months, but manage to supply their territory by running their machinery about three-fourths of the year. Their employes would not be classified with the ordinary factory hands in large establishments. Nine-tenths of them are permanent residents of the community where they work, and many of them are the sons of farmers and mechanics in the neighborhood, who choose to work for a time at brickmaking rather than follow the vocations of their fathers. They work at the brick factory while it is in operation, and then look up some other employment during the months of idleness at the brickyards. The next season the manufacturer does not secure the same crew entirely that he had the year before, and often but a few of them. But generally enough experienced men return to work that he suffers no inconvenience from the employment of green hands.

Most of these factories make a good class of brick and tiles, and sell them within a radius of fifteen to twenty miles. Their annual output on an average will approximate one to two millions of brick to the factory. And as every thousand of brick requires about $3 in labor to produce it, it will be readily seen that these small factories are of considerable industrial and financial importance to the community where they are located.

During the last five years, competition among these small factories has been very severe on account of hard times reducing the demands for their products. Many of them sold goods below the cost of production, rather than miss sales that seemed necessary to tide them over some financial difficulty. Many of these proprietors were in debt, and had annual obligations to meet outside of the regular expenses of manufacture. So, if Mr. A. had a half million bricks piled upon his yard, he could not afford to lose the confidence of his creditors even if he had to sacrifice all of his stock on hand.

So, when some prospective customer made the rounds of the various factories within his reach, and then started upon a second round trying to force prices to the lowest notch, he found ready victims in the persons of our friend, Mr. A., and others like him, who had to have money or lose their credit. There is no competitor that can equal the one made desperate by constant influx of bills payable.

This sharp practice could not go on without some one failing, and many went down during the last few years, and their plants are advertised for sale, or have been sold to satisfy Satan's great instrument of torture—the mortgage. Those who weathered the storms of adversity realized that something must be done to stop this loss caused by being too eager to sell bricks, and set about formulating some plans to effect their purposes. There seemed but one feasible plan under the circumstances that promised any degree of effectiveness, viz., agreeing upon a uniformity of prices for similar wares in all factories. This is an age of consolidation, and the brick factories were caught right for the prevailing spirit of the times. It looked as though a brick trust would be formed to control prices in quite extensive territories, but for some reason the plans did not materlalize. And now the question comes to the front, Can brick factories withstand the pressure and retain their individuality, while all around them manufacturers of other products are surrendering their properties to the agents of trusts, and allowing the management of the affairs of their companies to fall into the hands of a few individuals? There seems little doubt that the brick factories of the large centers of trade are drifting into the same gulf that has swallowed up so many factories in other lines. They are consolidating their interests and agreeing upon prices. This is the first step, and other steps will readily follow. Soon one set of officers will manage where many now look after matters.

The poorly equipped plants will be shut down, and the better ones will be put in first-class condition, that the cost of production may be reduced to the minimum. And the output will be limited to suit the demand. This seems to be the prospective fate of brick factories in all great centers.

But can these trusts, when once formed, bring sufficient pressure to bear upon the small factories scattered over our states to force them either to sell to the trusts or quit the business?

This is a serious question, and many are interested in its solution.

If they can succeed in forcing them into joining the trusts by severe competition, most of the small factories will be closed as soon as they pass into the hands of their new owners. This would be a calamity to the communities where these small plants are located. For though they might be able to secure all the bricks and tiles they needed of the trusts at the same old prices, or possibly lower for a time, yet the fact that the goods were not produced at home, and the cost of manufacture expended there, would cause serious stagnation of trade in that locality, and throw many men out of employment. These employes who would lose their jobs by the closing of the small plants would be forced to seek other employment. They would naturally attempt to get work at home, and would work for reduced wages at other than brickmaking, rather than leave the homes of their childhood. Serious labor troubles would arise, until a new adjustment of matters was forced upon them, and they sought employment at the great centers, where a laborer ceases to be the man he was in his old home and becomes almost a nameless unit in the great struggling masses of an overcrowded city.

But while I am drawing this picture of Jonah and the whale, or perhaps, an octopus and its victims would be a better figure, these very victims are busy enlarging and refitting their plants and making preparations for the largeest season's work within ten years. The question of prices has somehow solved itself, for the present, at least, and we are getting an advance of ten to twenty per cent. for our goods without any agreement or consolidation. How long this will last, one cannot say, for all are making great efforts to beat all records in amount of production, and if the demand should fall short of our expectations, we may see, within three months' time, the same crazy scramble to sell regardless of cost of production, that we have witnessed so often during the last five years. We hope for good things in 1900. We verily believe that brickmakers will act sensibly for one year at least. Everything we have purchased this year, from ten-penny nails to boilers, has cost us almost double that of former years. Wages were advanced, for our men scarcely eked out an existence during the era of low prices on the necessaries of life. And now, with pork, beef, flour and clothing sailing out of sight, they cannot possibly be held contentedly at work at old wages. And a discontented workman is invariably a poor one. Fuel had advanced fifty per cent. So what can the brickmaker do but raise the prices of brick, in order that he may meet these increased demands upon his bank account, and at the same time keep the wolf from his own door?

We are glad to see now a firmer tone everywhere in regards to the prices of brick and other clay products. It is not the result of an agreement among manufacturers, but a general

awakening among brickmakers as business men, viewing the situation in its proper light, and each man taking hold of the matter in a common-sense way.

This will last as long as the demand keeps within shooting distance of the supply. When the demand begins to lag, then will come a repetition to the ruinous practice of cutting prices in the vain hope that large sales and small profits will make the ledger show the proper figures at the end of the season.

But the brickmaker cannot afford to sell for as small per cent. of profit as does the merchant. If he attempts such a course, he will come to grief. You need not be afraid of getting too wide a margin between your cost of production and your selling price. Nine brickmakers out of ten underestimate the cost of their wares. There are so many questions to be taken into consideration when figuring the cost that not many men get the correct result. While good times last is the time to make your money. During good times the trust principle makes very little progress, for each individual is proud of his individuality, and would scorn to surrender it to any concern wherein he would have to take a back seat.

(To be continued.)

—Couldn't Stand the Upward Flight.—

I MET HIM in the big elevator that runs to the eleventh story office of a well-known firm of contractors. I had met him before in his manufacturing plant, and knew him to be a genial, whole-souled fellow, as well as a keen and up-to-date brick manufacturer. He was the last man in the world to look to for what happened. There were half a dozen others in the car, and as the door swung to and the car started up we were astonished to see him fall upon the elevator boy and guzzle him. The car came to a sudden stop. The elevator boy tried to free himself from the clutch that held him, but it was of no avail. The rest of us were too much paralyzed by the unexpected occurrence, for the moment, to interfere. But the elevator boy got his breath and in withering tones said to the brickman: "Augh! You —— —— jay! Le'go!" And he let go. Afterwards he told me that elevators always effected him so.

* * *

—Got His Price.—

He was lately over from the Green Isle, and his kinsfolk were fixing him a place in the brickyard where they were employed. He could speak little English, and understood less. Said his friends to him: "We have spoken of you to the boss, and he says you are the sort of man he wants. Now, when he asks you in the morning how much wages you will want, tell him you won't work short of $26 a month. He was a magnificent type of robust young manhood, just the make of a man who would make an expert brickmaker at a rapid rate. This his would-be employer saw at a glance, and he made him a better offer than he had made to any green hand before. "I'll give you $30 a month from now until fall," said the boss. "I'll not take it," was the startling response. "I won't work short of $26 a month." The boss recovered after a struggle, and the man went to work. He made a good man, too.

* * *

—The Pace That Kills.—

"Faugh," said Michael Hickey, as he stood looking into the tread at Bill Morrell's brickyard, where a strapping big Yankee was slinging mud and sweating like a bull. "Faugh!" said Hickey, "the things yez Yankees calls work an Irishman 'd call play. Ould as I am, and I'm forty past, I cud tind two masheens like that and loaf half the time." " 'Spose you could do better than that man is doing?" asked Morrell. "Do I sippose?" said Michael. "I do not sippose, I knyow I cud jist fill that boocket and do an odd job betwixt whiles at wheeling and throwing till they got all me mud out." Haw! Haw! ' chorused the crew and Michael got mad. "I never saw the two Yankees cud do me work. Mr. Moddell, ef yez give me two dollars I'll show yez how to throw that pit in clay through a masheen." "All right; it's a trade," said Mr. Morrell. "Come out of here," said Hickey to the tread tender and he grabbed the shovel with many vain boasts of what he was to show the Yankees. "Watch me tind this thread. Ye'll see how I keep me shovel wet and me powdher dhry like Rory of the hills. It's me that'll make mud and keep wather lugged to fill the strikers' wather box. I'll show ye Yankees what an Irish shoveller kin do. Take away yer mud!" A half hour of breezy chatter and lively work was followed by a season of subdued conversation and earnest shovelling in the tread. An hour of dead silence and shoveling followed. Then there broke from the depths of the tread a hollow moan. It sounded like the voice of a strong man in his agony. It said, "Wather! wather! Mr. Moddell! wather! Wather to wet me shovel! Mr. Moddell! Wather!" The water was forthcoming and again a silent struggle went on for half an hour. Then the mud failed to fill the molds. The machine was empty, and an investigation showed that Hickey had disappeared. Whither had he gone none could say, but the mystery was cleared up later when Hickey was found in a clump of bushes drawing his stockings on over a pair of muddy feet and swearing that nobody "but a Yankee, a nagur or a Mihomadhaun would make a slave of himself fer two dollars." "Faugh," said Hickey.

* * *

—An Unnatural Epidermis.—

Since making my threat to tell more of the man who never sweats, the story has come to me from an authentic source of a prisoner sentenced to a term at hard labor. The prisoner was a refined looking man and before he was put to his work he told his keeper that he could never sweat; that on that account he suffered intolerably from heat, and that exertion in hot weather was dangerous to him. He said that a physician had once advised him that his skin was unnaturally formed, so that he could not sweat, and that unless he was careful he would die suddenly of heat. It sounded like the subterfuge of a lazy man to avoid hard work, and to punish him for thus attempting to fool his keepers the prisoner was placed at the hardest work in the hottest place in the prison and driven to his utmost every minute by his keeper. Suddenly the man threw up his arms and fell upon his face. He was whipped to make him rise. Failing to make him rise, they picked him up. He was a corpse. His heart had given way. But Bill Morrell was not of that man's make-up in any manner or particular. Morrell worked and seemed to glory in work and heat, but he never sweat, and he never was a day sick that I know of, and his humor was ever as crisp and cool as an ice cream soda. I never saw him hot. They say when he got angry he went off and kicked himself.

* * *

—A Brickyard "Tender Foot."—

He was a tall, lank gentleman, with a forest of whiskers lit up by a shining proboscis suggestive of a beet. He wore boots modeled after the youthful fancy's picture of the seven-league boots. He wanted to buy bricks to build his chimney higher and he had never before been in close connection with a brickyard. He viewed the broad expanse of yard awhile and then asked a wheeler, "When are they going to begin cutting 'em out?" The wheeler comprehended his mistake and answered, "Oh, pretty soon now." "What sort of cutter do they use to cut 'em out with?" he asked. The wheeler showed him half a dozen battered pick-axes. "What?" he said. "You don't mean to say they cut 'em out with them things, do you? "That's what they dig 'em out with," said the wheeler. "Wall, I swear," muttered the visitor, "I allus 'sposed they had some sort o' rig like a cake cutter. Brickmakers must be smart fellers, shorely." Then he inquired for the boss, and the man pointed out a man at the opposite end of the yard, but cautioned him against walking across the yard with his boots on. The boss was startled a few minutes later when he was confronted by the man of whiskers and the red nose, barefooted, walking gingerly, as if afraid of cracking the crust of the yard, and carrying his boots in his hands. After a long discourse a sale of 240 chimney brick was effected and the purchaser got into his boots and departed with the air of a man who had seen the biggest elephant on earth.

THE DREAMER.

WRITTEN FOR THE CLAY-WORKER.

? ? ? ? ? ?

"SCIENCE, some one has said, "is what we know to-day." The inference is that it may be different to-morrow. We do not like the definition. It makes science appear too changeable. The word means knowledge, and knowledge must have reference to facts and not to theories we imagine are based upon them. Facts never change, while theories are in constant evolution, until they come into harmony with all truth. To know is to be in a manner like Him "who knoweth all things," and the fruition of all hope, is said to be "to know even as we are known. Science enters the laboratory of the chemist, but that is not her home. She can no more be confined to its narrow limits than the Creator to the temples we have built for His praise. She walks in His footsteps. Where He leads she may reverently follow. The hand-maid of the Creator, she teaches his ways to men. If she has revealed to you any truth, tell it to others, but not as though it were your own conceit, for it is not, nor as one "having authority." And if you really believe that others are in error, say so with all gentleness and loving charity, for, indeed, we are as "children picking up pebbles on the sea-shore while the great ocean of truth lies before us."

Kindly asking your thoughtful consideration of what we shall write, we will call in question a statement that has been made, we believe, by every chemist who has written upon the nature of clay. It is this, "When the combined water has been driven off by heat the clay has forever lost its plastic character." This water is called by scientific writers a number of names, as "hydroscopic," "combined," "water of crystallization," "water of constitution," etc. We submit that for the sake of definiteness and to avoid misunderstanding, that some of these names should be dropped. Why use the word "hydroscopic" when the two Greek words from which the word is formed mean water and viewing? And this combined water is the water that cannot be seen. Why use the word crystallization when the water does not crystallize? As to the word "constitution," its appropriateness depends on whether it is a constituent part of the clay. We much prefer the word "combined," for its meaning has come to be understood by clayworkers.

Prof. Orton says, in Clay-Worker March, 1894: "It is not like the water used for tempering; it is a real constituent part of the clay, * * * and when it is driven out by the heat "the clay becomes lighter by this amount, and, moreover, the plasticity of the clay has been forever ruined. Nothing can bring back plasticity to a clay which has once passed this critical point." At what temperature does this critical point occur? In the Ohio convention reports of 1891 may be found this passage:

W. D. Richardson—I would like to know at what temperature the water of crystallization begins to leave the brick.

Prof. Elsom—After the brick have been subjected to 212 degrees Fah. twelve hours the combined water is all gone. Our rule is to slowly remove the extraneous water until at a degree of 212 degrees Fah., when the water of crystallization begins to move.

The reader will notice that that which Prof. Elsom calls the "extraneous water" and the "combined water" is the same as that which Prof. Orton calls the "water used for tempering," or "free water," or "hydroscopic water," and that which Prof. Orton calls the "combined water" is the same as Prof. Elsom's "water of crystallization." We don't care what they call them so that we know what they are talking about. When one begins to go out at the exact temperature the other has evaporated, and we have no way of putting a tag on them, it is pretty hard to distinguish between the two. We, however, like Prof. Orton's terms, "free water," "the water used in tempering" and "combined water, that which is a constituent part of the clay."

Prof. Elsom says the water of crystallization begins to go out at 212 degrees. We think it should if it is real water, but Prof. Orton said, in third session of Ohio convention, that "at 550 degrees the water begins to go out and at 700 degrees C, or about 1200 degrees F., the last of the water, or 85 per cent. of the water, will have been expelled, and the temperature will be a red heat which can be seen in daylight, but not a bright or cherry red."

The Professor gives an account of an interesting trial which seems to confirm his statement, and says: "It has been shown by scientists a long time ago that the combined water is expelled from a clay only at a temperature just approaching redness, or above."

This is so at variance with all that we know of the action of water under heat that we are led to ask if the reduction of weight in the clay may not be owing to the volatilization of some other constituent part? Something besides water must have gone, for we cannot consider water as the cause of its plasticity. Is there any other instance in nature where water is so confined?

We question the statement that at a red heat the clay has wholly lost its plasticity, and will tell you why. Has not a salmon brick been red hot? If you leave one on the ground through the winter it will be a plastic mass before the summer comes. We were at a brickmaker's house, and in conversation he made the statement that clay lost its plasticity at a red heat. We asked him if his salmon brick had been at a red heat. "Why, certainly," he replied. "Well, we can take your salmon brick, run them through a dry-pan, screens, pug mill and your brick machine—an auger machine—and make them into brick again." "Do you think so?" "Certainly, I do." He went to his brick kiln and brought back a salmon brick, broke, crushed and ground in water, a part of it between the face of a hammer and an iron plate. It became plastic; not so much so as in its original state, but sufficiently so to roll into a ball, which when dry was strong and very hard. You brickmakers can try your own brick. All clays would not, of course, work the same. Possibly the calcareous clays may show less plasticity under the same heat than clays that will make a vitrified body. Take your science with you to the brickyard and demonstrate your theories on a large scale, if possible. If in a few minutes, by rude mechanical devices, we can do this with a salmon brick, we are disposed to believe that nature can, in course of time, with her tireless energy and subtle processes, do the same with a brick that has been subjected to a much higher degree of heat. To hold otherwise would be to deny another lesson in our natural philosophy. It is considered a well-established law that matter cannot be destroyed; that in all the combustion and decay, which is slow combustion, there is not an atom lost; that there is not a single element that enters into the form of any composite body that nature may not separate it therefrom and combine it with other forms, that it may enter into a thousand forms of the mineral, vegetable and animal kingdom. No combination can forever retain it; no disintegration can injure it so that nature can not use it again, and no combustion destroy. But if you have so changed its nature that it cannot be restored to its original character, have you not destroyed it? It is said that "in the aggregate of matter nothing can be added thereto or taken therefrom."

We would not presume to say that a well-burned common brick, no, not even a vitrified brick, could not be turned to clay again by the processes of nature. Is this not just what nature has already done? Do not all scientists say that our clays are derived from the decomposition of feldspathic granitic, igneous rocks, and that this world was at one time a mass of incandescent matter? How graphically Orton speaks of this in Clay-Worker, January, 1897:

"And when we see the fierce heat generated in a converter by the union of a few hundred pounds of silicon and oxygen, and that every grain of sand on our seashores, and every crystal of quartz in our mountains has given up its quota of heat, when its silicon and its oxygen first combined, our imagination shrinks back appalled at the immensity of the temperature which must have presided at the nativity of our planet."

Who will show the harmony between the two sciences?

I. QUESTION.

Awarded a Gold Medal.

The Jeffrey Manufacturing Company of Columbus, O., was awarded a gold medal at the Paris Exposition, covering its line of elevating, conveying and mining machinery. No doubt many of our readers who have enjoyed a visit abroad this summer have had the pleasure of seeing the exhibit of this company.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Way Down in Maine.

Editor Clay-Worker:

By the time this letter (or such portions of it as the editor of the Clay-Worker may see fit to publish) gets before the eyes of the reader of The Clay-Worker the brick manufacturing season in Maine will be drawing to a close. Take it all in all it has been a good season, better than the average, but not as good as the best. August weather has been good and the demand for bricks has been steady, but in no wise threatening a boom. To the writer it seems that as the years go by and the brick-for-export yards give way to the brick-for-home-consumption yards, the risk of loss becomes less. The manufacturers seem to gather a better idea of what the future holds and are not so apt to wallow in over their heads. What New England brickmakers need is a campaign of education inaugurated to teach the public the advantages of brick in building, roofing, paving and general public uses. More brick paving should be the rule, and it will be the rule when the public learns its advantages. As lumber more and more disappears into pulp, brick as a building material must come forward. In the clay banks of Maine at least lies the hopes of future Maine industry, when the pulp mills have finished the job they certainly must accomplish, by eating up the Maine lumber supply. This is given as a tip. Suggestions to meet the conditions are in order. B. J. D.

Buffalo Brick and Building News.

Editor Clay-Worker:

Prospects for brickmakers in this market have brightened a good deal in the past two weeks. Everything points to a good fall trade. Our twenty-five-million-dollar steel plant just located out at South Buffalo, near Stony Point, has had a large force of men at work clearing up the land, and are now ready to commence building. I am told their office building will take nearly a million of brick, and the first one of the shops on which work will soon start will take over that amount.

The Albright Art Gallery and the New York State Building will each take over one million brick. Stewart Bros. are going to build an eight-story block on Main street, and on East Chippewa they are tearing down brick buildings to replace them with larger ones.

The work on the new $1,000,000 hotel on the site of the old French church, corner Clinton and Washington streets, is moving slowly along. The retaining walls are about half done. The style is something new in this city. They are built of concrete, 5 feet at the base and 20 inches at the top, on level with the street. They put plank sheeting on each side of the wall, and the concrete, of crushed stone and cement, is put on barrows and dumped in, and then well tamped down with pounders. After hardening it looks quite substantial, and I was told by a stone mason it will answer just as well. It is the first wall of the kind I ever knew being built in this city.

Buffalo is noted for the quality, size and cheapness of the stone quarried, out at Zamerthal. Some of the finest dimension stone is daily shipped from these quarries. To make the boys still happier word has reached them that the Pan-American will need between five and six millions of brick for sidewalks and other purposes.

The lower strata of clay at the Lancaster Brick Co.'s yard burns an almost white color, and the idea was to line the edge of the walk with a white brick and also to make a sort of checker board walk of them, but the secretary of the brick company informs me the season is so far gone they will be unable to make them before cold weather sets in. Too bad, for it would give the walk a very unique appearance and in unison with the white buildings.

Right here let me remark the Pan-American is progressing as rapidly as could be expected. The large buildings are rapidly approaching completion. A small army of men has been at work for months preparing the white staff for the outside finish. The more expert model the figures, cornices, moldings, and many of them are fine specimens of high art. Owing to the fact that it was thought the risk from fire was too great when the public was running all over the buildings and grounds, the director general has issued an order closing the grounds to the public. A pass for visitors can be obtained by application to the proper authorities.

The electrical tower is growing upward every day—built of steel, to be 350 feet high, with a restaurant 70 feet from the ground, and promenade floors at various heights. From near the summit, on a clear day, a grand view of Niagara Falls and the surrounding country can be seen. A feature of the tower will be an electrically illuminated waterfall 75 feet high and 35 feet wide. It will rival the famous Eiffel tower. The power-house, in which the electrical energy of the Niagara Falls Power Co. will be stored and used, has been roofed in, and the building is nearly finished.

On the Midway some of the buildings are already up. One of them, entitled, "A Trip to the Moon," on the airship Luna—said to be full of thrilling interest to all who get on board. Also a large buliding for darkness and daylight. Among other large concessions is the Streets of Mexico. It will contain a theater, market stores, and every feature will reproduce Mexican life. The aerio-cycle resembles the walking beam of an engine; at each end of the beam is a revolving wheel, in which four cars are hung similar to the Ferris wheel; when one wheel is down taking on passengers the other end will be up in the air about 275 feet, so you can see all around you. House upside down, Hawaiian volcano and theater, Venice in America, old plantation, the beautiful Orient, Japanese tea garden, Filipino village, and countless other attractions, many of them taxing the ingenuity of man, to devise means to please the fancy and attract the public.

The Jewettville Pressed Brick Company, located about sixteen miles from this city, on the Rochester & Pittsburg Railroad, owned by Brush & Schmidt, are very busy filling orders for red pressed and flashed brick. They have one four-mold dry press and a Centennial stiff clay machine, on which they make a nice dark red brick with a flashed face. They are being shipped in all directions, as far east as Boston, and south to Baltimore. They really lack capacity to fill orders.

Mr. Geisen, of the Frontier Brick Works, at Niagara Falls, was in town to-day making some collections. He reports having sold about three millions, and expects to make four million this season.

M. J. McCusker & Son, of Jamestown, N. Y., are quite busy. They have had a very good season so far, and are filling some nice orders from Oil City and Titusville, Pa. They had completed a large filling at the Elks' clam bake, held in their city on the 7th inst. J. E. M. is an Elk as well as a brickmaker, and always has the latchstring out for any brickmaker who comes to his city.

A. & J. McMurray, of Olean, N. Y., have a good yard and are doing well. They have a gas engine forty-horse power, and say it costs about 46 cents per day to run it. Olean is a clean city, with brick pavements extending in all directions.

Buffalo, Sept. 11, 1900. NORTON.

The Chicago Brick and Building Situation.

Editor Clay-Worker:

The industrial condition of Chicago is of a decided mercurial quality. A noted improvement in all lines of material was the record for July and the first half of August, but too much prosperity means less of trades unions, and this fact is recognized by the labor agitators, and since the Labor Day parade, participated in by less than half the number expected, extra exertions are put forth to head off fall trade, and with every prospect of success. During the past month lukewarm trades unionists, having in mind their personal interests rather than that of the unions, have accepted work wherever it was offered, and by so doing weakened the cause (?) and strengthened the position of the contractors. This condition spurred the officials of the Building Trades Council to renewed efforts, and the 4th inst. inaugurated the first step toward complete stagnation, provided the contractors and manufacturers do not submit to the demands. The wood-workers' union opened the ball by calling a general strike, and as all interior finish and

mill work is represented in this body, it means something serious. One of their demands is that the manufacturer shall refuse to deliver material to contractors who are considered unfriendly to organized labor. At a meeting on the 4th inst. of the mill men the question of migrating to Michigan was discussed, and the statement was made that certain cities had not only offered a bonus to manufacturers, but had guaranteed immunity from all disturbances likely to be created by organized labor. This hardly jibes with the condition reported at Detroit in the construction of the county court house, a $2,000,000 job, and of course Chicago is represented by two firms having a good share of the work. Some question arose as to the goods being "straight," and at the demands of the Detroit Building Trades Council, a commission was appointed to investigate, as all contracts for the work stipulate that all labor and material must be of the union brand. The commission reached Chicago August 24, and consisted of the county auditor, two aldermen, the superintendent of the court house and the chairman of the board of supervisors; it may be only a coincidence, but the names of the lot would not have caused comment in the steerage list of an emigrant steamer. I can also add that the furnishings of this interesting building must not only be union-made, but made by labor affiliated with a central body. Our Chicago manufacturers had better let well enough alone, and not jump from the frying pan into the fire. The growth of Chicago is attested by the fact that our school facilities are grossly inadequate to our needs, and in spite of the fact that some half dozen school buildings started this fall, and it is to be hoped that the present generation of school children may secure some benefits from them. Speaking of schools, our school janitors have effected an organization and will affiliate with the American Federation of Labor. If the school janitor has the same kingly control as has his brother of apartment house fame, his future is assured. There is one Chicago man for whom the trades union has no terrors. He secures vacant property, puts in all improvements, then builds and sells, and makes a success of it. Mr. S. E. Gross has done more for Chicago in developing the suburbs than any other man in its history. His last deal is his Alta Vista Terrace property, north of Lincoln Park. He has let contracts for the erection of forty residences, thirty-six of which are two-story and basement, and press brick fronts, and four, three-story and basement and stone fronts. This is a pointer as to what we would have were conditions favorable for a universal revival of the building interests. Our Federal building is a bone of contention between the unions and the contracts. and should the work be pushed, as it must be, after election, its odds in favor of the unions as to who does the work. That Chicago's labor trouble will keep to the front is admitted by Vice Chairman Payne, of the Republican committee, in a recent interview. He said: Illinois is all right outside of Chicago. But the labor fight has been so long that I don't think any living soul can predict what effect the trouble between the contractors and the workingmen is going to have in Chicago on the national election."

My letter is a few days earlier this month, owing to a much anticipated fishing trip calling me from Chicago, but whatever the results of said trip may be. I will not allow myself to be swerved one iota from the facts, and I trust that my early training, together with a habit of adhering strictly to the truth, will be to me as the sheet anchor to the drifting bark, besides I've read Gates's shark story. VERITAS.

Chicago, Sept. 11, 1900.

DOWN IN JERSEY.

Editor Clay-Worker:

The mention I made in my previous letter of the brick paving of Fayette street, Perth Amboy, brings to mind the fact that the job has been completed by the contractor, and from a local paper I note the work has been done in a satisfactory manner. As this is the first block of vitrified brick paving on a residence street and, in fact, on any street, in Perth Amboy, it is worthy of particular mention. And now New Brunswick avenue, in the same city, is to be paved also with brick. This avenue being the principal avenue of escape used in ye ancient days, when 'tis said George Washington chased the British off this portion of New Jersey soil, and also now the principal driveway for those desiring to visit the northern and western part of the county, the laying of vitrified brick will be one of the greatest improvements of the 200-year-old city on the Raritan.

For years the writer has said this day would come, and the macadam would fail to give satisfaction in the streets of a populous city. Now that the ball has started to roll we expect to see many streets paved with vitrified brick.

We ought to make these brick at home from the vast deposits of red shale and clay found in this county, but we believe the brick used on Fayette street comes from some Eastern concern.

We continue our inspection of the Highland Park Hill pavement at New Brunswick, N. J. A trip over it last week shows a continued wear that is out of all proportion to those of good brick. One more block of brick pavement is being layed in New Brunswick. This also is on a hillside street. So you see the wedge has started, and no doubt will go clear up to the head.

The buildings spoken of in one of my former letters as being erected by Harris & Campbell are progressing fairly well. But as they shipped stone into the city for foundations (something unusual for this section), the consumption of brick will not be so heavy as at first anticipated. We notice this morning, though, that several of these buildings were being built of brick upon the stone foundation.

The knee pants factory, on New Brunswick avenue and Central Railroad of New Jersey, is progressing finely. This will be a three-story building, so 'tis said. This same firm is starting a number of dwellings for their employes on the western end of Fayette street, using many brick for foundation. Red brick, I am informed, are only bringing $3.50 at the yards at South river, a very low price. Freight and cartage would make the price about $5 at the buildings. Query: Why are there so many frame houses built when brick are so cheap?

All the factories are running as usual and shipping a great deal of stuff. The Standard Terra Cotta Co., of Perth Amboy, has been sold by Receiver George Harvey to a New York party, and will start up again shortly.

We notice at Woodbridge a new switch has been laid from the Port Reading railroad for about one mile along the different clay banks, ending first across Main street. This will be a great convenience to the various miners, as heretofore teams were necessary to haul to a switch along the main line.

There have been millions of tons of clay taken from this, the richest deposit of clay possibly in the world, and every pound has been taken away in wagons. It is simply astounding to look at the vast holes and mountains of stripings in this region where clay of incalculable value has been mined, and there are other millions to be taken out yet.

Our neighbor, Mr. Chas. S. Edgar, "The Clay King," with Mrs. Edgar, have been in Europe for the past four weeks, taking in the exposition and seeing other sights. Speaking of Charles Edgar, reminds us of meeting his brother Milton and George H. Tice, now postmaster of Perth Amboy, but formerly associated with Mr. Milton Edgar as salesman. The pair were in a carriage, apparently on their way to the county seat, and after giving a passing greeting it struck me that there must be politics in the air this morning, for what these worthy gentlemen can't see in the latter line of business, as well as in the clay business, is not worth seeing.

I should not wonder but what they are after Uncle Sam to build a government building in Perth Amboy, as well as in New Brunswick. An appropriation has already been made for the latter place. And, as Perth is a port of entry, and our Uncle has to pay rent for custom house offices, as well as post-office, it seems more fitting that the latter town (I mean city) should have the first pull, but Perth is getting there with both feet, and many things are coming her way now that probably will in the next five years place New Brunswick in the van instead of the lead as far as population is concerned. As for monthly pay rolls, Amboy is already thousands ahead

The Atlantic Terra Cotta Works, ot Tottenville, just across the sound from Perth Amboy, has a fine run of work, with about 350 employes on the pay roll. Pretty good for a three-year-old.

Tottenville is in the Greater New York, but on the extreme southern end of Staten Island.

This city, or part of the greater city, is to have a new smelting and refining works, known as the Nassau Smelting and Refining Works. This company have already broken ground just north of the Atlantic Terra Cotta Works, and will doubtless consume many common and fire brick in the erection of their works.

In our letter describing the probable fault of Mr. Crane's tank we notice you make us say "the pressure of the brick" where it should have been the pressure of the water.

We should like to hear from our friend Crane just how he did build this tank.

We wish to say that during the past week we had an inquiry from a county in Missouri regarding the drilling of a deep hole. From my sightseeing in Missouri last season I had an idea that outside of the cities very few copies of your journal would

be found, but as The Clay-Worker was named, it certainly creeps into all manner of places.

Our own little town, Metuchen, is without a single new building going up as yet this year. But when the trolley line is built from Perth Amboy we anticipate an increase in residents from that source.

We have a fine, beautiful town, with a good supply of the best water in the State, electric lights, three railroads, and over 200 trains per day on the Pennsylvania railroad alone; 26 miles from New York City, six miles to each of the following places: Perth Amboy, New Brunswick and Plainfield. The latter city is without doubt the most beautiful town in New Jersey. When the trolley line is completed from Perth to Plainfield we can then go from Perth to New York via trolley. Besides all these conveniences, we have a system of macadam roads extending over this county and adjoining counties that are hard to beat, and what a contrast with the old mud roads of only five years ago. When these same roads are laid with vitrified brick, which will come around within the next twenty years. this indeed will be a paradise. A short link is now being built of macadam that will make a solid stone road from New York City to the City of Brotherly Love. The trolley lines only lack a few miles now of being a continuous line from New York to Philadelphia.

If any of your real rich brickmakers desire to enter into the brick business in this section and desire reports upon clay deposits just refer them to your correspondent. I have drilled through more clay in one spot than a generation or two of brickmakers could use. We should have a paving brick plant here. for there surely will be no more macadam or stone pavements in these Jersey towns. W. R. O.

Metuchen, N. J.

FROM THE KENTUCKY METROPOLIS.

THE OUTLOOK CONTINUES bright here, and brickmakers are as busy as bees, for this is the season for turning the extra work with which to stock up.

The Hydraulic Brick Company, St. Louis and Twelfth streets, which has a capacity of 80,000 a day in the one line of their special face brick, is busy on a large contract for the American Tobacco Company, which is putting up a building, the walls of which are to be faced inside as well as out. This contract is for a large warehouse, and calls for 1,200,000 brick. The clay beds of this plant are some six or seven miles from the city, on the Preston street road, but a trip to the plant brought to light an immense stock of dry clay which they have on hand now at the plant. They are using the St. Louis hydraulic press, have a kiln capacity of 250,000, and figure on three weeks' time between the clay bank and the take out. It must not be inferred, either, that the business of this concern is entirely local, for in addition to their trade here they supply a number of tributary towns, including Nashville, Tenn.; Bowling Green, Ky., the famous bluegrass region, and any number of points, at many of which they carry a very heavy stock.

Owen Tyler is feeling all right about business, and reports some pretty good contracts of recent date.

L. R. Figg reports some nice granitoid contracts, and says that the outlook for business continues fair.

This is one of the greatest cement points on earth, even if one of the cement industries here was reported to be in financial straits recently, and some day I am going to get a divorce from the brick end of the business long enough to tell you something about the curious features of this cement industry.

—A Lady Brick Dealer.—

The ladies of eKntucky have been famous the world over for their rare beauty ever so long, and we natives here not only sing their praises when we are away, but we do homage to them here, and now I know that you will be pleased and will conscider the business as particularly honored, because I am going to tell you that we have a Kentucky lady in the race of brick dealers here. A peculiar feature about it, too, is the fact that her name sounds familiar to the industry, for it is Clay, Miss Hattie A. Clay, and when her attention was called to this similarity in the name she smiled and remarked that some of her friends frequently jokingly called her "Miss Mud." Miss Clay, who, by the way, is a grandniece of our great Henry Clay, has been dealing in brick as a side line to her stenographic work for six years, having taken up the work six years ago at the earnest solicitation of Mr. Ittner, of St. Louis, Mo., whose agent here at that time ran away, or got away by some other means.

In addition to handling the pressed and ornamental brick of Mr. Ittner's plant Miss Clay handles the terra cotta of Evans & Howard, of St. Louis, as well as acting as agent for the McDonald Brick Works, of Lockland, Ky., and other brick works about the State who desire a local representative. She reports the outlook for fall and winter business as good, with several large buildings promised in the near future, and has a contract on hand now for 1,000,000 common brick to go to the Frankfort Chair Company for repairs to the penitentiary, as well as some other contracts for common brick.

CAPITAL BRICK AND BUILDING NEWS.

THE AMOUNT of business energy in Washington were in proportion to the strength of solar heat that makes things sizzle here in summer, we would have the boomiest boom in this particular that ever boomed; all brickmakers would be multimillionaires, and the District of Columbia's bounds would be the house-filled bounds of the Capital City, and it is probable the streets would extend far into Maryland and Virginia. The output of brick has been a little slow for the past two months, owing to rush of manufactures during spring and early summer, and to the fact that many important contracts have now been filled. Cooler weather will bring more energy, more brick, more money. In the matter of contracts for brick, quite a stir has been made here concerning the award of contract for a large number for the new Government Printing Office. The requirements were for about 5,000,000 common brick, several million selected handmade reds, 100,000 handmade pressed, and about 60,000 molded. The contract went to the Frederick Brick Company of Frederick, Md., a proceeding considered by the Standard Brick Company of Washington as being rather arbitrary, from the fact, according to Mr. Theodore L. Holbrook, president of the Standard company, that the bids of this company on common, handmade red and pressed brick were ignored. Mr. Holbrook stated that his company was the only bidder for select, handmade red face brick and handmade pressed, and that no other such samples were submitted. His bid on 5,000,000 common brick was at $8.73 per 1,000. The only other bids received were for 4,000,000 brick of Washington size, at $8.85 per 1,000, and for 100,000 Maryland size at something more than $8 per 1,000. The Washington standard size brick is one-seventh larger than that of New York, Philadelphia or Baltimore.

Upon the face of things, the Standard Brick Company does not seem to have been treated fairly in this matter of contract award. The Government is under as much obligation to deal fairly and squarely as its least important citizen. The two important items set forth in advertisements for bids should be, and usually are, "lowest bidder and best material." Mr. Holbrook protested to Col. John M. Wilson, chief of engineers, against the award of the contract in question. But, of course, no one has anything to say in opposition to the Frederick Brick Company.

Business in the building line has been moving along, being conducted without much abatement, by both the Government and citizen. In various parts of the city the private residence, new and many nearing completion, is in evidence, and a number of edifices—apartment houses, principally—are making good progress. The new Willard's Hotel is in process of erection, and, when finished, will be a magnificent hostelry, costing about $3,000,000.

The new building will contain about everything to be desired in a modern hotel, but it may never possess historic associations equal to the old structure, just torn down to make room for the modern public palace. The old house was built nearly one hundred years ago, and much of its material was brought from England, mainly the foundation bricks. All the famous legislators who represented their country at Washington have discussed affairs of state in its lobby or rooms, and all the Presidents, from Madison to Cleveland, took rooms there when coming to the capital to be inaugurated into the highest office in the land, or any other land. When General Lafayette came to America on his memorable visit he was magnificently entertained at the old hotel. It was a favorite resort for General Grant, who seemed to like it better than the White House, and who walked about the lobby smoking good cigars, as though he were a boarder there instead of just an evening visitor enjoying the outing among "every-day" people. But the old hotel is now gone, and what will the writers, a hundred years hence, say of the new one?

Well, I don't suppose I will say it, anyhow, for I haven't found the elixir of life, nor yet the fountain sought in vain by Ponce de Leon.

The living problem (to exist in moderate comfort) is always one of deep concern, and seemingly not less easily solved by the Government clerk, "who has it solved for him," than by other hard-working mortals. But the G. C. in Washington has lately been making an effort in this direction, which, perhaps, is worthy of emulation in other places, and which may incidentally help the brickmaker and builder. Heretofore, the aforesaid public servant, when he desired a lot upon which to build a home, must needs purchase from the real estate man who had bought a farm cheap and divided it up after the 50x150 feet process, providing the clerk wished a home amidst rural delights. But now the thrifty employe proposes to chip in with a number of his fellows, buy the "farm" at wholesale rates and divide it up, giving each man his share of land according to his "chip." If all the clerks in Washington were to make such a landed combination they would own a considerable part of the District of Columbia, if the whole purchase were made here, for there are employed in this city something like 25,000 Government workers. Of course, many of these own their homes, many are yet too young to think of purchasing land for such, and many more may some happy day have homes bought for them. But think what a huge affair it would be if all of them were to take seriously to this farm-buying notion.

The stranger visiting Washington just now, and finding himself at the east front of the Capitol, wonders whether all the "insides" are being torn out of that incomparable edifice. From the huge columned portico there extends out over the steps a great framework of timber; between uprights an elevator runs up and down, carrying streetward broken plastering, gilded stucco and brickbats, while bricks are being hoisted to the level of the portico door and wheeled through the rotunda of the former quarters of the Congressional Library. The commotion means that Congress decided to use this unoccupied space for additional committee rooms for Senate and House, and work is being rapidly pushed to get them ready for use by the time the National Legislature meets. The amount of space to be thus utilized will make twenty-eight large rooms, arranged upon two floors, the lower of these opening almost directly into the rotunda. When finished each room will contain a number of electric lamps, will be elegantly furnished, and an electrically-operated elevator will take the lawmaker from the lower floor or basement of the building, to the top floor of these new places of national deliberation. The whole cost of these improvements will be about $150,000.

To look at the Capitol, without knowing anything of its structural quality, one would naturally think the great white edifice innocent of such "common material" as brick. But there is plenty of baked clay in its magnificent makeup, and much of the clay was worked and burnt near the site of the building. As an evidence of the presence of these brick, one has but to view the inner walls of the old library quarters, spoken of above. They are there in all their honest strength and incalculable endurance. Outside, the old sandstone portion of the edifice must have a fresh coat of white paint, as soon as the last application begins to lose its presentative virtue; otherwise the stone would yield to atmospheric action and the National Capitol thus crumble. But the brick will be there as long as the American eagle's tail feathers stay in.

A new book, giving some history of Washington, but dealing principally with the Capitol, is to be printed at Government expense, and perhaps may be out in time for the coming centennial celebration in this city. The main subject of the work—the splendid architectural pile—is indeed worthy of such consideration, by itself, apart from its national character and patriotic associations. Every one does not know that there are about 400 people employed in and around this building all the time except Sundays and holidays; that business there is conducted on a very large scale, requiring post-offices, telegraph instruments, telephones (over 170 of the latter), scores of typewriting machines; also graphophones and various duplicating machines. Millions of speeches and documents are sent from here while Congressmen are away attending to other matters, and the workers in the many rooms are kept comfortable by cool air that is driven all through the building by powerful engines that throb far below in the underbasements. Down there are also many electric engines that run elevators and furnish current for hundreds of globes, situated in every nook and corner of the place. And there are fine baths and barbershops and other luxuries for those who make our laws.

Yes, the Capitol is a wonderful place!

In regard to building matters generally, there has been, according to the district building inspector's report for the fiscal year ending June 30, an increase over the preceeding year's work. The amount of money represented in the latter's operations was something under $5,500,000; former, over $6,700,000. The present year will probably pan out much better than its predecessor. NICODEMUS.

Written for The Clay-Worker.

THE MANUFACTURE OF BRICK IN ROUMANIA.

By C. E. Carpenter.

ROUMANIA HAS THUS FAR attracted too little attention in the United States as a market for American made goods. Few manufacturers seem to be aware of the possibilities for business in the wheat-growing countries of the Balkans, which possesses so few manufacturing industries, and which is consequently dependent on the industrial nations of Europe to meet the wants of home consumers. That European manufacturers are not ignorant of the commercial conditions of Roumania, however, is evidenced by the rapidly growing imports from such countries as Germany, Great Britain, Italy and Belgium, not to mention Austria-Hungary, whose location right at the door of the Balkan states gives it a peculiar advantage in Eastern markets.

Roumania, it should be mentioned, is a prospering land. Heretofore pre-eminently an agricultural country, the recent development of Europe has been the direct cause of the beginning of a manufacturing industry, which, in a few years, promises to raise the Roumanians to a higher prominence than was ever thought of five years ago. During the past year or two commercial reports from Bucharest, the capital city, have constantly been chronicling the founding of new industries, backed by both foreign and domestic capital, that, if successful, will give the Balcan states a very extensive category of mechanical interests. Chief among these may be named the sugar and clayworking plants.

Indeed, clayworking ranks foremost among the industrial interests of Roumania. Considering its comparatively recent development, it has even now attained an advanced state of progress, as may be gathered from the information that the city and suburbs of Bucharest alone lay claim to thirty plants. The most of them are, it is true, relatively small and rudely equipped, but among them are several very fair specimens of up-to-date works. An idea of the capacity of the latter is furnished by official statistics showing an annual production of one plant during the working season of seven months of eight million bricks.

Taking a list of the Bucharest works, we find the chief plant to be the Fabrica de Basalt Artificial, a company engaged in the production of artificial basalt, with an additional annual output of three million bricks. This firm possesses the largest and best equipped factory in Roumania. It is fitted throughout with improved German machinery, mostly from the firm of Schlyckeisen, and its field of operation covers the manufacture of paving bricks, tubes, porcelain stoves and a number of other lines of minor importance. Another basalt works similar to that of Bucharest is located at Buzere, and is called the Bilmer works. In addition a large plant is in operation at the port of Constante, another at Craicoa and still another at Jassy, the last named belonging to the management of the Roumanian railways. Messrs. Balentinear, of Bucharest, are also important makers of concrete tubing.

The remaining large brick plants of Bucharest are known as Mitica Hagi Theodorake & Cue., Engineer N. Cuzarida, Max Tonola, Societata de Constructiuni and Thoma Dobrescue. The yearly production of all these firms is placed at the million mark, the figures ranging all the way from 3,000,000 to 8,000,000 bricks per plant. Of the others, as already stated, little mention need be made, since their capacities are exceedingly limited, and the methods of production pursued therein are confined to the crudest forms now in use.

The principal clayworking machinery employed in Roumania at present is of German origin. Heretofore the great bulk of the trade in supplying the domestic works has been monopolized by the firms of Schlyckeisen, of Berlin; Boltze & Cie, of Braunschweig, and E. Leinhaas, of Freiberg, in Saxony. These firms have for a comparatively long time paid strict and close attention to Roumania, and the fruits of their studies are now becoming apparent in a wide and profitable trade. Schlyckeisen, perhaps, enjoys the lion's share of success in Roumania, partly because of the world-wide reputation acquired by his machinery, but more particularly by reason

of the excellent methods of soliciting business followed by the great German house. In every land where clayworking is carried on Schlyckeisen's agents and travelers are to be found. His travelers make periodical journeys through the clayworking districts of Europe, both for the purpose of establishing agencies and of assisting local representatives to gain hard customers. This is recognized as the only sensible, and, in short, possible way to secure business where competition is sharp and keen.

American manufacturers of brick machinery who are at present looking abroad for business would do well to follow in the footsteps of the Germans in this respect. If the Germans find it profitable to send a man to Roumania, for example, the same rule should work if applied to manufacturers in the United States. American machinery is certainly superior to the German. In cost, too, it has an advantage over the latter, possessing greater capacity, labor-saving qualities and compactness. Hence, to sell it there is needed only push and system, and these should prove the smallest obstacle in the way of an export trade. Our machinery has already a good reputation abroad, and manufacturers in this country should make it a point to include Roumania among the future countries of destination for their machinery.

WRITTEN FOR THE CLAY-WORKER.

BRICK ARCHITECTURE.

THAT BRICK, by that is meant all forms of clay used in building, is coming into more general use than ever before is certain. A walk about any city or large town will prove that statement without the necessity of resorting to argument. Assuming that the statement is admitted, it becomes interesting to gather, if possible, whether the present almost universal use is to be continued or whether it is to be dropped eventually as architects have dropped other building material. If this question can be answered satisfactorily to the manufacturer or the intended manufacturer of brick, combine or not, he will consider his future much more encouraging than it looks even now.

A building material is chosen more for its utility than its actual appearance in these times. This is not saying the brick doesn't look as well as other varieties of building material, because it does, but it is a statement of fact. As it is a statement of fact, it cannot be ignored, even though there appears to be an element of slight animadversion upon brick in it. The question to be decided at this point is that utility, and not appearance, influences modern builders. If a material strong, comparatively light, mobile and indestructible were presented builders would select that, even though its outward appearance was the essence of ugliness. A coat of paint would hide all that, and the additional expense of providing it would be more than compensated for in the cheapness of the main material.

To determine what the probable future of any building material is likely to be, it is necessary to understand how the coming generation of architects and builders regard it. If they look upon it favorably there is no question of its being freely used in all constructions where it will harmonize with the general plan. If they look upon it in the light of a temporary article, something which may be popular now, but will be cast aside within a few years, the ultimate result is obvious. The matter would require no further consideration.

In this particular, therefore, it becomes of the utmost importance to know that the younger architects and builders regard brick as the one material which combines all the essential qualities required in a perfect building matter. It is cheap; it is light; it is strong, its crushing strength being entirely satisfactory; it is practically indestructible, neither fire nor water having much impression upon it; it is mobile, easily transported and handled and easily fashioned into any desired size and shape; it comes as near being the ideal building material as has yet been discovered. Even its plainness has been overcome by adding pressed brick, which can be made into as graceful and attractive ornamentations as were ever carved from the choicest marble.

The writer of this has taken some pains to ask the younger architects of New York what they consider the best general utility building material. Almost without exception they answered brick. They agreed substantially in the statement that it would be used more and more and would eventually practically supplant all varieties of stone. They were also unanimous in the statement that the improvement in brick manufacture during the past few years was largely responsible for the enlarged use of it as a building material, and that if improvements continued there would be no question about the market nor about remunerative prices for everything that could be manufactured.

Said one, in discussing the subject, and his views coincide with those of all who were seen:

"The great necessity in building in these times is to secure some material that is fireproof, that will stand the weather and will not be too expensive. There isn't a stone used in building that meets the requirements. Leaving out of the question the item of expense, the stone used in constructive work is destructible by fire, and if not by fire, by fire and water combined. Throw a stream of cold water on a piece of granite, the most stable of rocks, when it is hot, and it will explode as though a charge of powder had been hidden inside. Marble will melt under a combination of fire, water and intense heat. The minute shells, of which it is composed, seem to fuse and actually run like melted glass. Limestone is open to both objections. It will crack and fuse also. I have seen limestone fused and glazed as though it had been in a glazing kiln, after a fire.

"These objections are important because, notwithstanding the multiplication of fire apparatus, the fire hazard has increased, as the statistics of insurance companies prove. It becomes, therefore, very important for a number of different reasons to select some material that will withstand fire, water and intense heat. Brick is the one thing that will do it. Being of burnt clay, fire has no effect upon it. A red-hot brick is as strong as a cold one, and a red-hot brick dropped in water merely cools. It doesn't crack and explode. It continues to do its work just the same. Therefore, a building constructed of brick will not be destroyed by the same causes that would operate to destroy a stone structure. It would safely withstand what would ruin the stone, and not only that, but would come out of the fire with as much life as it had when the fire began.

"Some critic may point to the crumbling bricks in an old building and say that there is sufficient proof that they soon decay. But such a thing could not happen now. The crumbling is due to imperfect burning, and now all such bricks are sorted out and used when short life is quite as valuable. They are never put in buildings where stability for long periods of time is essential. There is a careful selection of bricks for building purposes which renders the presence of crumblers in any important structure absolutely impossible.

"Bricks are cheap. There is no material which can be purchased as cheap, all things considered, as brick. The improvements in methods of manufacture have been so great that they cost only a portion of what they once cost, hence more people can use them than formerly. They can be utilized for business and renting property where cheapness in an absolute essential in construction. Nor is the end of improvement in maufacture in sight. There will be further developments, which will still further reduce cost. All these points are important, particularly if a building is contemplated which is to cost many thousands of dollars. The increasing use, for different purposes, about all buildings indicates that the cost is considered a feature worthy careful study. It is nearly always selected where cheapness and utility are elements which must be considered.

"The ornamentation of buildings can be accomplished easier and cheaper with pressed brick than in any other way. The expense of pressed brick is much less than the same design carved in stone, and architects specify it whenever ornamentation must be sacrificed on the score of expense. It enables them to construct handsome buildings at low cost and still have them indestructible so far as it is possible to make them so. These few points will indicate something of the lines upon which architects are now working, and are probably a good explanation of the future of brick."

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SEVENTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIV. SEPTEMBER, 1900. No. 3.

CURRENT COMMENT.

Fortunately for all of us, just as the political atmosphere becomes heated the weather man brings the hot spell to a close, a relief for which we are truly thankful.

* * *

We do not remember any presidential campaign so mild as the present. Business goes on, as it should, unvexed by political turmoil. There is an utter lack of the excitement which usually proves so disastrous to trade.

* * *

Perhaps when the spellbinders really get down to business, General Apathy may be routed and business be shelved for a few weeks while we indulge in the pastime of politics. In that event, we advise our readers to keep cool. Don't fret, but remember that the world will go on just the same whether the ins stay in, or the outs trade places with them.

* * *

The N. B. M. A. loses one of its most faithful and efficient workers in the death of J. W. Carson. His voice will be missed sadly at our annual gatherings, where it ever spoke cheerful, helpful words to his fellows. His place may be filled, but the memory of his virtues, and his earnest enthusiasm will live on till those who knew and loved him have themselves joined the silent majority.

* * *

"The Brickmaker to the President" has returned from his trip abroad, and if we may judge from the store of amusing incidents with which he is loaded, he did not have many idle moments during his absence. He went abroad for pleasure, and he found it, as we knew he would. He promises to tell our readers some of his experiences in the near future, and to reserve a few tidbits for the lobby sessions of the next national convention.

* * *

On another page we publish the first of a series of articles on the clay exhibits of the Paris Exposition. It is not our scribe's intention to deal in glittering generalities, but to tell of what may be found there of special interest to clayworkers. We are impressed with the idea that the press of the country has not manifested the interest in this great exposition that it deserves. Much has been written about it, but little of a serious nature touching on the art and industrial features of the great show. Many of the correspondents who have gone there have written about the Moulin Rouge, the Casino de Paris, and the gay life in Paris, which would indicate that they used their nights well and their days in sleep, thus neglecting the things of serious import.

BUILDED ON THE SAND.

One of the most horrible disasters of late years is the destruction of Galveston. It was a city "builded on the sand," the sea rushed over it, leaving a mass of ruins in which are buried countless dead. Before the daily press has completed the record of death and disaster there comes the report of the work of rebuilding the city. Doubtless in the course of a few months a new and possibly better city will be erected upon the same site, though to those of us at a distance this seems foolhardy, for in all likelihood it will be only a matter of time when the same fate will overtake the new Galveston, as it did the old. In view of this it would not be strange if large insurance companies and trust organizations should decline to make investments such as will be necessary, except at very high rates of interest. If the work of rebuilding should be handicapped in this way, and thus lead to a selection of a more stable location, it will be better for the community. Galveston will rise again surely, but we hope it will be upon a safer foundation.

THE WEAK SIDE OF ASPHALT PAVEMENTS.

It is now claimed by the Brooklyn papers that the asphalt streets in that city are cracking and going to pieces in a manner that indicates short life for many of their paved streets. The matter has been investigated, and it is claimed that the rotten spots are caused by bad leaks in the gas mains beneath the pavements. If a bar is driven down to a gas main at such points and a match applied at the opening thus made in the soil, it is said that the gas will often ignite. Tests made indicate that the gas, which is known to decompose bituminous compounds, is the destroying agent which is playing havoc with the asphalt streets.

The situation is so serious that the asphalt companies who are bound by guarantees to maintain pavements in good order for certain periods, contemplate suing the gas companies to recover damages to the pavements.

It strikes us that the best way to avoid these troubles is to substitute good brick pavements for the asphalt. Properly and carefully laid, brick make a cleaner and more durable pavement than asphalt, and they are not effected by escaping gas or leaky hydrants. A good brick street never rots nor crumbles, and is better in every way than any tar or asphalt mixture.

AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.

The third annual convention of the American Society of Municipal Improvements was held at Milwaukee, August 28 to 31. There was a large attendance of representative city engineers from all sections of the country, and a number of instructive papers were read treating on various phases of municipal work. Of course the paving and sewerage questions claimed considerable attention, and on a preceding page we give the full text of an interesting paper read by E. A. Kemmler, on the brick pavement of Columbus, O., which will bear very careful reading. This and other questions relating to city engineering, sanitation, sewerage, testing of cements, materials for paving, etc., received serious consideration, and the result is increased knowledge that tends to the betterment of our cities, which means more healthful and more comfortable liv-

ing for those of us who spend our lives in these human beehives. Hence, the work of this association is of immense importance.

One of the results to be hoped for is a wiser selection of constructive material. The more thoroughly our city engineers and municipal officers inform themselves as to the real merits of cements and paving materials the better it will be for clayworkers, for their products certainly are superior in qualities of durability and cleanliness to any other materials now in use. If we can impress this fact upon our city engineers, councilmen, mayors and other public officials an increased demand for clay products will follow.

TRANSACTIONS OF THE AMERICAN CERAMIC SOCIETY

—A Valuable Work for Students of Ceramics.—

A handsome book bearing the above title and containing the papers and discussions of the second annual meeting of the A. C. S., held at Detroit, Mich., February 6 to 8, 1900, has been received. The matter is edited and published under the direction of Prof. Edward Orton, Columbus, O., and makes a substantial octavo volume of 278 pages. It is in a sense a text book in the art of clayworking. As our readers know, the ceramic society is a techincal and scientific body, an offshoot from the National Brick Manufacturers' Association, with which it is closely allied, but differs in that it considers and discusses subjects of a purely technical character. The report includes a number of interesting papers, which will, in time, be published in The Clay-Worker, for though the report has been copyrighted, the privilege to publish has been granted provided proper credit is given to the society. This will prevent the publication of old papers as the up-to-date productions of the society, something our cotemporaries have been guilty of recently.

To the student of ceramics the volume is well nigh invaluable. Those not members of the society can obtain copies by remitting $1.00 to the secretary, Prof. Edward Orton, jr., Columbus, O.

NEW YORK SCHOOL OF CERAMICS AND CLAYWORKING.

An important innovation in school work in the Empire State is the opening of a department of ceramics at Alfred University, which occurs this month. In a neat pamphlet, telling of the object and equipment of the school, it is stated that the demand for the school arises from three considerations. (a) The vast undeveloped resources of the State in clays and shales. (b) The enormous importation of fine ceramic wares. (c) The necessity for trained clayworkers, who should be able to utilize native clays and to produce native wares.

The great utilitarian field occupied by clay wares is attracting public notice on every side. Clay in one form or another constitutes the great mass of modern fire-proof building material, and the larger part of general constructive material is derived from the same source. The rapid decrease in the timber supply and consequent advance in the cost of woodwork is bringing into general use brick, hollow blocks, terra cotta quarries, roofing tile and other clay products, so that it becomes evident that the clay pit and shale bank will eventually supply the builder almost entirely.

The wisdom of locating the school at an established seat of learning and in close proximity to clayworking industries must be apparent to all. No branch of study can stand alone. The student of clayworking should be educated in collateral departments of science and art. For this work Alfred University offers splendid advantages. Laboratories of chemistry, and physics, libraries, museums of geology and natural history, workshops for manual training, and all the departments of liberal culture are available, so that the many and varied requirements of a complete education are fully met. It is the purpose of the school to give a practical training in the technology of clayworking, neglecting neither the science nor the art. Attention will be given to the improvement of methods of manufacture and the reduction of cost to the end that the resources of the State may be fully developed, and that within its borders may be manufactured the clay wares now brought from other States or countries at an enormous annual cost.

A new building has been erected especially for this department, and is equipped with all of the machinery and appliances to carry on the work effectively. Prof. Charles F. Binns, the director of the department, will be ably assisted by Prof. Daniel C. Babcock, Miss L. W. Tourtellotte and other experienced instructors. Students who are residents of New York State are exempt from the payment of tuition. Students from other States will have to pay $50 per annum and small laboratory fees to cover cost of breakage of appliances, etc. Those contemplating applying for admission to the school are requested to address Prof. C. F. Binns, Alfred, N. Y., who will give full information relative to qualification, requisite for admission, which are, in brief, that the student must be at least sixteen years of age, and of good moral character, must give evidence of proficiency in English composition and reading, arithmetic and simple mathematics.

The benefits to be derived from the course of ceramics will be an ability to take up the practical work of the manufacture of clay wares, lay out plans for the erection of clayworking manufactories, selection and operation of machinery and other appliances, and the designing and manufacturing of various clay wares. As stated in the pamphlet referred to, it is difficult to conceive of any more attractive work than the solution of the problems in chemistry, physics and art presented to The Clay-Worker. Furthermore, the field for skilled and educated men in this line is practically vacant. There is no calling in industrial work offering greater opportunities than are now presented to the educated chemist.

TRADE LITERATURE.

THE DEAN BROTHERS' Steam Pump Works, Indianapolis, Ind., are sending out a new catalogue of their products, which include almost every variety of up-to-date steam pumps now on the market. Those of our readers who want a pump of any style or capacity will do well to write for a copy of this, their latest catalogue, which is handsomely illustrated, and can be had for the asking.

A NEAT PAMPHLET bears the imprint of the Fernholtz Brick Machinery Co., St. Louis, Mo. It is illustrated with cuts of the Fernholtz press, the Fernholtz clay mixer and the Fernholtz clay pulverizer, and contains a series of testimonial letters from users of these machines, which indicate that they are filling long-felt wants in many successful brick plants throughout the country. The F. B. M. Co. will gladly mail a copy of the pamphlet to any dry press brick manufacturer requesting it.

A LECTURE ON COMBUSTION is the title of a pamphlet received from the U. S. Rocking Grate Bar Co., 225 Dearborn street, Chicago, Ill. It is uniquely illustrated, his Satanic Majesty being the conspicuous figure. As he is an undoubted authority of heat units, the matter is authentic. Those who want to learn how to save 10 to 30 per cent. of their coal bills and keep a steady and uniform steam supply are requested to drop the above firm a postal card.

ONE OF THE HANDSOMEST trade catalogues that has reached our desk for a long time is that issued by the C. W. Raymond Co., Dayton, Ohio. The cover is particularly pleasing, the design shows one of their 777 stiff clay brick machines in the foreground, back of it are two sturdy sons of toil laying up a wall of pressed brick, and above them the name and address of the C. W. Raymond Co. appears in bold relief against a clouded background. Within the covers we find a series of very handsome engravings; that of their A1 automatic cutting table and "999" brick machine is particularly

fine, being worthy of a frame. Their other brick and tile machines, cutting tables, pug mills, represses, soft mud brick machines, disintegrators, clay elevators, etc., of which they make a large variety, ranging from large to small capacity machines, are all carefully described and neatly illustrated, as are also a full line of brickyard supplies, such as dump cars, tempering wheels, brick molds and barrows. The book also contains illustrations of a large variety of ornamental brick made on the Raymond presses. The catalogue will be mailed to any of our readers who write for it, mentioning The Clay-Worker.

WE ARE INDEBTED to H. W. Spangler, professor in charge of the mechanical and electrical department of the University of Pennsylvania, for a directory of the graduates of that department of the college. The little book is bound in leather and illustrated with half-tone views of the various college buildings. With it Prof. Spangler encloses a pamphlet, giving the following interesting data relative to the University:

The University of Pennsylvania was founded in 1740. Its development within the past decade may be judged partly from the following: In 1890 it had 1579 students and 180 instructors. It has now an enrollment of 2673 students and a staff of 260 instructors. Of its thirty-four buildings, twenty were added during the past ten years. The buildings and equipment, exclusive of land, represent an estimated value of $4,649,592 and an actual expenditure of $3,159,947 since 1890.

The courses in civil and mechanical engineering were established in 1872; those in electrical and chemical engineering in 1891 and 1892 respectively. There are at present 306 students in the Towne Scientific School, of whom 172 are pursuing courses in engineering. The graduates number 469, of whom 445 are living. Of these, about 71 per cent. are engaged in engineering practice, 12 per cent. in lines related to engineering, 13 per cent. in other professions and pursuits, and the addresses of the remaining 4 per cent. is unknown.

TRADE NOTES.

Wm. Haggerty, Lincolnville, Ind., is in the market for a good soft mud brick machine.

J. F. Scott & Son, of Flenniken, Tenn., are in the market for a large number of brick cars.

The Patton Vitrified Brick Co., at Cloverport, Ky., will enlarge their plant materially.

Davis & Laud, of Beaumont, Texas, advise us that they desire to purchase a good second-hand four-mold dry press brick machine. A Berg or Boyd press preferred.

In a recent letter renewing subscription the Alexandria (Va.) Brick Co. say: "Business has been very good with us this year. We have made more brick than for several seasons past and have found a ready market for them. Accept our best wishes for the success of The Clay-Worker.

As an instance of direct returns from advertising the Burt Manufacturing Company, of Akron, O., report that they are crowded with orders as the result of an illustrated notice of their Burt exhaust head, which they have only recently commenced to advertise.

"Any article of merit," said Mr. Warden, manager of the company, "can be pushed successfully through judicious advertising in the trade journals, as we have demonstrated, to our own satisfaction, at least."

THE ELGIN (TEXAS) PRESS Brick Co. are advising their patrons by postal that, owing to the serious damage wrought by the storm of September 9, it will be impossible for them to operate their plant for several weeks. Their clay storage sheds were completely wrecked and the small stock of dry clay in same rendered unfit for use. Roofs of two of their kiln sheds and their smoke stack were demolished. They are now making repairs and hope to be running again in a short time.

TABLE OF CONTENTS.

At the Paris Exposition..... 179
Gold Bricks and Clay Testing.. 181
An Arkansas Brick Plant..... 183
Fire Brick: Their Manufacture and Uses..... 184
The Latest Modification of the Tunnel-Kiln as Constructed by Moeller & Pfeifer..... 186
The Brickyard Nearest the North Pole..... 187
Utilization of Waste Material and Forces..... 187
Obituary 188
Vitrified Brick Pavements in Philadelphia 190
Construction and Maintenance of Brick Pavements 192
Good Roads a Paying Investment 196
Button-Hole Talks..... 197
A Fine Record..... 197
In Philadelphia Brickyards.... 198
The Hygrometer and Pyrometer 199
Midsummer Meeting of the National Stove Lining Manufacturers' Association 200
The Trusts and the Small Brick Factories..... 201
By the Light of the Kiln Fire.. 202
?????? 203
The Manufacture of Brick in Roumania 211
Brick Architecture 212

CORRESPONDENCE.

In and About Pittsburg..... 200
Way Down in Maine 208
Buffalo Brick and Building News 208
The Chicago Brick and Building Situation 208
Down in Jersey..... 209
From the Kentucky Metropolis 210
Capital Brick and Building News 210
The New York Brick Market.. 222
Pacific Coast News..... 224

EDITORIAL:

Current Comment..... 213
Builded on the Sand..... 213
The Weak Side of Asphalt Pavements 213
American Society of Municipal Improvements..... 213
Transactions of the American Ceramic Society..... 214
New York School of Ceramics and Clayworking 214
Trade Literature 214
Trade Notes..... 215
Editorial Notes and Clippings. 218

MISCELLANY:

Willing to Compromise 180
To Promote Longevity 184
Business and the Postoffice.... 185
Cement from Furnace Slag.... 192
Only one Danger 200
Awarded a Gold Medal..... 203
Could Use it..... 224

Index to Advertisements on Front Inside Cover Page.

WANTED.

A Chaser, second-hand. Address particulars to "W. P." care Clay-Worker.
91d

Mention THE CLAY-WORKER.

WHEN WRITING TO ADVERTISERS

Mention THE CLAY-WORKER.

The Carnegie Steel Co.

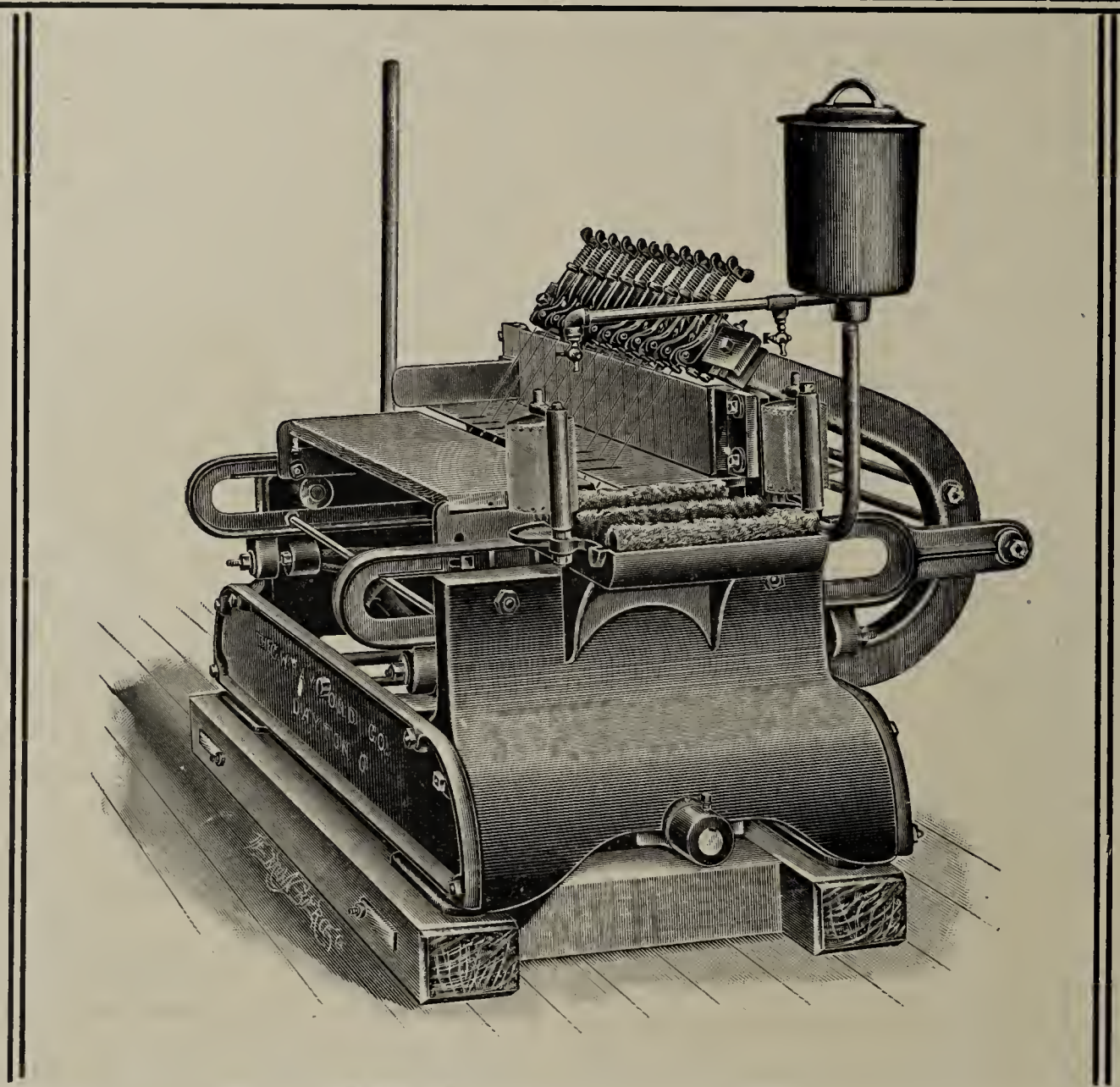
Is one of the big manufacturing concerns which have sent duplicate orders this month for

Cross Oil Filters

Others as prominent are ordering from all over the civilized world.
Only merit counts with these purchasers.
We guarantee the Cross to save half your oil bills, and send them on approval at our expense.

The Burt Manufacturing Co.,
Akron, Ohio, U. S. A.
Largest manufacturers of Oil Filters in the World.
We also manufacture the BURT EXHAUST HEAD.

The RAYMOND Down Cut Board Delivery CUTTING TABLE.



Our Line of Stiff Mud Machinery

Is in use throughout the civilized world in hundreds of the largest yards, giving the best of satisfaction to its users. This universal recognition of its merits is the highest encomium that can be offered. Its design is the result of twenty-five years of hard study and experience, and into its construction enters nothing but the best of materials and workmanship. You make no mistake in using a **Raymond Auger Machine.**

Our Line of Soft Mud Machinery

Is no experiment and is daily winning its way into the favor of the progressive brickmakers. We are selling large quantities of them and each and every one, as it is placed in position, is doing more than we promise. **The Raymond No. 1 Horizontal Stock Brick Machine** occupies the highest pinnacle of success in Soft Mud Machine construction.

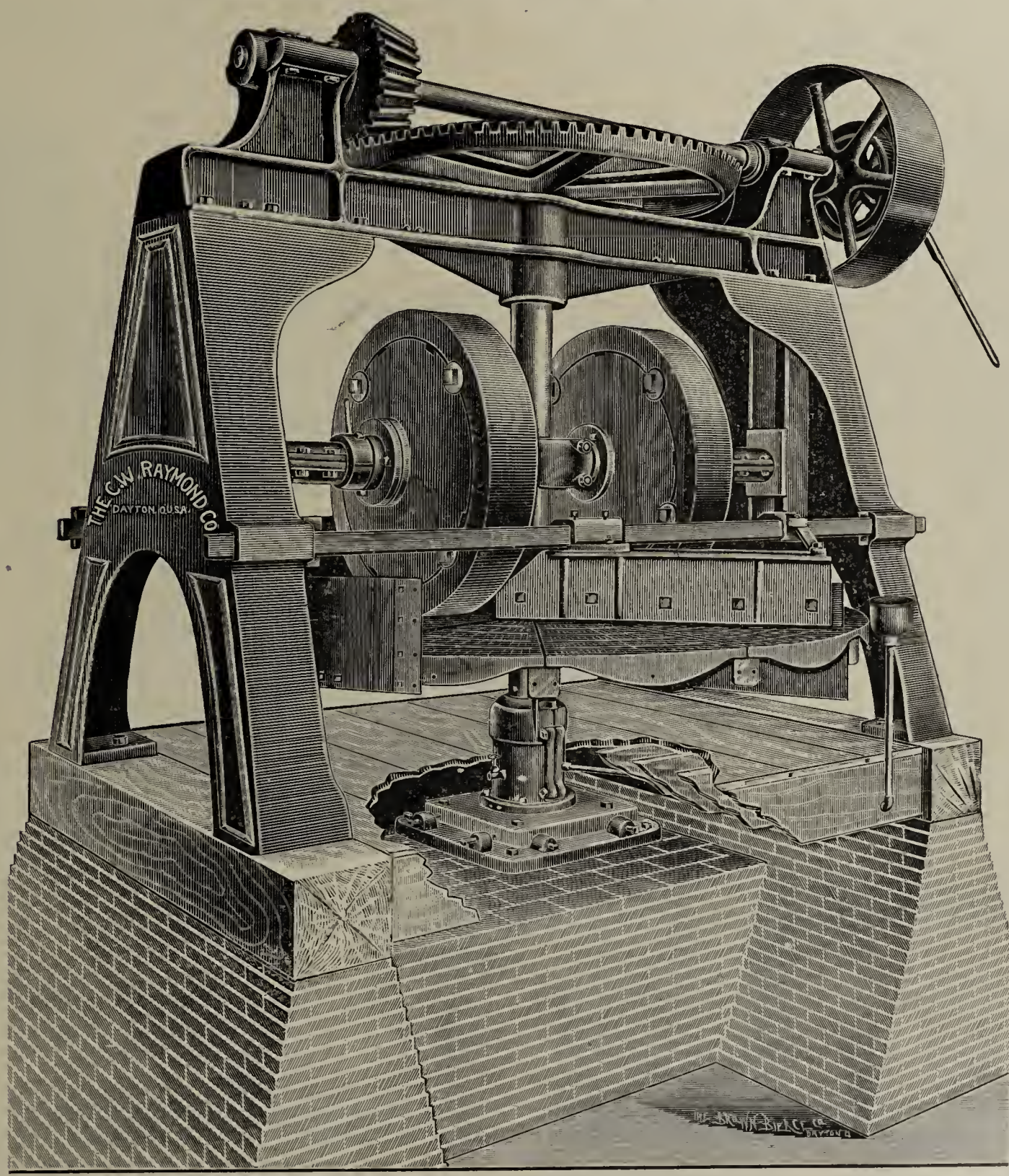
The C. W. RAYMOND COMPANY,

Send for our New Catalogue. *Dayton, Ohio, U. S. A.*

Do You Realize the Advantage

Of weight, solidity and strength.
Of the absence of all springs and pieces of light and trivial construction.
Of large and substantial gearing so arranged that it cannot get out of line,
Of muller rims so attached that they will not work off,
Of mullers with renewable hubs, all lathe turned and centered so they run absolutely true,
Of a step that will not heat or show undue wear, and which is absolutely dust proof,

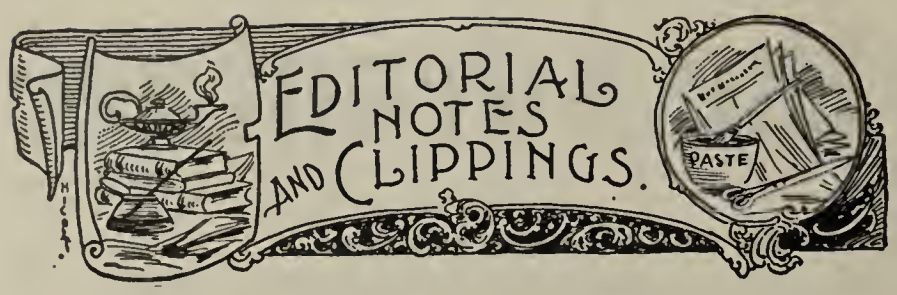
IN A DRY PAN?



RAYMOND IRON FRAME DRY PAN.

If you do, drop us a line and we will tell you all about one that possesses, not only these, but a hundred other valuable points, that you cannot afford to be without.

The C. W. RAYMOND CO., Dayton, Ohio, U. S. A.



J. A. Sheek will start a brick plant at Yadkinsville, N. C.

A new brickyard has been started at Tina, Mo., by L. T. Davis.

A brickyard will soon be started at Did, Tenn., by A. Heaberlin and others.

A new brick plant has been started at Benson, Texas, by E. T. Ferris, of that city.

Joseph Wilson, of Pawpaw, Ill., contemplates building a tile factory at Pomeroy, Iowa.

M. J. Savage, Rose Hill, N. C., writes that he is in the market for a horse-power brick machine.

Fire completely destroyed the drying sheds of the Musser brick and tile plant, near Elmore, Ohio.

The brick yard of A. J. Hawks, Saccarrappa, near Portland, Me., was slightly damaged by fire recently.

Fire caused a loss of $200 at the plant of the Wisconsin Red Pressed Brick Co., at Menominee, Wis., recently.

The brick plant of Katterjohn & Co., Paducah, Ky., was slightly damaged by fire, which started in the kiln sheds.

George Battey is erecting a brickmaking plant at Wallace, Nova Scotia. It will have a daily capacity of 35,000 brick.

Thomas Dunn, of Pittsburg, Pa., has purchased land near that city, on which he will erect a large brickmaking plant.

Parker, S. D., wants a brickyard. Parties interested should address the publishers of the Argus and Leader at Sioux Falls, S. D.

Thomas H. Dwyer and T. N. Wund have purchased a tract of land at Brenham, Texas, on which they will erect a brickyard.

Wilcox Bros., Cadillac, Mich., suffered a slight loss by fire at their brick plant recently, which was entirely covered by insurance.

A new brickmaking plant, of which John Gawley is manager, is being constructed at South Seattle, Wash., by New York capitalists.

The Rock Brick Co. has been incorporated at Rockford, Ill., by John P. Palmer, C. G. Gustafson and E. H. March. Capital stock, $3,000.

Saul & Kruger, press brick manufacturers at Sherman, Tex., will put in an equipment for the manufacture of vitrified paving brick.

McIntyre Bros. are building a new brick plant at Montgomery, Ala., which when completed will recommend an investment of $25,000.

The brickyard of Whiting & Woodward, at Winslow, Ind., was entirely destroyed by fire August 24. The loss is estimated at $5,000, with no insurance.

Joseph Bowman, owner of the Kittanning (Pa.) Brick Works, died at his home in that city September 8. His death was due to dropsy. Three sons survive him.

The Pennsylvania Fire Brick Co. will erect a new plant at Beech Creek, Pa. Ground has been broken and the completion of the plant will be pushed as rapidly as possible.

Richard L. Mudge, superintendent of the Acme Brick Co., at Marietta, O., died August 15 of typhoid fever. He was but 37 years of age, and leaves a wife and two children.

A new company, known as the Ohio Brick and Pottery Co., capitalized at $10,000, has purchased the Mullins brickyard, at Warren, Ohio, formerly owned by the Horton Mfg. Co., of Painesville, Ohio. The incorporators are Austin Miller, A. L. and C. R. Dennison, L. Reichard and others. Mr. Miller will be manager.

C. J. McDonald is building another brick plant at Johnston Station, Ga., which he will operate in connection with his old plant, which has been in operation a number of years.

The Blandford Brick and Tile Co., at Russell, Mass., sustained a $300 loss by fire in their kiln sheds. All the rest of the plant is in fireproof buildings, and so escaped damage.

The Brooklyn Brick and Sewer Pipe Co. has been incorporated with $25,000 capital. The directors are Fred Johnson, H. Fordham, of New York city, and Geo. D. Beatty, of Brooklyn, N. Y.

Edward Neff, a veteran brickmaker of Saegersville, Pa., died at the home of a daughter in Slatersville, September 7, where he had been visiting. He leaves six children, all of whom are grown.

Frederick Barrentz, superintendent of the Owen Terra Cotta Works, at Hobart, Ind., was caught in a cave-in at the clay bank and crushed to death. He was 38 years old and leaves a family.

Robert Hales & Son, of Rapid City, Manitoba, Canada, had a very successful season the past summer and intend to put in a new plant next spring in order to meet the increased demand for their product.

Fire damaged the yard of the North Adams Brick Co., at Braytonville, Mass., August 15 to the extent of $1,500. The loss is fully covered by insurance and the damaged portion of the works will be rebuilt at once.

John L. Owens, a prominent brick manufacturer and contractor, died at his home in Harrisburg, August 18. He was 73 years old and had been in the brick business over forty years. A widow and five children survive him.

A large tract of land has been purchased near Lock Haven, Pa., on which an immense fire brick plant will be erected in the near future. James A. Bickford, T. M. Stevenson and John P. Wynn, all of Lock Haven, are interested.

The Copeland Brick Co., Birmingham, Ala., have recently booked a number of orders that will keep them busy for some time. Among their orders is one for 3,000,000 brick for the Semet-Salvay Co.'s coke ovens at Ensley, Ala.

John M. Cranor, of Daleville, Ind., has purchased the buildings and machinery of the brick plant at Chesterfield, and has moved the entire equipment to his Daleville plant to repair the damages sustained at the latter plant by fire recently.

The Diamond Fire Brick Co., of Canon City, Colo., are making a number of improvements at their plant in order to meet the increasing demand for their brick. They will put in a brick machine of 40,000 daily capacity and enlarge their kilns.

On the night of August 17 twenty-five racks, covering one and one-half acres at the plant of Waterton (Wis.) Press Brick Co., and holding 300,000 brick, fell in for some unaccountable reason. The damage to the brick and the cost of repairs is estimated at $1,200.

G. E. Moody, of Waterbury, Vt., reports an unusually busy season. He has turned out close to 2,000,000 brick, for all of which he has found a market. He not only supplies his own local market, but ships bricks to nearby towns, such as Montpelier, Barre and Northfield.

H. C. Hass has purchased a large tract of land at Fond du Lac, Wis., on which he will at once begin the erection of an immense brickmaking plant, which he will run in connection with his present plant, which has become entirely too small to fill his steadily increasing orders.

The new plant of the Reese-Hammond Fire Brick Co., at Curwensville, Pa., has just been started up. James Hammond,

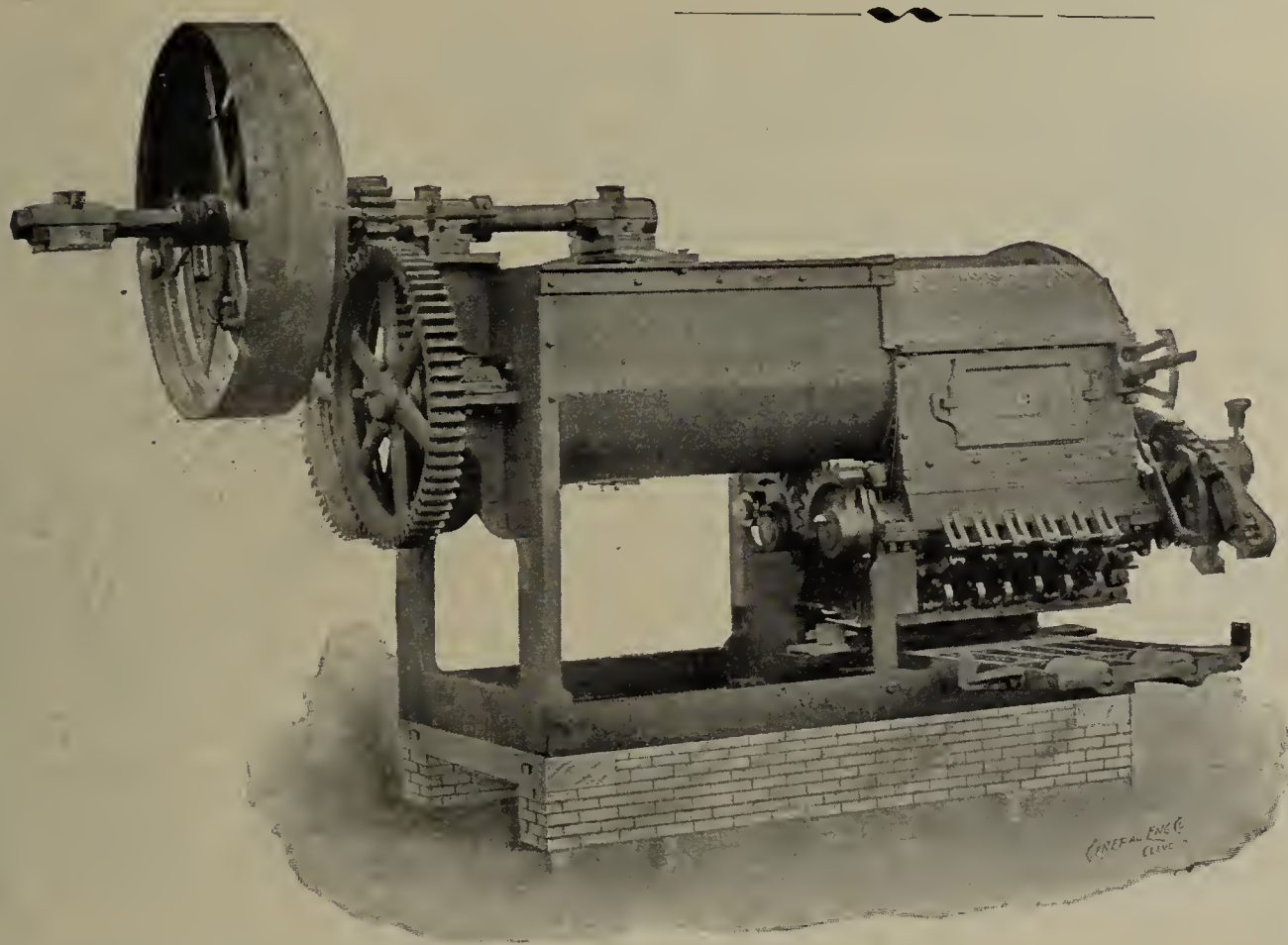
[CONTINUED ON PAGE 220.]

LIGHT HOUSES

Do not have to hire bands or fire cannon to call attention to their shining—**THEY JUST SHINE.**

Thus it is with the two "soft-mud" machines we manufacture (one horizontal and one upright). **Each** is at the head of its respective class, and the number of each in use, (note the figures)

TELLS THE WHOLE STORY.



Over 100 "Monarch" Brick Machines In use.

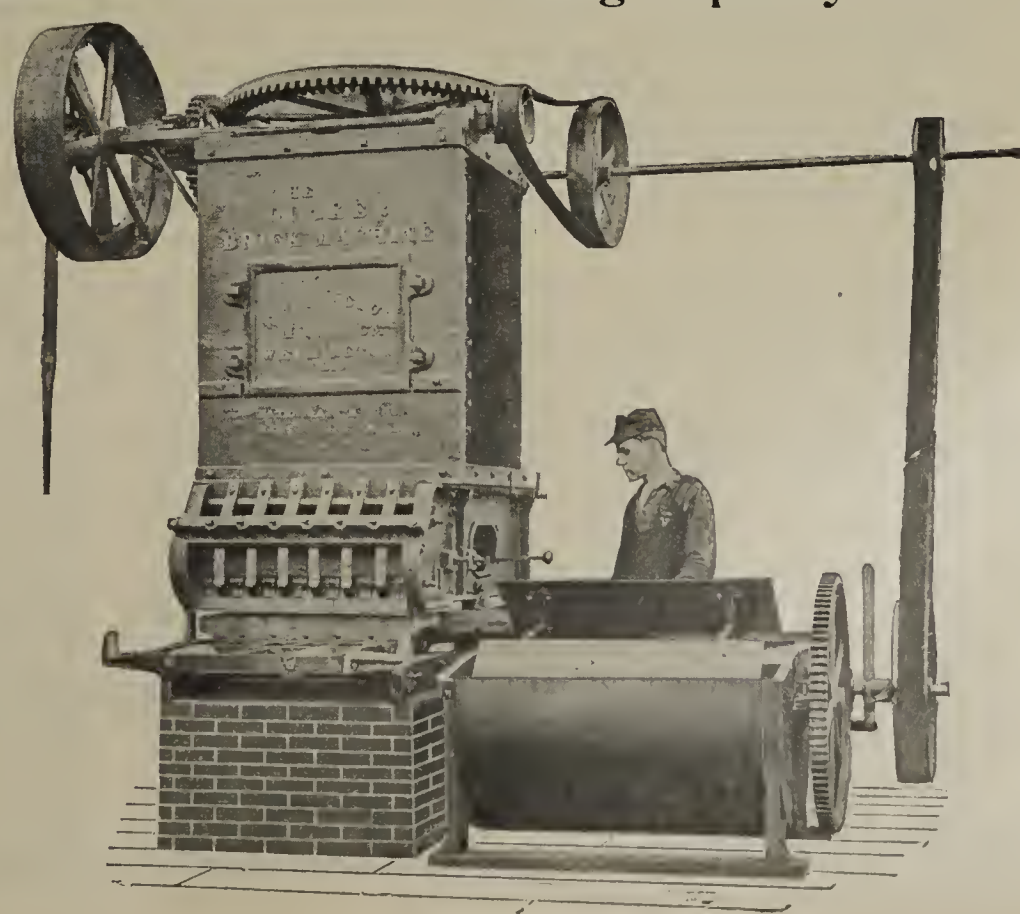
Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

Our mould-sander is the best, simplest and cheapest.

With our Roller-bearing Brick Barrows you can wheel 20 per cent. more load and do it as easily. Order one subject to approval.

ALL OTHER SUPPLIES. Send for Catalogue.



The Wellington Machine Co.,
WELLINGTON, OHIO.

EDITORIAL NOTES AND CLIPPINGS—Continued.

of Clearfield, is in charge of the plant. Fifty men are employed at present, but this number will be increased to 200 when the plant is well under way.

The Drury Brick and Tile Co., of Burlington, Vt., contemplate improving their yard, putting in an equipment that will enable them to operate the plant the year round. Owing to their recent fire the plant must be rebuilt and the owners have decided to make it an up-to-date plant in every particular.

Charles B. Cornwell, long a respected citizen of Batavia, N. Y., and for many years a brick manufacturer, died August 17 at his home in that city, at the advanced age of 80 years. He moved to Batavia in 1851, and at once began the manufacture of brick, which he continued for almost half a century.

The first kiln of brick at the new plant of the Tomahawk (Wis.) Pressed Brick Co. was opened recently and the quality of the brick is fully up to the predictions of the manager, L. R. Jacobs, who has superintended the erection of the plant. The new plant will be kept busy in order to meet the local demand for brick.

The Union Brick Co. is the name of a new concern at Monterey, Mexico. They will manufacture building and paving brick and sewer pipe. They have purchased $60,000 worth of machinery from the American Clayworking Machinery Co., Bucyrus, Ohio, and will begin operations as soon as the machinery is installed.

The Escambia Manufacturing Co. have made arrangements to improve their brick plant at Pensacola, Fla., increasing their capacity to 50,000 brick. While the company now supplies a large local demand, it is its purpose to do an export business, sending a large portion of their product to Cuba and Central American points.

Mr. A. H. Loomis writes that he and his son William, formerly operating the Clermont (Ia.) Brick and Tile Works, have sold their plant to C. Miller & Son. Mr. A. H. Loomis will retire from active business life, while William goes into the newspaper business, taking the editorship of the Atlantic (Iowa) Tri-Weekly Messenger.

Burglars broke into the office of the I. L. Stiles & Son Brick Co., in North Haven, Conn., one of the hot nights in August, and secured considerable personal property of value. The thieves forced in the front door and ransacked the place, evidently in search for money. No money was left in the office, so the intruders took whatever they found handy.

Frank M. O'Brien, senior member of the firm of O'Brien & Co., brick manufacturers, Natchez, Miss., died August 16 of gastritis and cerebro meningitis, aged 47 years. He had been sick since July 2, and for the greater part of that time has been in a semi-conscious condition. He leaves a widow and four children, the eldest of whom is a boy, aged 17 years.

The Newbern Brick Co. is the name of a new concern at Newbern, N. C., organized for the purpose of manufacturing brick. The plant will be put in operation at once, but next spring it will be greatly improved and enlarged. New dryers will be built and additional machinery put in. Mr. Frank Hyman will have charge of the works, which will have a daily capacity of 60,000.

Sheboygan, Wis., was visited by a tornado the middle of August, which did more damage in its ten minutes' stay than can be repaired in that many months. Dwellings, churches and factories of all sorts were demolished in short order. Among the latter was the brickmaking plant of A. Zimball & Son, which was badly wrecked. Besides the damage to the buildings a large number of green brick was ruined.

The brick plant of S. B. Donly, of Washington, Pa., has been purchased by a firm which will be known as the Washington Brick Co., of which O. S. Chalfant is president and James Forsythe, secretary. The present daily output of the plant is 9,500, which will be increased to 20,000. New machinery will be put in and new kilns and dryers built. Mr. Donly, who has for many years been connected with the plant, will be superintendent.

James A. Benner, a pioneer brick manufacturer of Allentown, Pa., died at his home in Eastern Salisbury, Pa., August 31, after an illness of three weeks. Mr. Benner was 56 years old and had been engaged in the brick business nearly all his life. Besides being owner of the Lower Saucon Brick Works, he was a stockholder and director in the South Bethlehem National Bank and a stockholder in the Lehigh Valley Storage Co. Five Children survive him.

The C. W. Raymond Co., of Dayton, Ohio, reports business flourishing as almost never before. Their new dry pans are selling like hot cakes—in fact, this department of their business has been working overtime to fill orders. They have orders for several of their soft mud machines, and those recently placed in operation are giving excellent report of themselves. They have recently shipped a large consignment of stiff mud machinery to Cuba and several to the Pacific coast.

The financial trouble of the Wooster (Ohio) Shale Brick and Clay Co. has been adjusted, the application for a receiver dismissed and the work at the plant resumed. Mr. J. R. Natzger, the treasurer of the concern, states that the financial affairs of the institution are really in much better shape than a year ago, that the indebtedness had been reduced steadily, and that the amount of manufactured stock on the yards ready for market was greater than ever, and when sold would bring in more than enough to pay off every dollar that the company owes.

Mr. William F. Scott, secretary and treasurer of the Fernholtz Brick Machinery Co., St. Louis, Mo., advises us that they have recently booked an order for a complete four-mold machine outfit for Mr. M. Butler, of Austin, Texas. This is Mr. Butler's second order, as he has been using a four-mold outfit on his yard at Houston, Texas, for the past two years. It is quite evident Mr. Butler appreciates a good thing. Among other sales is a complete four-mold outfit to the Montgomery Land Co., Yazoo City, Miss., and a Fernholtz patent clay pulverizer to W. D. & C. H. Le Sueur, Nashville. Tenn.

The large outfit recently placed in operation on the yards of the Western Brick Co., Louisville, Ky., consisting of a 999 brick machine. A1 automatic cutter, compound geared pug mill and 10A special clay separator, manufactured by the C. W. Raymond Co., of Dayton, Ohio, is now in successful operation at from 110,000 to 125,000 per day. It makes perfectly cut square brick at this rate, and is pronounced by all who see it a marvel of rapid brickmaking. By the improved method of handling this large output, designed by the manager of the company, it is conveyed to the dryer with almost no injury. The Standard Dryer is used in connection, doing its work in an admirable manner.

The McAlester Vitrified Brick Co., Muskogee, Ind. Ter., is having trouble in getting material with which to carry on its work. The company has been doing a big business, but its work was brought to a sudden stop by a man who refused to let the company work on his land because he had selected it as his allotment. The brick company uses in the manufacture of its brick shale that has been taken out of the coal mines. The shale was dumped on the land in question, and the owner refuses a rental of $25 per year per acre. The matter has been brought before Indian Agent J. Blair Shoenfelt, of this place, but he held that he had no jurisdiction in the matter, and the case will have to be disposed of in the United States Court at South McAlester.

Amos Dotterer, one of the oldest brick manufacturers in Philadelphia, and a widely known resident of the southern section of the city, died suddenly September 3 at his country residence in Wayne of general debility. He had been out driving a day or two before, and, while not in the best of health, appeared to be regaining strength and vigor. On his return he was seized with a fainting spell, from which he failed to rally. He was born near Reading sixty-two years ago, and at the age of 16 years came alone to Philadelphia to seek employment. By industry and thrift he enabled himself to start in the retail grocery business, in which he remained nine years. He then started in the manufacture of bricks, beginning in a small way, and increasing his business until his plant, at Point Breeze avenue and Morris street, became one of the largest in the city. Among the large buildings for which Mr. Dotterer supplied the bricks were the City Hall and the Bourse. He was actively engaged in the brick business since 1867. Four children, two sons and two daughters, and eight grandchildren survive him.

THE WORLD IS OURS.

The American Gets the Highest Award at Paris.

Merit Wins The World Over.

The World's Greatest Factories Give up the Pennant to the

"Machinery That Never Disappoints."

The "Built Right Run Right" Line of Machinery Gets the Laurel Wreath at Home and Abroad.

IT'S ANOTHER evidence that MERIT WINS. A cablegram from Paris announces that the machinery of the American Clay-Working Machinery Company, at the Paris Exposition, has been given the highest award, together with a medal. This places the "BUILT RIGHT RUN RIGHT" line the leaders in all the world. The manufacturers of both continents competed side by side, but the machinery built on merit, of faultless material and by competent workmen, won the prize. Clay manufacturers of the United States have long known that the American line of machinery was without an equal in this country, and now that the lines of other nations have been beaten the American stands "THE PEER OF THE WORLD." It is no surprise to the American Company that the Jury of Awards should decide in favor of the American Clay-Working Machinery Co. It is merely another instance of merit winning a deserved tribute. The advanced ideas on which these machines are built, the high grade of material used in their construction, the exacting care and faultlessness of the workmanship combined to place these machines in the front rank of excellence. There is an added satisfaction in the fact that the machines in this exhibit were the same as are being shipped every day. There was no gold paint or holiday effect. The original exhibit intended for the Paris Exposition, was lost at sea, and a duplicate exhibit was necessary. So short was the time that regular machines had to be taken off the floor of the erecting room without any extra work being done upon them.

Users of the American Company machinery have the satisfaction of knowing that they are using today the same machines which were given the highest award at the Paris Exposition. If you are in the market for machinery, why not get the best, "THE PICK OF THE WORLD?" Our Paris Prize line includes Dry Press, Stiff Mud and Soft Mud Machinery. IT'S BUILT RIGHT AND RUNS RIGHT."

SEND FOR CATALOGUE AND PARTICULARS.

The American Clay-Working Machinery Company,

NEW YORK OFFICE:
39-41 Cortlandt Street.

BUCYRUS, OHIO, U. S. A.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

THE BRICKMAKING SEASON of this year is drawing to a close. Not because the brick will not dry for lack of sunshine or on account of excessive rainfall, or on account of the lateness of the year, but simply because the call for brick is slow, and prices will not warrant any one sending brick to market who can possibly afford to hold what stock is made. The man who owns his own yards is not bound by contract to make a certain number, but the man who has a leased yard is under obligations to make a certain number or pay for them. In the latter case, the question is, would it not be better to pay for what he does not make than to keep making and sending them to market at a loss?

Hope, which springs eternal in the human breast, bids us hope for some improvement in prices, but the statistics of the trade shows no silver lining to the clouds that seem to be hovering over the Hudson River brickmakers. Since the 1st of July, one or more yards has stopped molding each week. On the 17th of July the manufacturers agreed to a curtailment of output, and it was expected that by the first of August there would be some improvement in prices. Like other expectations in the brick trade it has thus far been an irredescent dream.

—A Retrospect.—

In May, Up-Rivers were quoted as low as $3.87½, and top rate, $4.50, with fifty-two barges arrived for the week and sales of fifty-two, and thirty-two barges left in market. First week in June shows $3.75 and $4.50 as special, with the arrival of forty-four barges and a sale of fifty-four, leaving twenty-two on market. Week of June 4 shows a fall in prices that seems to have been the one to rule. Haverstraw as low as $3.87½. Special, $4.50; lowest, $3.75, with the arrival of fifty-six barges and fifty-nine barges sold, leaving nineteen on market. The next week the rates were the same, with arrival of sixty-seven barges, and a sale of seventy, and sixteen left on the market.

The same prices prevailed throughout July. The first week there arrived fifty-nine barges, fifty-eight were sold, eighteen being left. The second week sixty-nine barges arrived on the market, seventy-four were sold, and thirteen left. The third week, fifty-five barges arrived, fifty were sold and eighteen remained on market. The fourth and last week forty-eight barges arrived, sixty were sold, leaving but six on the market. As the reduction came within the last two weeks, the market was in no way scared to a higher price, and the shipper seemed to want to get rid of his stock before the expected raise came. August was just a repetition of the previous month, the sales and arrivals averaging about the same, but seventeen barges were left on market. The price is about the same.

—Stock on Hand.—

If an invoice were taken, it would be found that the sheds were filled up to their capacity in the majority of cases. Judging from past experiences, there will be enough brick on hand at the first of the year to last until new stock is put on the market. The prospect of improvement is not very bright at present. It is just four months until 1901 will make its appearance. The permits that will be issued during those four months will not be used until next year, and not many new jobs will be started this fall.

It has been most discouraging to look at the record of building permits from week to week. From January 1, 1899, to August 24 of same year, 3,082 building permits were issued. From January 1, 1900, to August 24, of same year, but 1,222 permits were issued, not even half so many as the previous year. What is the cause? Some one suggests that presidential year is responsible. I am inclined to think not. As in the past, trade has been affected, but not to the extent the above figures would indicate. It is not because money is scarce, for such is not the case. We shall have to look for some other cause.

The only visible one to those who use their eyes and are honest enough to admit the truth of what they see, is overbuilding, more especially speculative building. Chicago has not recovered from the building of so many houses to meet the wants of the people expected to occupy them. Just so with New York City, especially in the upper section. The people who were expected to fill them have not yet made their appearance and it will take time for them to come, after that the demand for a year or so will make a little boom for the trade.

—The Coming Brickmakers—

will have to face conditions similar to that faced by the men of the previous generation. They will have to pay close attention to the needs of the yard and make each dollar count, being economical in all things and not incur obligations that will cause trouble to meet.

If by chance one visits a mill or manufacturing establishment, it will be noticed that everything is in use, and there will be found no accumulation of old stuff around the outside of the buildings, everything will be clean, as though a methodical man was in charge. It is not the overlooking of small things that makes a man rich, but the attending to the minor matters that causes the bank account to grow. Some one will say, "How can I run my yard any closer than I do? I use only as many men as is absolutely necessary." It is not all in the doing of so much work with so many men, or paying low wages. It is in the kind of men you employ. Do not hire a man because he is a regular brickyarder, and is able to do anything about a brickyard and will work for low wages. Better hire a man who demands good pay, even though he does not know much about brickmaking and has to be taught how to do things. He will be more willing to push ahead and advance the interest of his employer than the old brickyard man who gets but poor pay. A slight advance in wages will often prove most economical in the long run. On the other hand, you should not take on a man who knows nothing about the yard, but will work for very low wages. You will lose money whenever you hire a cheap man.

One should also be careful in the selection of the men who have to drive the horses. It is poor economy to hire a man who knows nothing about the care of horses or how to handle them just because he is cheap. I refer more especially, of course, to the yards where the clay is hauled to yard by horse and cart, and the ones where tempering pits are used. There are many other places on a brickyard where economy might be practiced.

—The Brick Market—

is one that does not suit the seller, and probably not the buyer, for the latter knows that if he squeezed a little harder he could buy for less, but it wouldn't pay. It might bring on a state of affairs that would turn it in the seller's power. Br'er Rabbit, he lay low—he knows a thing or two. If some of the sellers had the business ability that the buyers have, there would be a perceptible change in short order. It is not possible to effect such a change, so the same state of affairs still prevails.

For the week of August 16, eighteen barges were on the market from the preceding week, fifty arrived during the week, and fifty-one were sold, leaving seventeen barges on the market.

—Prices.—

Haverstraws, $3.87½ at $4.25 at $4.50, special.
Newburgh Bay, $3.87½ at $4.25, at $4.50, special.
Up-Rivers, $3.75, at $4.25.
Hackensack, none on the market.
Pale, $1.75, at $2.00.

A. N. OLDTIMER.

Hackensack, N. J., September 1.

THAT LUCKY FOURTH LEAF.

One leaf is for hope, and one for faith,
And one is for love, you know;
And God put another one in for luck,
If you search you will find where they grow.

—Emily Dickinson.

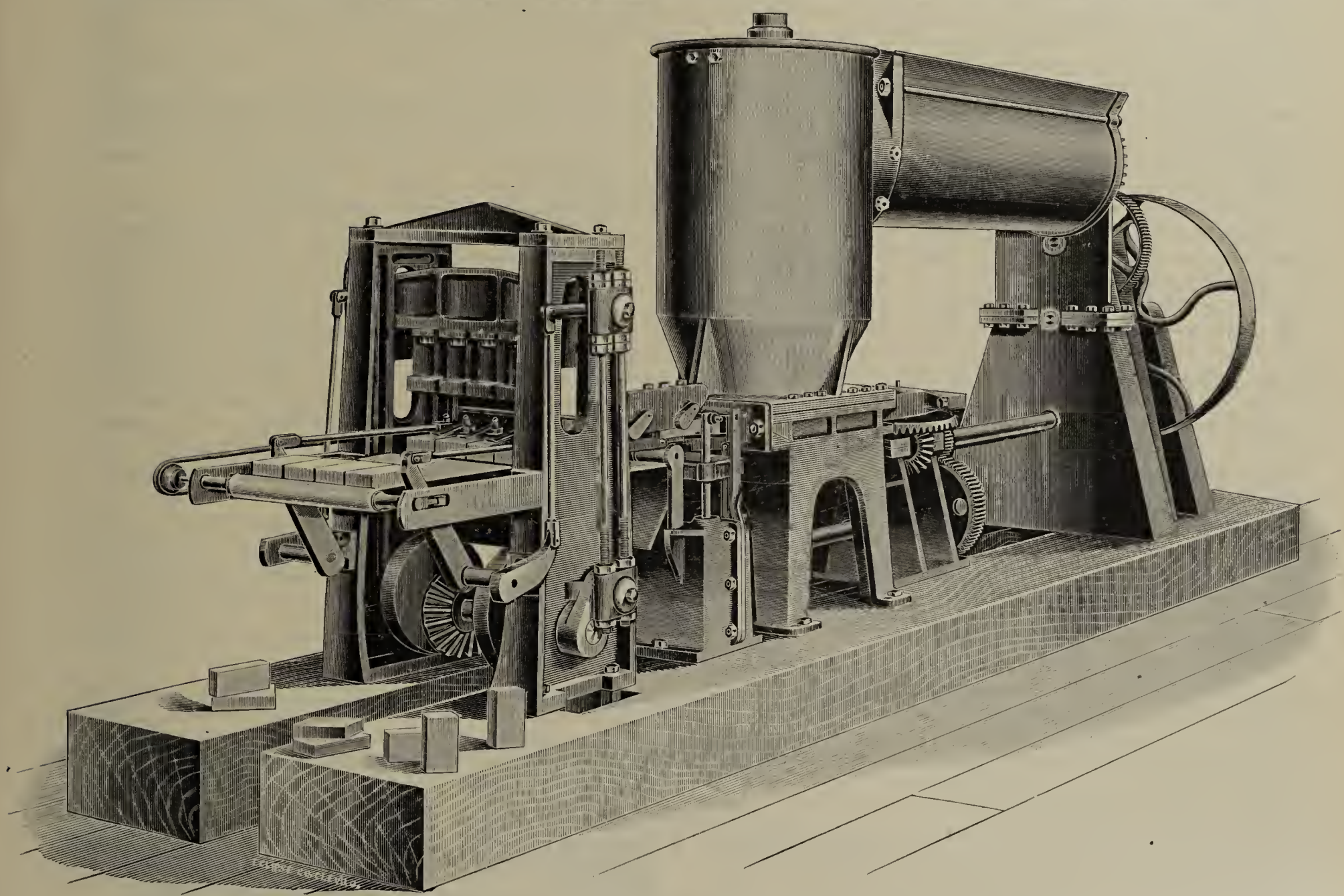
A Perfect Brick Machine.

STRONG, POWERFUL, SIMPLE and POSITIVE.

Absolutely Unbreakable. **Less Working Parts than any other Machine.**
Without Repressing Attachment.

The DICTATOR BRICK MACHINE will take the Clay or Shale as it comes from the bank or Dry Pan and automatically produce perfect repressed brick.

NO LAMINATION.



DICTATOR BRICK MACHINE. Capacity 40,000 Perfect Repressed Brick per day.

The only machine in the World, that will Automatically produce perfect Repressed Brick.

The Battenfeld Mfg. Co.,

Write for Catalogue. *922 Garfield Bldg, CLEVELAND, OHIO.*

WRITTEN FOR THE CLAY-WORKER.

PACIFIC COAST NEWS.

TERRA COTTA and brick business is a little slow again this month, partly owing to the strike of the mill hands. This is injuring trade more or less, inasmuch as building is retarded to a great extent. The mill hands of the different mills are holding out for an eight-hour movement instead of nine hours, which has heretofore been the extent of a day's work. The terra cotta dealers cannot deliver material because contractors are unable to go on with woodwork in buildings. The trade hopes to see this matter settled soon, because it means a loss to the clayworking interests as well as other lines of business.

The Steiger Terra Cotta and Pottery Works will put a terra cotta front on the Deming estate building, which will soon be erected on Turk street, near Market street. Excavations for the same have already been made.

Gladding, McBean & Co. report a slack month, in which very little is going on. Minor work forms the principal source of revenue at present.

Work on the new tile works being put up at Tropico, Los Angeles county, California, is progressing. It is to be a substantial brick building, and the first installment of machinery for the factory was shipped from the East the first part of last month. As soon as the building is completed the manufacture of tiles for the market will begin. The total cost of the factory will be about $20,000 less than it would be for a similar building in the East, because expensive heating apparatus will not have to be provided, and it will not be necessary to have the water pipes covered to protect them against frost. Colonel Griffith, the president of the company, is pleased with the progress made and the thoroughness of the work done. Mr. Kirkham, the general manager of the company, is superintending the construction of the building.

The California Portland Cement Company has purchased 100 acres of land at Perris, Cal., which contains a fine deposit of clay.

The old Benicia pottery building, at Benicia, Cal., was destroyed by fire last month. The building contained considerable stock, such as patterns, molds, tools, etc., which was valued at $3,500, and insured for only $1,100.

Spokane, Wash., is to have a new industry in a short time. W. H. Reid and G. H. Dietrich have formed a company for the making of street and floor tiling. and expect to be filling orders ere long. This is to be the only firm manufacturing street tiling and floor tiling in eastern Washington, and they expect to supply the entire eastern part of the State. The company, which is to be known under the firm name of Reid & Co., has leased two lots from the Columbia Investment Company, on the corner of Boone and Division streets, Spokane, and will start men at work immediately erecting a frame building 30x70 feet. The molds and machinery are all on the ground, having been shipped from the East some time ago. The company will also manufacture graniteized and marbleized tiling for ornamental purposes. In front of their establishment the company intends to put in some fancy walk as a sample of their work. Mr. Reid claims his company has plenty of capital back of it, and will extend its industry as the trade demands it.

William Fortner is burning a kiln of brick at Copperopolis, Cal., which is to be used in making improvements at the Union copper mines.

The brickyard at the penitentiary at Walla Walla, Wash., presents a busy scene. The convicts have been put to work preparing for the manufacture of 350,000 brick, which will be used for the new addition to the east wing of the penitentiary. Clay is being obtained from the clay banks near Dixie and hauled to the brickyard. As soon as the first lot is burned work will be commenced on the erection of the addition. The building is to be a gift of the government, and will cost $18,807.

The Simons Brick Company, of Pasadena, Cal., reports the sale of 250,000 repressed stock brick for face work, and 700,000 common brick, to be used in a new Catholic church to be erected on Twelfth and Los Angeles streets, Los Angeles, Cal. Also all the brick necessary to construct the new Methodist church and the Throop addition in Pasadena. Their plants are running at full capacity.

Two carloads of pressed brick are being shipped each day from Alhambra, Ariz., to Prescott, which are being used in the rebuilding of that city.

Work has been begun on the ground recently acquired by New York capitalists at South Seattle, Wash., and which is to be used by them as a brickmaking plant. It is understood that John Gurley, well known in and about Seattle, is to be manager for the company. It is not known just what will be the capacity of this new plant, but it is said it will not be under 12,000,000 per year. This will be a plant as large as the Seattle Brick and Tile Company, which is also located at Seattle.

J. C. Hutchinson, of Great Falls, Mont., has acquired an interest in the Spokane Brick and Lime Company, 328 Main avenue, Spokane, Wash., and has assumed active management of the business.

The Riverside Press Brick Company, of Riverside, Cal., started up its new machinery August 13. It is the intention to make 20,000 bricks per day, and they have drying ground and shelving enough to accommodate 100,000 brick. Every fourth day the bricks that are four days drying will be placed in the kiln and the rotation process continued until the kiln of a half million bricks is ready for burning. Although the company intends to turn out but 20,000 brick per day, the plant has a capacity of twice that many, if it should be found necessary to make use of it. It requires thirteen men to operate the plant, and a span of horses will be used in bringing the clay from the pit to the mill. The plant is operated by electric power, a twenty-horse power motor being used.

The Holt & Gregg Company is preparing to install a second patent kiln at its works near Kennet, Cal. The company expects to have the new kiln in operation by the middle of this month. The kiln being installed will have the same capacity as the one in operation—six tons a day. Mr. Gregg says that owing to increased business the firm could not keep up to the demand with one kiln.

The Puget Sound Brick Company has bought a brickyard site formerly known as the Burrows brickyard, at Kent, Wash., and have established a steam plant, with a capacity of 24,000 bricks per day. The new plant is now in operation.

San Francisco, September 5.

COULD USE IT.

"Nay, Faun, thou art but half a man! My bric-a-brac will be no use to thee!"

"Not so, friend! At times, my man-half is very thirsty, and I will use thy bric-a brac for a growler."

LEVIATHAN "It's a Brick,"

....EITHER FOR....

Transmission or Conveying,

And why it is in such general use among CLAYWORKERS, is that it may be run with less tension than other belts, does not slip; may be subjected to the most excessive weather conditions without injury, and as a result,

Outlasts From Two to Five Rubber Belts.

MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.

55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.

Write for Samples and Price List.

BOOKS FOR BRICKMAKERS.

"CLAY GLAZES AND ENAMELS," Henry R. Griffen, C. E. $ 5.00
"BRICKMAKER'S MANUAL," Morrison and Reep, 3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr., 2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley, 1.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M., 1.00
"PRACTICAL FARM DRAINAGE," J. J. W. Billingsley, 1.00
"TRANSACTIONS OF THE AMERICAN CERAMIC SOCIETY" - - - - - 1 00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

Anglo=American Pottery.

Old English China with American Views.

A MANUAL FOR COLLECTORS, BY

DR. EDWIN ATLEE BARBER, A. M., Ph. D.

Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

The price is $1.60 per copy, postage prepaid.

T. A. RANDALL & CO.,
The Clay-Worker.
INDIANAPOLIS, IND.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED—The machinery for a complete paving and building brick and dry press brick plant. O. KUTSCHE,
9 1 c 932 Front Ave., Buffalo, N. Y.

FOR SALE—One No. 0 Gates' crusher, in good repair; used only a short time; a good stone crusher cheap. Address,
9 1 d R. WING, care Clay-Worker.

WANTED—Position as superintendent or head burner of building brick plant; understand both the plastic and dry-press processes; best of references. Address,
9 1 c NEBRASKA, care Clay-Worker.

WANTED—Position as manager of dry press brick works, or as burner of any kind of brick; no salary required until proof of ability is given. Address
1 c D. M., care Clay-Worker.

WANTED—Position as superintendent of either dry press or plastic brick plant, by one who is thoroughly practical and up-to-date in every department of same. Al references given. Address,
9 1 d P. W. G., care Clay-Worker.

WANTED—By Oct. 1, position by practical brickyard superintendent; understands making and burning stiff or soft mud or dry press brick; best of references given. Address,
9 1 c SOUTH, care Clay-Worker.

"CORRESPONDENCE SOLICITED with Eastern or Western brickyard; manufacture new kind German perforated radial chimney bricks, for high chimneys."
LOUIS FORT, C. E.,
9 3 c 312 E. Thirteenth St., N. Y. city.

FOR SALE—Cheap, Freese Brick and Tile Machine, 20,000 capacity brick, 10,000 capacity three-inch tile; pug mill and cut-off table. Plant complete except power. All machinery in good shape ready to run. Address
9 1 d HUGH, care Clay-Worker.

FOR SALE—One three-mold Andrus dry press; in good condition; would not be sold but for the fact we no longer make dry press brick; cheap for cash or on time to responsible parties.
COALDALE PAVING BRICK CO.,
9 tf r Birmingham, Ala.

WANTED—A situation by a thoroughly practical and reliable brickmaker; will take superintendency of plant or foremanship of yard or burning crew; best of references as to ability and character; no bad habits; permanent situation wanted. Address,
9 1 ? GEO. BRETON, care Clay-Worker.

WANTED—Competent, experienced foreman for sixteen-kiln sewer-pipe plant in City of Mexico; man must be thoroughly acquainted with all departments of sewer-pipe and fire-brick manufacture, familiar with machinery, capable of handling men and have first-class recommendations. Address, MEXICAN CLAY MFG. CO.,
9 1 d 39 Cortlandt St., New York.

FOR SALE—A RARE CHANCE.

Complete equipment for 12 track Standard Drier, 125 feet long, of heaviest pipe, including 14,000 six brick pallets, 204 steel cars for soft mud brick, etc, etc. All used but little and most practically good: s new. Also one Simpson Dry Press Machine. Will sell separately. Address E. G. A., care Clay-Worker.

FOR SALE.

An interest in one of the best Brick Plants in the Southwest.

Everything new and up-to-date. Stiff Mud Machine, Automatic Cutter, 50 H. P. Engine, Dryers, etc.

Only machine yard in city. Plenty of building and large demand for brick.

This proposition is worth investigating.
Address A. B. C.,
9 1 c Care Clay-Worker.

FOR SALE—Dry press brick machine of Standard make. Good condition. At a bargain. 20,000 brick per day.
UNITED STATES BRICK-PRESS CO.,
9 1 c Erie, Pa.

FOR SALE—Seventy double-deck dryer cars, two transfer cars and two turntables, rails, etc. Address
8 2 c 12 SCHMIDT, care Clay-Worker.

FOR SALE—Cheap, one intermediate wonder brick machine, which we purchased new from the manufacturers in 1898, and have used about six weeks.
LUDOWICI ROOFING TILE CO.,
8 tf d 508 Chamber of Commerce, Chicago.

WANTED — Situation as superintendent or burner of dry pressed plant by thoroughly competent man; hustler and economist; can furnish excellent reference as to habits, ability, etc. Address.
8 2 d ENTERPRISE, care Clay-Worker.

FOR SALE—A good paying brick and tile plant, located in Central Iowa. All machinery, kilns, sheds, etc., in first-class running order. Good market for entire output. Satisfactory reasons given for selling. Address GOOD BARGAIN,
8 tf d Care Clay-Worker.

A WELL EDUCATED German engineer and chemist will undertake the construction of any size cement works. Many years experience and thorough knowledge of the business in all its details. Address EMIL MULLER,
6 1 5 p 18 Paula St., Havana, Cuba.

WANTED — Situation as superintendent of building brick plant. Have had several years' experience with Chambers' machine, steam shovel, etc. Can give best of reference. A permanet position more important than salary. Understand the management of men. For other particulars address.
6 tf d r MR. PUSH, care Clay-Worker

FOR SALE.

One 8 foot wet pan, wood frame.
Two 9-foot dry pans, wood frame.
One 9-foot dry pan, iron frame.
One stiff clay auger machine.
THE T. B. TOWNSEND BRICK & CONTRACTING CO.,
9 tf d Zanesville, O.

FOR SALE OR RENT.

A brickyard at Macomb, Ill.; have a good brick machine, with capacity of 30,000 a day, and a good down-draft kiln, of 200,000 capacity. The Western Illinois State Normal School has just been located here, and contract to be let this fall. Macomb has a population of 6,000. Address,
9 1 c ALBERT EADS, Macomb, Ill.

CONTINUOUS KILN PLANS.

TEN DOLLARS will buy blue prints and full specifications for building and operating the best and cheapest continuous kiln for common brick; capacity, 20,000 per day; cost, $2,000; open top; mechanical draft; will burn 90 per cent. hard brick and save its cost in fuel in two years. Write for particulars. WM. M. IRWIN,
2525 S. Fifteenth St., St. Joseph, Mo.

BARGAINS IN SECOND-HAND MACHINES.

One second-hand Simpson 4-mould brick press.

One 9x15 rock crusher.

One second-hand winding drum, with pulleys and cable complete.

One lot of contractors' dump cars and 25 horse-power engine and boiler, with all fixtures. Address,
HENRY MARTIN BRICK MACHINE MFG. CO., Lancaster, Pa.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

For Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan Bark, Cinders, Ores, Sawdust, Lime, Cement, etc. Also continuous Pan Conveyors.

Iowa Pipe and Tile Co, Des Moines, Iowa.
Borden & Selleck Co, Chicago:
Gentlemen—We have used the Harrison Conveyor for the past two years. It takes about ninety tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours truly, IOWA PIPE & TILE CO.

BORDEN & SELLECK CO., Mfrs. and Sole Agents, **48 & 50 Lake St., Chicago.**

Send for Illustrated Catalogue.

MORRISON'S LATEST IMPROVED KILN

For Burning Building Brick.

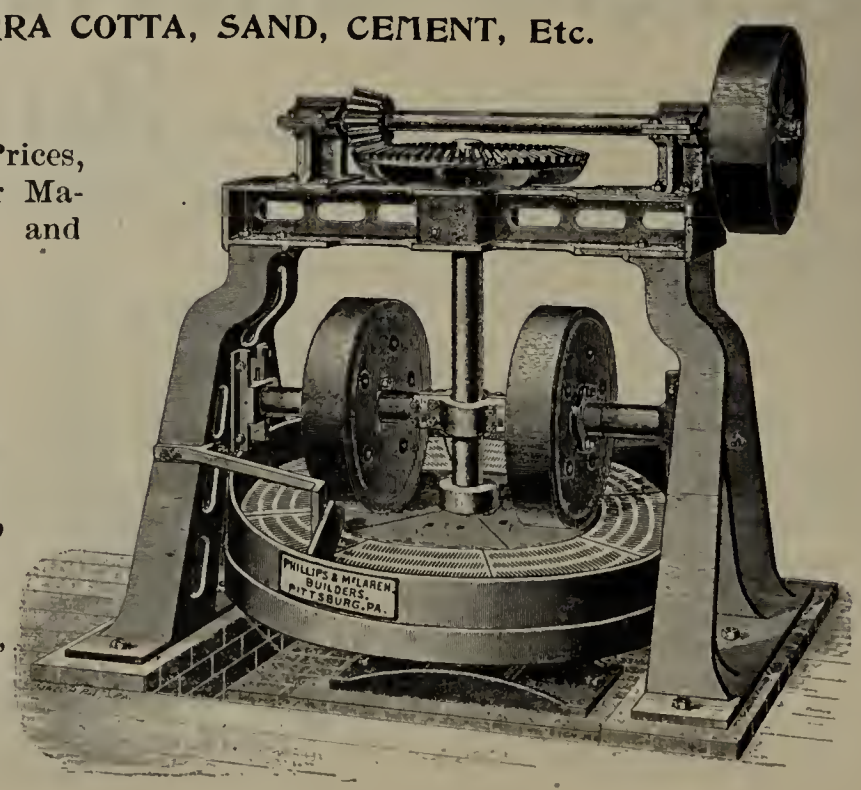
It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object. Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,
P. O. Box 335, Rome, Ga., U. S. A.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.



Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

Drying Economy.

Our Dryer is superior to others by reason of improved methods, low cost of construction and economy of operation. If you're interested in dryers write for particulars. Ours will prove a good investment.

We also manufacture Conveyors, Exhausters, Heaters, Fans, Engines and Mechanical Draft Apparatus.

THE NEW YORK BLOWER CO.,
Bucyrus, Ohio.

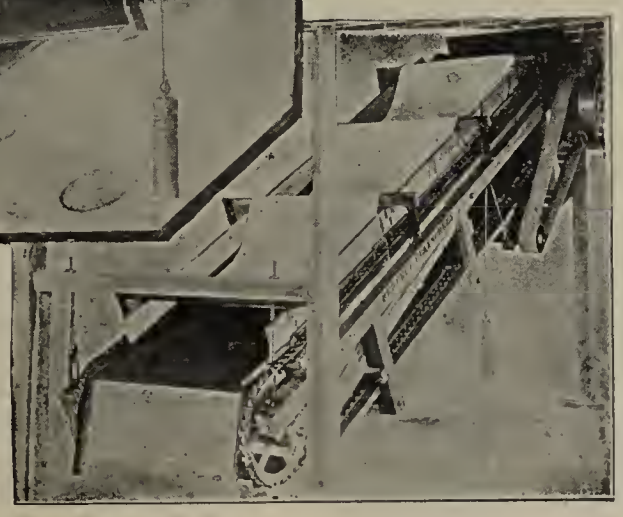
NEW YORK OFFICE
39-41 Cortlandt St., New York, N. Y.
BOSTON OFFICE:
185 Summer St., Boston, Mass.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush.

HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE—One-half of 160 acres; valuable improvements; inexhaustible supplies; unlimited sales of valuable material in the land; profits very large; two hours from New York City; many daily trains. Want good partner with financial abilty to ship $60,000 worth now annually, and enlarge future sales. Address
8 2 c A. S. L. O., care Clay-Worker.

WANTED—A situation as superintendent or foreman of terra cotta, tile or pressed brick plant. Understand all the details of making and burning porous terra cotta. Also the construction of kilns of all sorts. Satisfied with moderate salary if the situation is permanent. Best of references. Address
8 tf tr MILFORD, care Clay-Worker.

FOR SALE—Big Wonder brick machine, with iron pug mill, fitted for the manufacture of either side cut or end cut brick; also, one Columbia single die repress, all in first-class condition. Reason for selling, no clay at our plant suitable for the machine. For further particulars address LEXINGTON BRICK CO.,
7 tf d Lexington, Ky.

BRICK MACHINERY FOR SALE.

We have purchased the entire equipment of a large St. Louis brickyard and have for sale one six-mold Ross Keller dry press, one two-mold Whitaker press, engines, boilers, pumps, disintegrators, wheel scrapers, cars, kiln doors and frames, grates, etc.; also, a large lot of miscellaneous machinery, shafting, pulleys, hangers, belting, elevators, etc. Will sell whole or in parts to suit.
SCHOELLHORN-ALBRECHT MACHINE CO., St. Louis, Mo. 8 tf d

FOR SALE.

One Iron Standard Steam Power Machine, with pug-mill attached.
One Anderson Brick Machine, with 12-foot Pug Mill.
One new Brewer Crusher; one second-hand Brewer Crusher.
One Carnell Repress.
One Penfield Soft Mud Machine.
One 40-h. p. Boiler and Engine.
One Monarch Machine, used two summer seasons; in excellent repair.
THE HORTON MFG. CO.,
8 1 1 Painesville, Ohio.

BARGAINS—FOR SALE:

Several second-hand brick machines, steam power.
One second-hand horse-power brick machine.
One second-hand mould sander, almost new.
One second-hand 25-horse-power engine, in perfect order.
One second-hand 25-horse-power boiler.
One wire cut brick machine complete with die.
One dry pan, new.
HENRY MARTIN BRICK MACHINE MFG. CO., Lancaster, Pa. 7 tf L

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.
PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.
SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH.
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 4 tf d

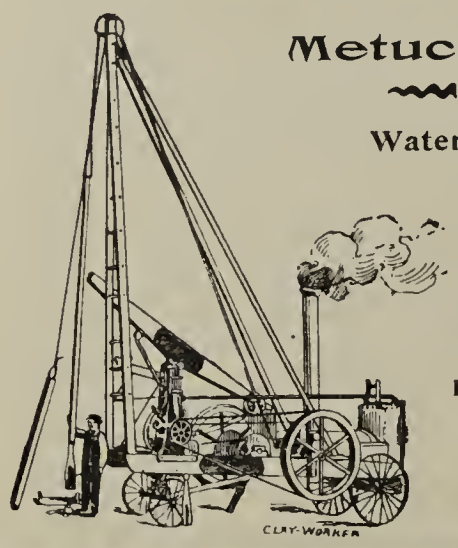
$6.95 to $99.75

At from $6.95 for a 100-pound house safe to $99.75 for a very large double outside and double inside door bank or public office safe, we sell the HIGHEST GRADE FIRE-PROOF COMBINATION LOCK SAFES MADE, letter your own or firm name on, and ship to anyone any place in the United States, payable after received. For $23.95 we sell a good size safe for any store, office, factory, shop or hotel. We will save you more than one-half in price. For full particulars, special safe catalogue, special pay-after-received offer, etc., cut this notice out and mail to us. SEARS, ROEBUCK & CO., CHICAGO.

W. R. Osborne,

Metuchen, N. J.

Water Wells, Tanks, Pumps, Etc.

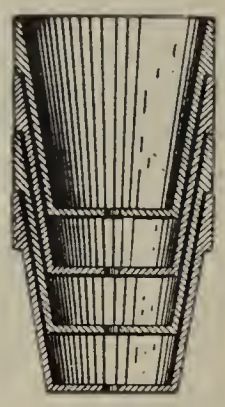


LOW PRICES

Economy of Fuel and Large Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.
Hot air dryer. Continuous and Muffle Kiln

ALFRED YATES,
JOHNSONBURG, PENN



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

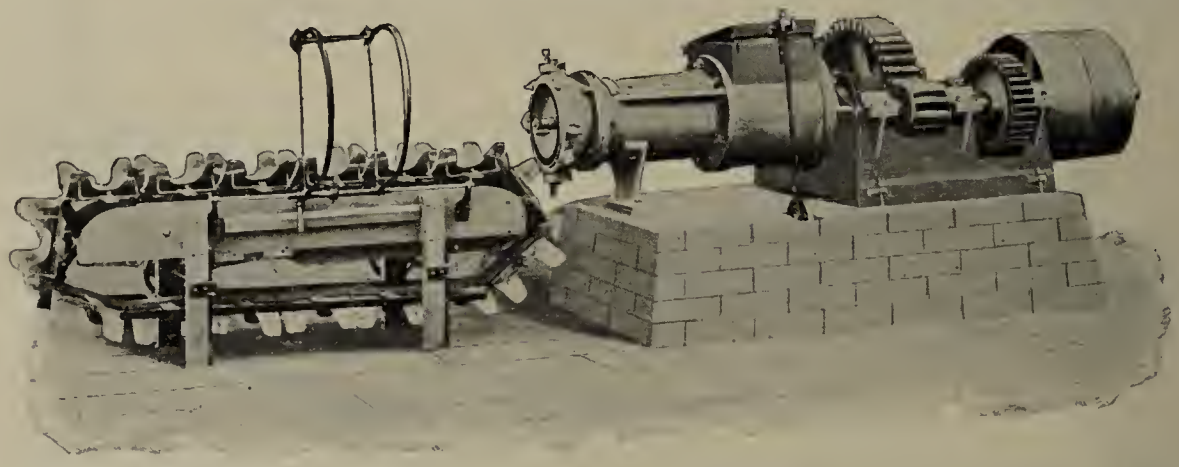
No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
78 South Pennsylvania St., INDIANAPOLIS, IND.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.
Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.
Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,
Detroit, Mich., U. S. A.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

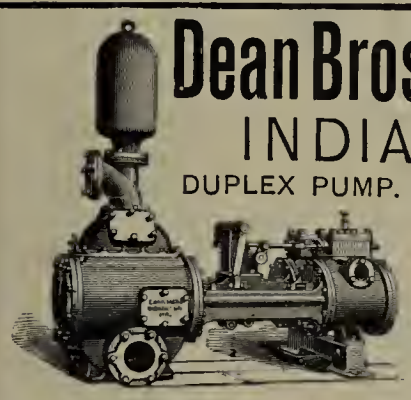
Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Dean Bros.' Steam Pump Works

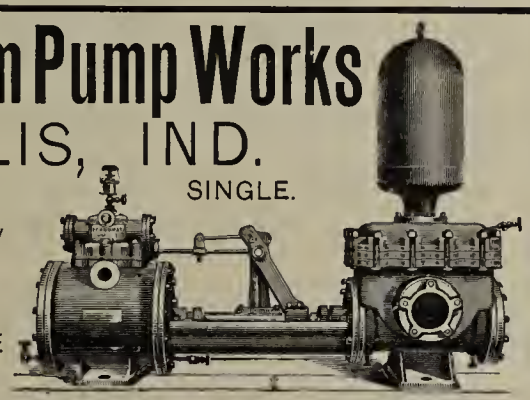
INDIANAPOLIS, IND.

DUPLEX PUMP. SINGLE.



PUMPING MACHINERY FOR ALL PURPOSES.

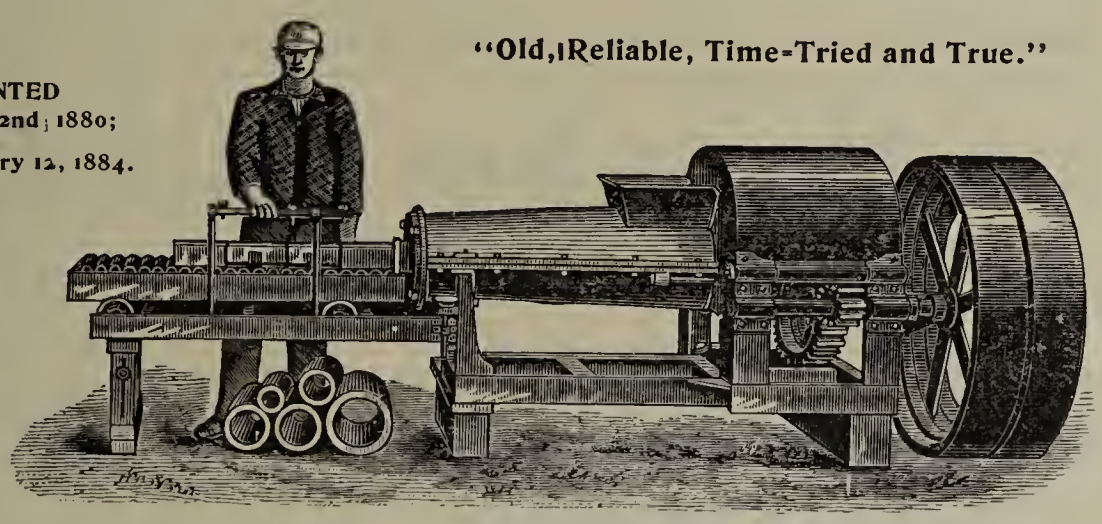
SEND FOR CATALOGUE AND PRICES.



KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd, 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of WELLS & HALL,
Successors to WESTBROOK & WELLS,
Ogdensburg, N. Y.

VanDuzen's STEAM JET Pumps.

Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

GABRIEL & SCHALL

P. O. Box 2654. **205 Pearl Street.**

NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. **Carbonate of Barytes**

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

LE CHATELIER'S

PYROMETER

For measuring temperatures between 0 and 1600° Celsius, equal to 2920° Fahrenheit.

RECOMMENDED BY THE HIGHEST AUTHORITIES, and

Successfully used in establishments for the manufacture of

BRICKS, TILE, TERRA COTTA, STONE WARE, PORCELAIN, IN POTTERIES AND ALL CLAY WORKING INDUSTRIES, as well as

IRON AND STEEL AND ALL OTHER METALS,

Gas, Chamotte,
Glass, Chemicals,
Sugar, Cement,
Accumulators, Incandescent Lamps,
Cartridges and Ammunition.

Also by Boiler Inspectors, Schools and Colleges and for **Hardening and Annealing Steel in Roll Foundries, Etc.**

CONSTRUCTED BY

W. C. HERAEUS, Platinum Works,
Hanau, Germany.

Prices and Descriptive Pamphlet on Application.

REPRESENTATIVE:

CHARLES ENGELHARD,
41 Cortlandt Street, New York, N. Y.

Have you thought About your Cuts for your NEXT CATALOGUE?

We Make 'em Right

INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.
INDIANAPOLIS, IND.

The VANDALIA LINE

The Short Line for St Louis and the West.

Leave Indianapolis.		Arrive at Terre Haute.	Arrive St. Louis
No. 15	7:25 am,	9:55 am	5:00 pm
No. 5	6:45 am	8:35 am	12:56 pm
No. 21	12:15 pm	2:05 pm	6:40 pm
No. 7	3:30 pm	5:10 pm	9:40 pm
No. 11	7:05 pm	9:00 pm	1:44 am
No. 19	11:20 pm	1:50 am	7:12 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No. 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.

All trains carry first-class coaches.
12:15 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.
Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent,
E. A. FORD, G. P. A. Indianapolis, Ind.

A Perfect Pen

AT A POPULAR PRICE, AND THE BEST PEN AT ANY PRICE

YOUR CHOICE OF THESE

$3.00

Laughlin Fountain Pens

FOR ONLY

$1.00

Try it a Week! If not suited, we buy it back and offer you $1.10 for it.

A Profitable Proposition any way you figure it. Don't miss this opportunity of a life time to secure the best pen made. Hard rubber reservoir holder in four simple parts. **Finest quality diamond point 14k gold pen, and the only positively perfect ink feeding device known to the science of fountain pen making.**

"A gift of never ending usefulness and a constant pleasant reminder of the giver."

☞ Any desired flexibility in fine, medium or stub.

One Pen Only to One Address on this SPECIAL SEED-TIME SALE.

By mail, postpaid, upon receipt of $1. If you desire pen sent by registered mail send 10 cents additional.

Ask your dealer to show you *this* pen. If he has not or won't get it for you, send his name and you order to us, and receive *free of charge* one of our Safety Pocket Pen Holders

Address

LAUGHLIN MFG. CO.,
Laughlin Block,
DETROIT, MICH.

PATENTS GUARANTEED

Our fee returned if we fail. Any one sending sketch and description of any invention will promptly receive our opinion free concerning the patentability of same. "How to obtain a patent" sent upon request. Patents secured through us advertised for sale at our expense.

Patents taken out through us receive *special notice*, without charge, in THE PATENT RECORD, an illustrated and widely circulated journal, consulted by Manufacturers and Investors.

Send for sample copy **FREE.** Address,

VICTOR J. EVANS & CO.,
(Patent Attorneys,)
Evans Building, - WASHINGTON, D. C.

R·I·P·A·N·S

A gentleman residing in Oregon, Wis., recently said: "For a long time I was troubled with dyspepsia. Having considerable hard work to do, if I followed the cravings of my appetite it was sure to result in those horrible distressing pains of the stomach. When in the most agony I would endeavor to obtain partial relief by some 'grandmother' treatment, which, if of any benefit, was to strengthen the imagination that the distress was a trifle less. At times I suffered intensely. It was while visiting my sister Cora that I was recommended to try Ripans Tabules, which I soon discovered were a blessing. I am never without them now, and I recommend them as a God-send to those troubled with dyspepsia."

WANTED:—A case of bad health that R·I·P·A·N·S will not benefit. They banish pain and prolong life. One gives relief. Note the word R·I·P·A·N·S on the package and accept no substitute. R·I·P·A·N·S, 10 for 5 cents, may be had at any drug store. Ten samples and one thousand testimonials will be mailed to any address for 5 cents, forwarded to the Ripans Chemical Co., No. 10 Spruce St., New York.

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

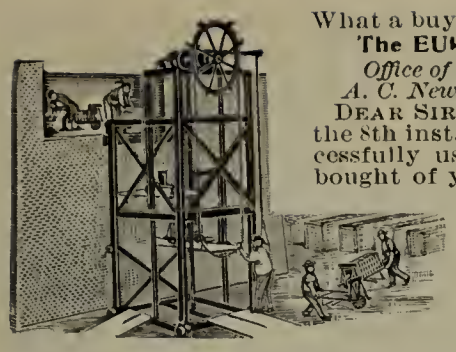
We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also ***Decks for Dry Cars.***

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

W. B. MERSHON & CO.,
Saginaw. East Side Mich.



What a buyer in 1890 says to-day of
The EUREKA BRICK ELEVATOR

Office of the Buffalo Brick Association,
A. C. Newton, Patentee, Cresent, N. Y.

DEAR SIR—Replying to your inquiry of the 8th inst., this Association is still successfully using the two brick elevators bought of you in 1890. They are useful and practical machines, and the long and hard use of them by us shows that they are constructed in a very serviceable manner.

Very truly yours,
The Buffalo Brick Asso.
O. W. WAGER, Mgr

Write for particulars.

A. C. NEWTON, Manufacturer, Crescent, N. Y.

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels, Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., Western Ave, 17th-18th St. CHICAGO, ILL.

Our new Catalogue No. 25 (380 pages), will be sent upon application.

TILE ELEVATOR.

The Jeffrey Manufacturing Co.,

Columbus, Ohio, U. S. A.

ELEVATING--CONVEYING MACHINERY.

CONVEYORS FOR HANDLING
Green Tile,
Brick,
Sewer Pipe,
And Packages of all Description.

Chains, Standard and Special,
Sprocket Wheels,
Elevator Buckets. Elevator Boots,
Shafting, Cable Conveyors,
Hangers, Apron Conveyors,
Pulleys, Spiral Conveyors.

We make Elevators, Conveyors, Carriers, Power Transmission Machinery and all sorts of Labor Saving, Profit-producing appliances for use in and around Tile Mills, Brickyards, etc., etc.

We also submit designs and build machinery to meet special requirements in the lines named above.

Write to us for estimates, before placing your order. We can probably save you some money.

SEND FOR CATALOGUE.

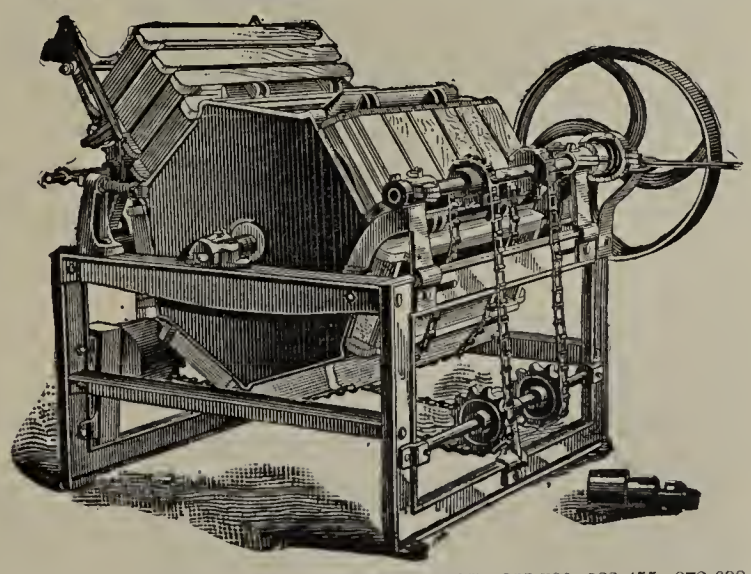
NEW YORK OFFICE, 41 Dey Street.

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been successful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

ODD LENGTHS OF RUBBER AND GIANT RED STITCHED, from 2 ft. to 80 ft. long, and from 1 in. to 16 in. wide; 3, 4, 5, 6 and 8 ply. **First-Class Belting** less than mfrs. cost prices. **Get Our Prices** on Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gages, Brass Fittings, Hard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws, Asphalt Felt Roofing, Endless Thresher Belts. **One Trial** will make you a regular customer of the **MILLER OIL AND SUPPLY COMPANY, 36 McNabb St., Indianapolis, Ind.**

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent.
H. W. FULLER, Gen'l Pass. Agent.
CINCINNATI, OHIO
WASHINGTON, D. C.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 3:05 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 12:20 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY.

Lv Indianapolis, 4:10 am, 8:05 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

HALF RATE TO Cincinnati, O.,

and Return, Via

BIG FOUR ROUTE

ON ACCOUNT OF

Fall Festival,

Sept. 19th to 29th, 1900.

Round trip tickets will be on sale from points on the "Big Four" within approximate distance of 135 miles at rate of one fare for round trip (except no rate less than 25 cents) on

Sept. 19, 21, 24, 26 and 28.

Tickets good for return one day after date of sale.

In addition to above, round trip tickets to Cincinnati with

Final Return Limit Sept. 30th,

(covering entire period of Fall Festival) will be sold on

Sept. 19th to 29th, inclusive,

at rate of

One and One-third Fare.

For full information and particulars as to rates, tickets, limits, etc., call on Agents "Big Four Route," or address the undersigned.

WARREN J. LYNCH, Gen. Pass. & Tkt Agt.
W. P. DEPPE, Asst. G. P. & T. A.
CINCINNATI, O.

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY,
Industrial Agt., St. Louis, Mo.

or

E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western

RAILWAY.

Short line between **INDIANAPOLIS** and **KANSAS CITY.** The **only line** running **Reclining Chair and Sleeping Cars** between **CINCINNATI** and **INDIANAPOLIS, DECATUR, SPRINGFIELD, JACKSONVILLE, HANNIBAL** and **QUINCY.**

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	4.05 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

Solid Train Between

Sandusky and Peoria

—AND—

INDIANAPOLIS and MICHIGAN CITY,

FT. WAYNE and CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger	7:00 a. m
*No. 22 Passenger	1:20 p. m
No. 24 Passenger	7:00 p. m

SOUTH BOUND—ARRIVES.

*No. 21 Passenger	10:20 a. m.
No. 23 Passenger	2:50 p. m.
No. 25 Passenger	6:20 p. m

*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent, Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS. Agent and Patentee, **161 Grand Street, Rahway, N. J.**

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } **Chenoa, Ill.**

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.

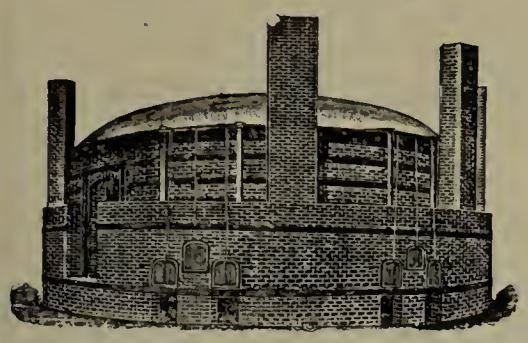
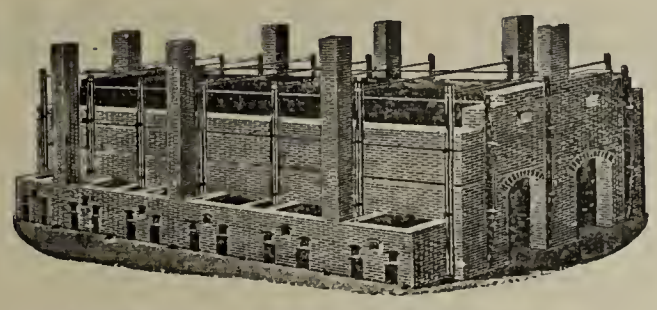
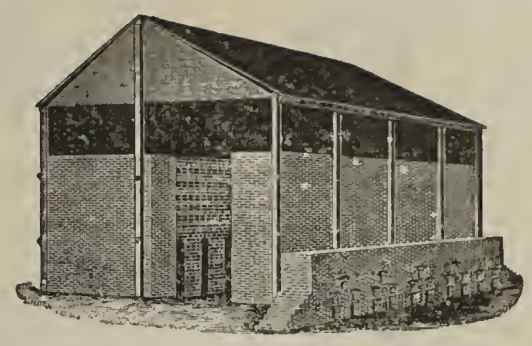
For **uniformity** in **burning, hardness** of **ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump,** and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

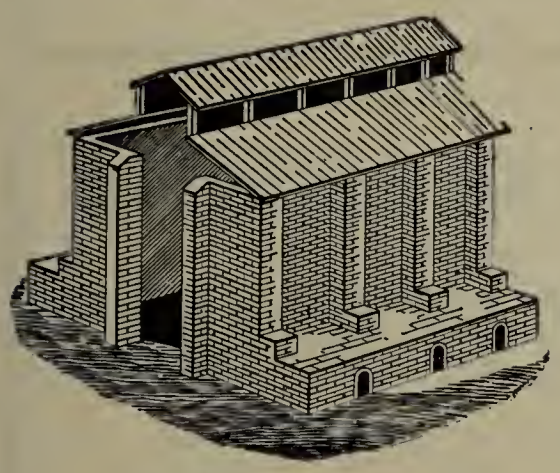
S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

The THREE KINGS.

SWIFT SLACK COKING TABLE FURNACE KILNS. Hundreds of old kilns changed and many new ones built in the past year. Send for Catalogue and Price List of Plans and Specifications.

F. E. SWIFT, Washington, Iowa. U. S. A.

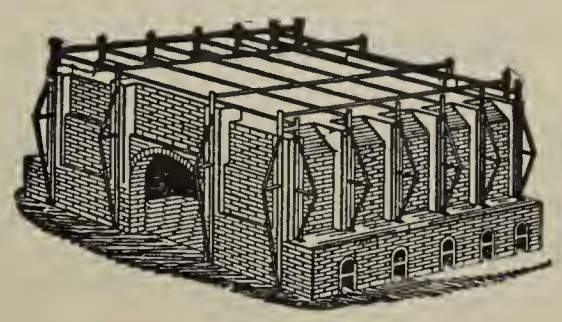


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL,* 2,422 Chestnut St., *Kansas City, Mo.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

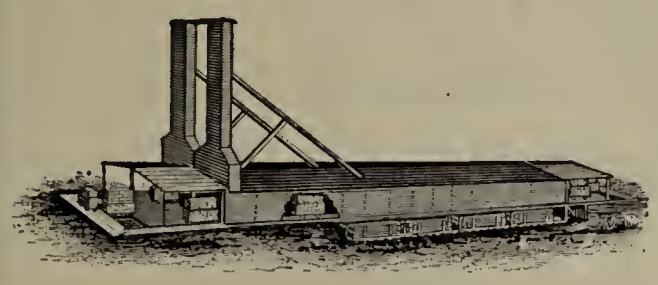
Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

A. F. BARRON,

Patentee and Builder of the

CHICAGO IRON CLAD and BARRON'S TENDER CLAY DRYERS.



These are the gradual outgrowth of a correct principle patented 28 years ago. Every year since that date has witnessed improvements that has kept this system beyond the reach of competition and we now can build Dryers to dry clay products of every grade, even if the clay is of a tender nature. The original principle is still retained. Crude methods of application displaced by money saving devices in steam fitting and construction—enabling patrons to turn out clay products of highest grade in strength and color and at a great saving in expenditure of fuel. In seeking information mention the peculiar nature of the clay, process of manufacture, etc. Address,

A. F. BARRON.

Temple Court Building. CHICAGO, ILL.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades.
Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING.

SYRACUSE, N. Y.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

THE COALDALE BRICK AND TILE CO.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

COALDALE VITRIFIED PAVERS,
Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.
The extent and character of our clays and facilities for manufacture insure uniform quality of product.
Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT, COALDALE, ALA.
TELEGRAPH OFFICE, WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

The Eastern Paving Brick Co.,

MANUFACTURERS OF THE HIGHEST GRADE

VITRIFIED PAVING BRICK and BLOCK,

For Streets and Sidewalks. Positive guarantee as to wearing qualities. Largest capacity in the East.
Correspondence solicited.

Office and Works, CATSKILL, N. Y.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date.
By H. A. Wheeler, E. M.
Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

R. D. CULVER, Pres. and Gen'l Man.
I. G. POSTON, Sec'y and Treas.

The Wabash Clay Co.,

MANUFACTURERS OF ALL SHALE

PAVING BRICKS AND BLOCKS.

Our leading brands are POSTON BLOCK, WABASH STANDARDS, "SPECIALS," for crossings on macadam streets, GUTTER BLOCKS and COLUMBIAN SIDEWALK BRICK.

Our material has for years successfully stood the heaviest traffic of Indianapolis, Terre Haute, East St. Louis and dozens of other large cities of Indiana and Illinois. We ask investigation and comparison by those seeking the best paving material. Samples furnished on application.

Office and Works at VEEDERSBURG, IND.

Preston Brick Co.,

MANUFACTURERS OF

Vitrified Shale Paving Brick,

SEWER AND HARD BUILDING BRICK.

Hornellsville, N. Y.

T. B. McAVOY, PRESIDENT.
FRANK B. McAVOY, SEC. AND TREAS.

McAvoy Vitrified Brick Co.,

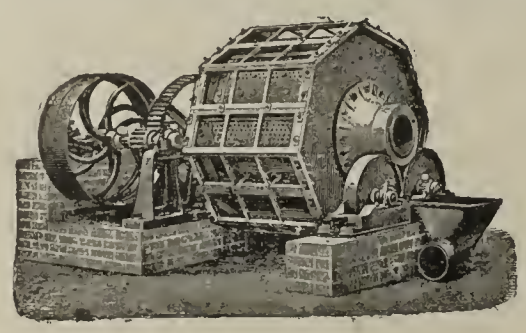
of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.

The SMIDTH BALLMILL.



Simplest ✻ Best ✻ Most Efficient.

CRUSHES, GRINDS and SIFTS in one Operation, Working Continuously.
Excells all others in Absolute Uniformity of Product.
Maximum Output. Slight Cost of Repairs. Low Horse Power.
SEND FOR CATALOGS.

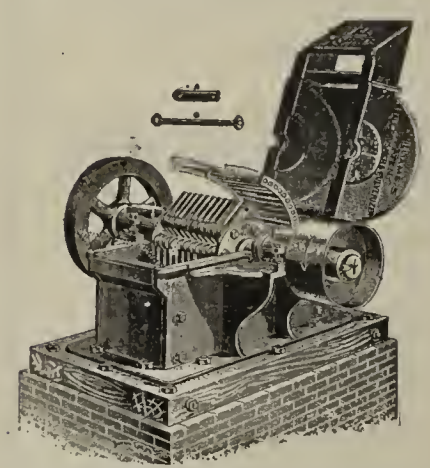
F. L. SMIDTH & CO., Engineers,
66 Maiden Lane, N. Y.

COPENHAGEN: Vestergade 29, K.

LONDON: 9 Bridge St., S. W.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer, With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

For further information write to

SUBURBAN BRICK CO.

WHEELING, W. VA., June 18, 1900.

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO, St. Louis, Mo.

Gentlemen:—Answering your favor of the 12th inst. We are pleased to say that the Shale reducing machine, put in our factory at Martins' Ferry, Ohio, has done good work, and in sufficient quantity for our needs, and has been very satisfactory in practice.

We have had no repairs or expense upon the machine, except for a set of new knives, during the past year, and this fact alone, when compared with the cost of keeping a grinding pan of the same capacity in repair, ought to be all the encomium or recommendation your machine needs to commend it to practical people.

Very truly yours,
SUBURBAN BRICK CO.,
Per B. F. Hodgman, Sec'y.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO., 2701-2707 North Broadway, ST. LOUIS, MO., U. S. A.

Branch Offices: NEW YORK OFFICE: Singer Building. WEST VIRGINIA OFFICE: Bramwell. PHILADELPHIA OFFICE: Stephen Girard Bldg. LOUISVILLE OFFICE: 1301 West Main Street.

Just Out.

The Second Edition of

Tables of Analyses of Clays,

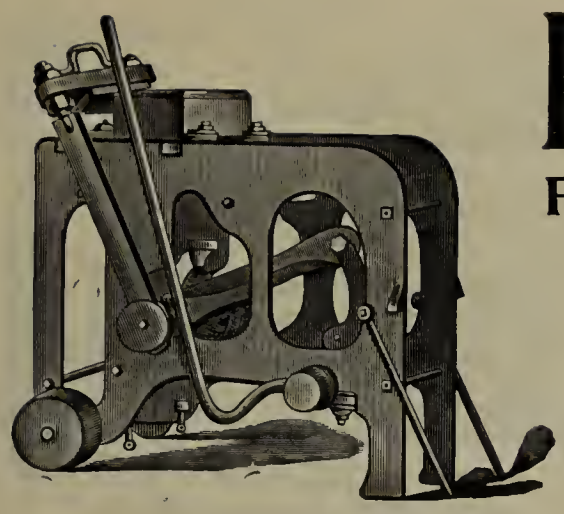
By ALFRED CROSSLEY.

This valuable book has been carefully revised and enlarged to twice the size of the original edition. Among a large number of new analyses is included the leading **Paving Brick Clays and Shales** of America. For purposes of of comparison this work is invaluable, and should find a place in the library of every clayworker. It is handsomely bound in Morocco and will be mailed postage prepaid to any address on receipt of price, $1.00.

T. A. RANDALL & COMPANY,

PUBLISHERS,

INDIANAPOLIS, INDIANA, U.S. A.



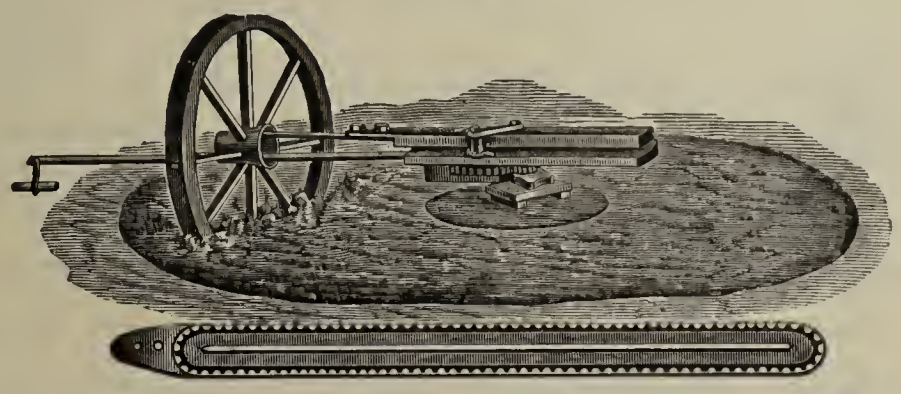
RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.

Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

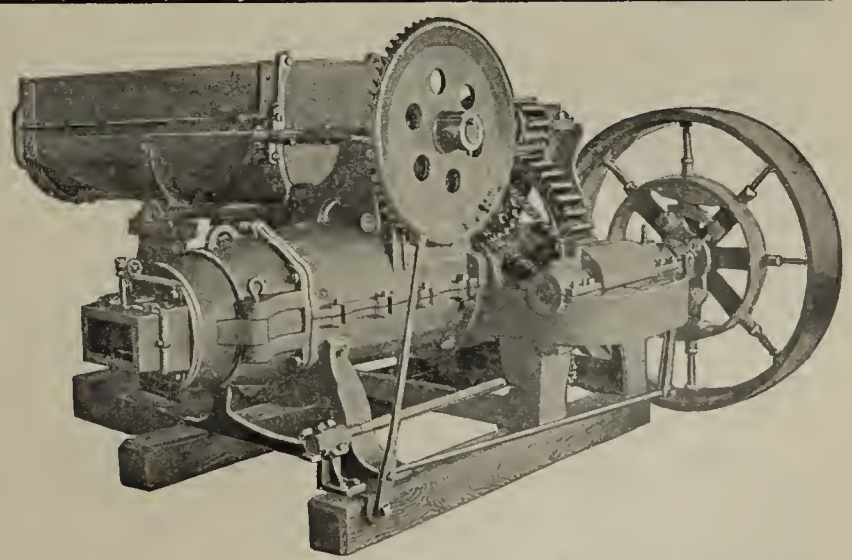
[Mention the Clay-Worker] CORRESPONDENCE SOLICITED.

TAKE A LOOK

At this for a Combined Machine. It has the advantages of other combined machines and others besides. It does not interfere with the stiffness and rigidity of the machine "proper."

The feed end of Pug Mill is clear of all machinery. Pug Mill is hinged so it can be raised clear of Machine, leaving everything free of access.

Let us talk to you about it.



All That Could be Desired.

Kinston, N. C., March 27th, 1900.

Messrs. J. C. STEELE & SONS, Statesville, N. C.

Gentlemen:—We herewith enclose check for $—— in settlement of the brick machine, cutting table, etc., purchased of you a short time ago, for which kindly send us receipt.

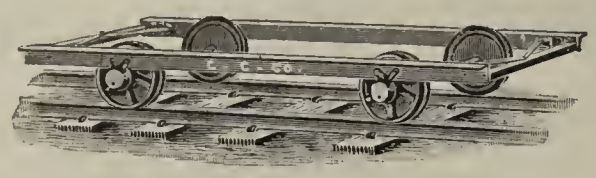
The machine is working well and we are extremely well pleased with it. It is all that could be desired.

Very truly yours, L. HARVEY & SON.

J. C. STEELE & SONS,

Manufacturers of
The "NEW SOUTH" BRICK MACHINERY,

Statesville, N. C.



No. 207.

SOFT MUD FLAT.

FOR FOOT PALLETS.

ANGLE FRAME.

Write for Prices.

The CLEVELAND CAR CO.,
Cleveland, Ohio.

A few facts worth considering.

Our Cars are equipped with

A VERY RIGID TRUSS FRAME,

IMPROVED ROLLER BEARINGS,

AND SOLID WEB WHEELS.

All of which add to their Strength, Durability, and Easy Running Qualities.

La Brique, (The BRICK,)

Published Monthly,
Annual Subscription, $1.50.

Prices of Advertisements.

FOR ONE YEAR:		FOR ONE INSERTION:	
One Page,	$80.	One Page,	$40
One-half Page,	$50.	One-half Page,	$30
One-quarter Page,	$30.	One-quarter Page,	$20
One-eighth Page,	$20.	One-eighth Page,	$15

PAYABLE IN ADVANCE.

Subscriptions and Advertisements for

La Brique

Are received by the Publishers of THE CLAY-WORKER, Indianapolis.

ORGAN OF THE BRICK AND CERAMIC INDUSTRIES IN THE FRENCH SPEAKING COUNTRIES.

10,000 copies sent by post and guaranteed by receipt from Postmaster.

All correspondence to be addressed to

Mr. H. DeWit,

61 Rue Bodeghem, Bruxelles, Belgium.

Most forcible means of becoming known throughout the World, for Brick Engineers. Before the end of the year the journal will be published in English, French and German, so that it may be read by every brickmaker in any part of the world! With the publication in three languages prices of subscription and advertisements will be augmented except for those who will have already signed contracts.

Outing BICYCLES.

HAVE bearings as near perfection as they can be made. We do not claim them absolutely dust proof. This high standard is not attained even in a fine watch. We do claim that there are no better bearings on the market. This is merely one of the many attractive features of the **Outing.** Our catalogue will tell you of others.

Chainless $75.00.

Racer $60.00. Cushion Frame $60.00.

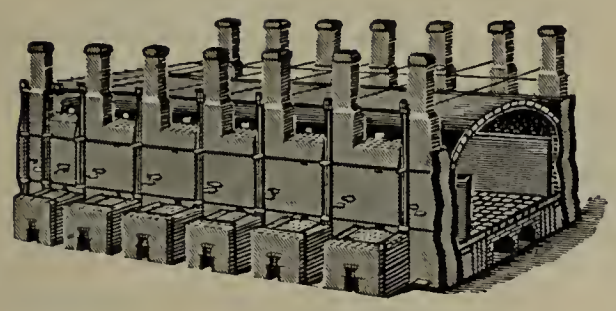
Road Wheels $50.00, $40.00, $30.00.

OUTING M'F'G. CO.,

Indianapolis, Ind.

Ask the Publisher of this Paper what he thinks of the "OUTING."

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Oaks, Pa., January 26, 1900.
M. M. BUSHONG, Phoenixville, Pa.

Dear Sir:—Your letter of inquiry of the 25th inst, in regard to kiln received; in reply will say it gives us great pleasure to say that your kiln is doing splendid work, we have made eleven (11) burns and they were all a great success, in fact it surpassed our expectations in every particular, both to quality of paving brick produced and the amount of coal consumed and we contribute its success to the perfect system of drafts and absolute control of same. In other words if your kiln does not burn evenly from top to bottom or wall to wall it is the fault of the man in charge and not the kiln.

We have had a wide experience in the kiln line and do not hesitate to say that your kiln is the best for burning Shale Paving Brick to be found.

We can assure you that in the future should we build more kilns they will be the **Bushong Down Draft.** Wishing you success we remain,

Yours respectfully,
PERKIOMEN BRICK CO.,
Per HAGGINBOTHAM, Supt.

BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.

These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

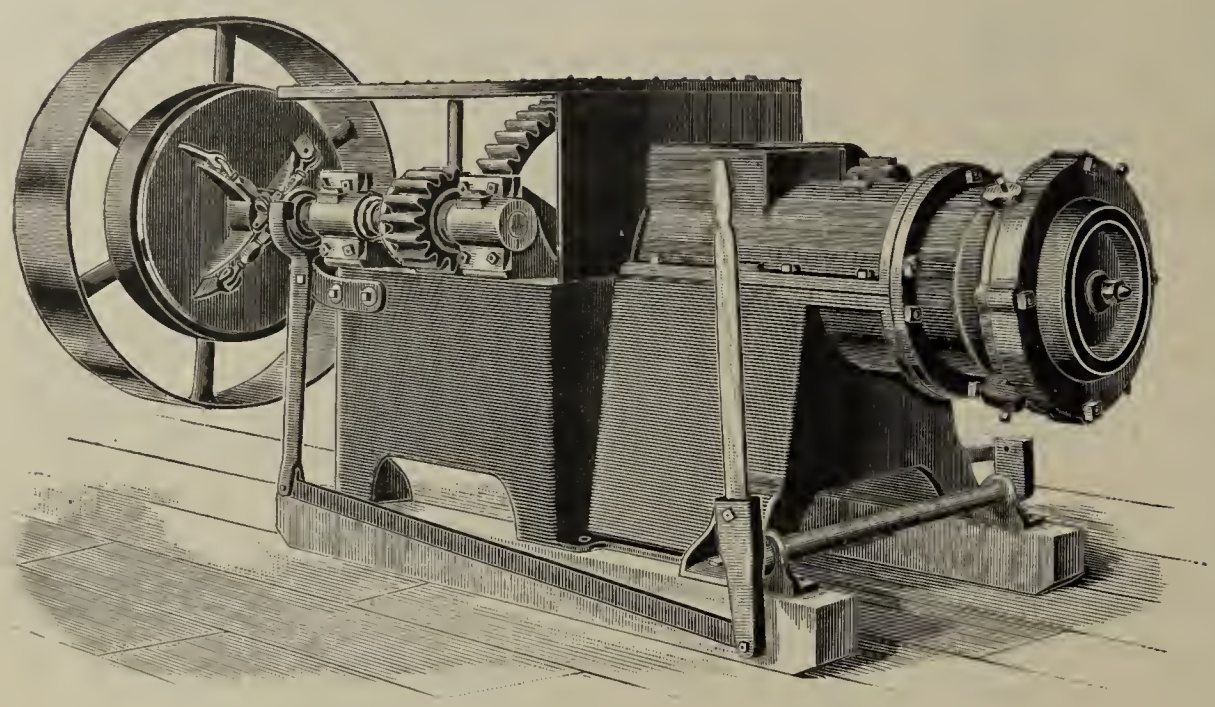
The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

TWENTY YEARS.



LEADER No. 25 with Drain Tile Die Attached.

JOHN DAWSON & CO.,
MANUFACTURERS OF
Superior Drain Tile.

Fremont, Ia., August 5th, 1900.
LEADER MFG. CO.,
Decatur, Ill.

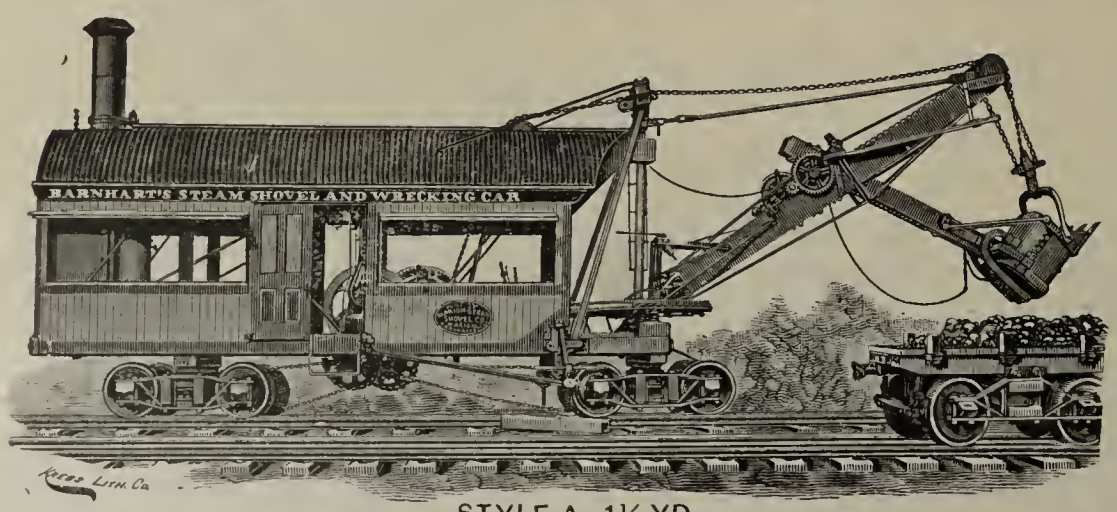
Gentlemen:—Your letter of the 28th ult. received and in reply will say that three years ago we bought a second hand LEADER Tile Machine which has now been in use TEN YEARS, IS DOING GOOD WORK AND LOOKS GOOD FOR TEN MORE. We have made about 350,000 brick on it this spring besides a supply of tile. It is the first Auger Machine we have seen work that will run the tile WITHOUT A TWIST IN THEM.

Very truly yours,
JOHN DAWSON & CO.

Our new Catalogue is ready for you.

LEADER MANUFACTURING CO., Decatur, Ill.

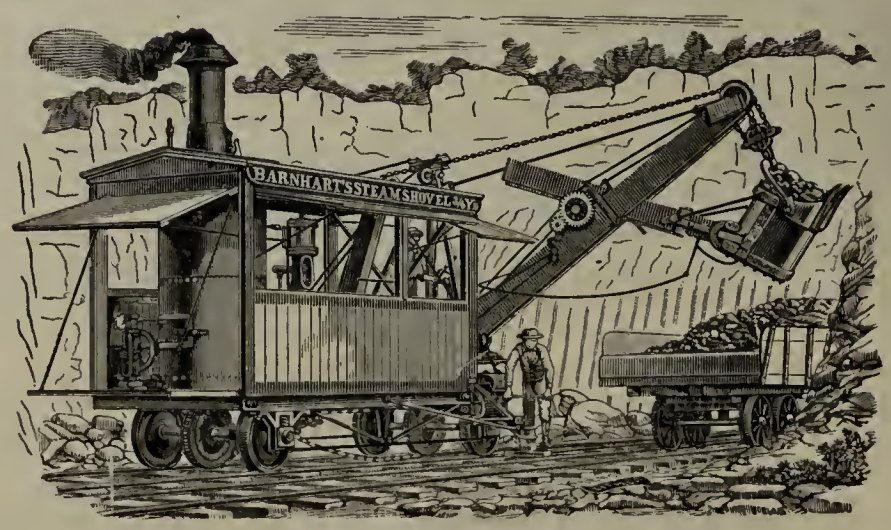
Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

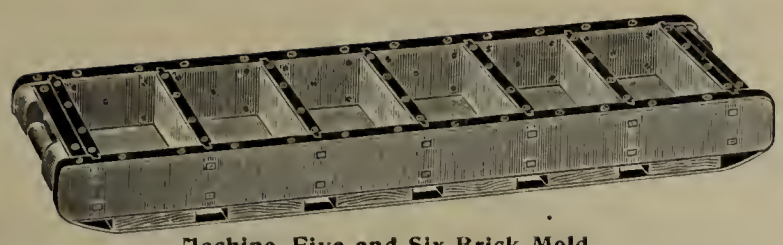


STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

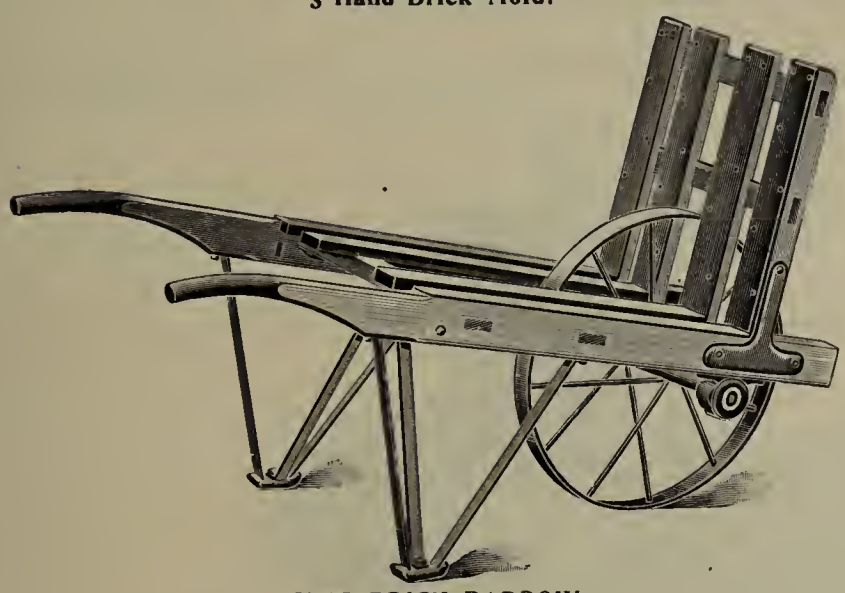
603 West Center Street, - MARION, OHIO.



Machine, Five and Six Brick Mold.

6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

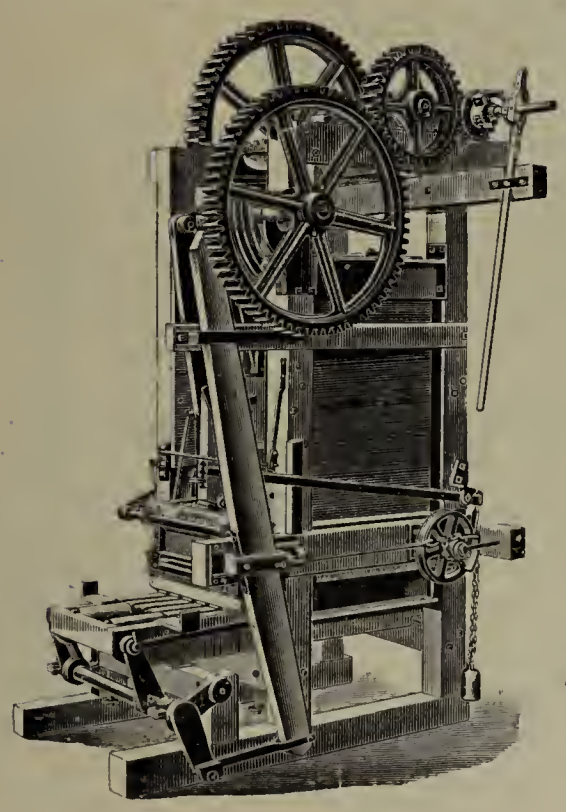
BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

D. J. C. ARNOLD,

New London, O.



The "MARTIN"

BRICK MACHINERY.

BRICKYARD SUPPLIES.

MANUFACTURED AND SOLD ONLY BY

The Henry Martin Brick Machine Mfg. Co.,

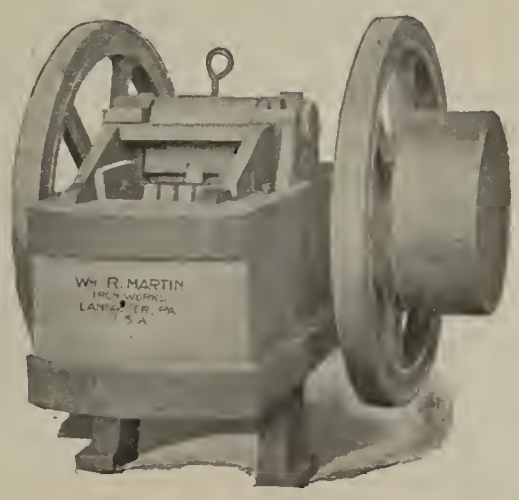
Lancaster, Pa., U. S. A.

Do You Have Our Catalogue No. 40? If not, be sure and send for it.

Everything a Brickmaker Needs.

BRICK MACHINERY,
DISINTEGRATORS,
ROCK CRUSHERS,
DRY PANS, Etc., Etc.

- MOULDS,
- BARROWS,
- TRUCKS,
- KILN CASTINGS.



We Equip Complete Brick Plants.

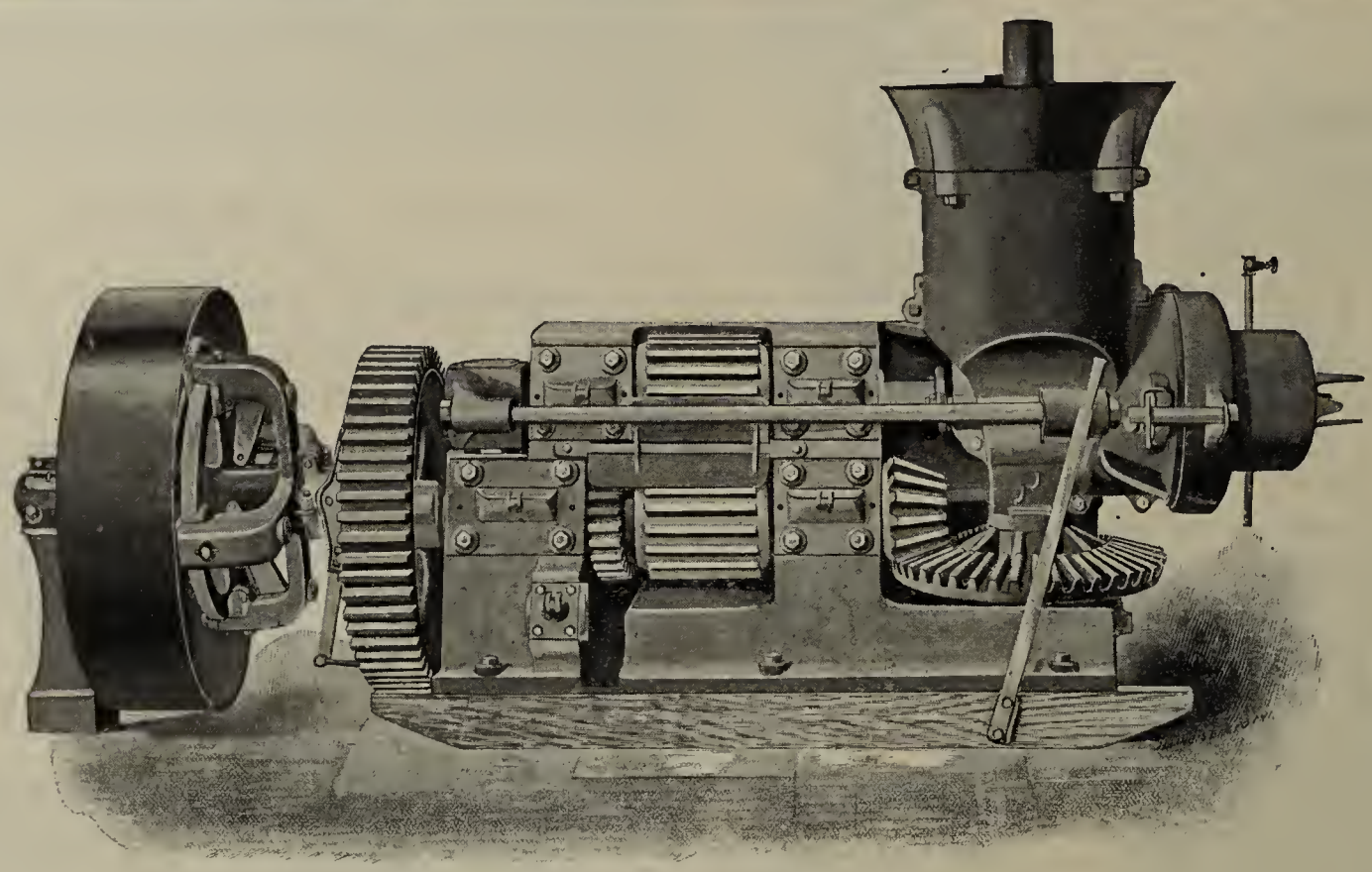
The "Wonder" and Prosperity,

Go Hand in Hand, as is Demonstrated by the Following Letter:

Deland, Ill., July 30, 1900.

WALLACE MFG. CO., Frankfort, Ind.

Gentlemen:—I wired you this p. m. send by American Express, bevel pinion O18 for Intermediate. This is the first break we have had on this mill since we put it in. I run it all last season and so far without one cent expense other than oil and a few bolts that holds the dies on. I have three good men and it gives them all they can do to keep enough clay to keep the mill running. I also have three off-bearers to take the ware



Big Wonder Brick Machine.

and put it on the shelves. I am running 12 men this season. I put in a new 80 horse power boiler this Spring and have all the power that we need. We were making 9-inch tile to-day and let the dirt get too dry on us and broke three cogs out of the bevel pinion. It was not the fault of the mill, but our own by not tempering the dirt sufficiently.

Hope you will have sent the pinion before you receive this letter. R. B. MOODY.

This is one of the many complimentary letters we receive as to the merits of our Brick and Tile Machinery.

The Wallace Mfg. Co.,

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

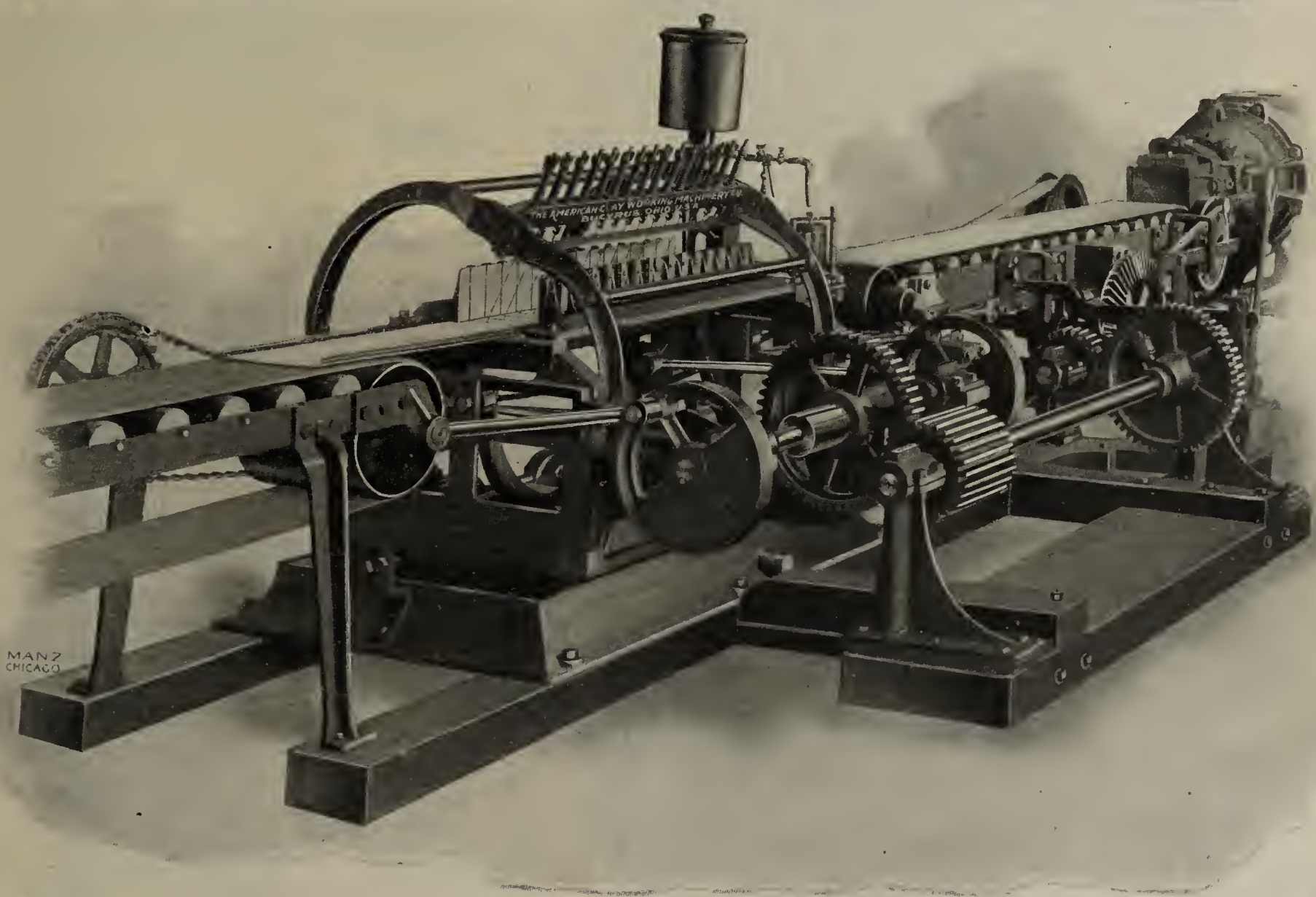
Frankfort, Indiana.

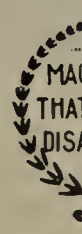
SOUTHERN MACHINERY CO., Charlotte, N. C., **Agents for Tennessee, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina and Virginia.**

Make Him Write It In the Contract.

DURING THE PAST FEW WEEKS a purchaser, who wanted to be sure of his purchase, stipulated in his contract that the machinery must be guaranted to be as good in every way as that manufactured by the **AMERICAN CLAY-WORKING MACHINERY CO., of Bucyrus.** The manufacturer accepting this order puts his name to the acknowledgement that our line is the **Standard of Excellence**. Not only that, but if the contract is lived up to—to the letter—he will have to take out his machinery because there is no other line of clay-working machinery equal to that of the American Co. It may appear to be as good but its the ceaseless operation, year after year, which shows the quality of material and faultless construction of our machines. Its a safty factor to yourself to be protected. If some other manufacturer claims his machinery is "just as good" as the American line, **make him write it in the Contract,** and make him **FULFILL THE GUARANTEE.**

Our new side cut **Oscillating Automatic Down Cut Table** is the cutting table success of late years. Its a machine to be pround of from start to finish. If your not informed regarding its advantages write us. We manufacture a full line of clay-working machinery and appliances. Make your wants known or send for our catalogue.

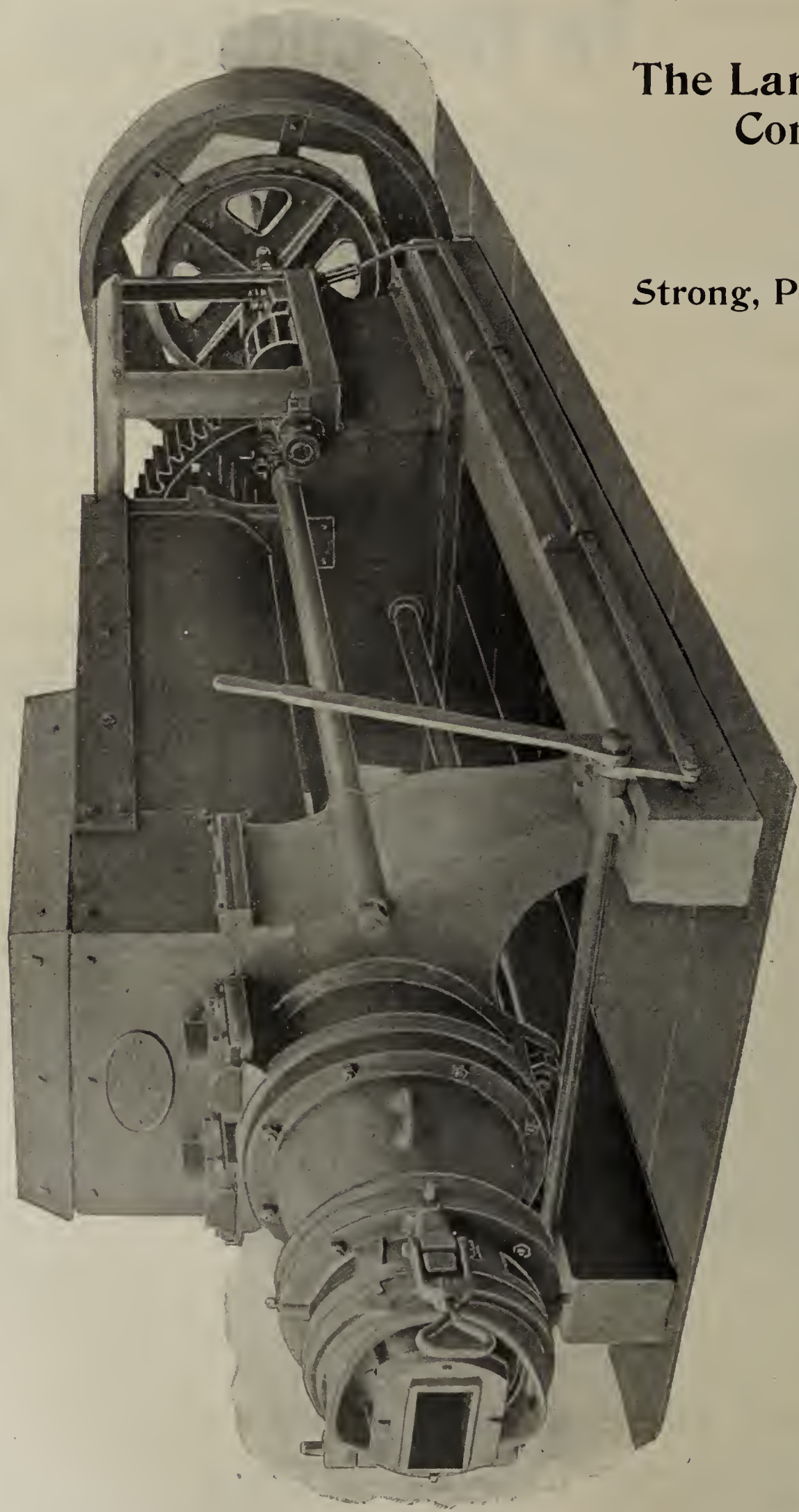




The American Clay-Working Machinery Co., BUCYRUS, OHIO, U. S. A.

NEW YORK OFFICE, 39 and 41 Cortlandt St.

The "PREMIER" BRICK MACHINE.



The Largest Combined Pug Mill and Brick Machine.

Strong, Perfectly Proportioned, Positive Force Feed.

Pugging capacity more than doubled. Note the interior arrangement. Capacity 75,000 to 100,000 brick per day.

With the "PREMIER" and Bensing's Automatic Down-cut Brick Table you have an outfit that will make MORE BRICK and BETTER, SMOOTHER FACED BRICK from any clay or shale, than can be made from the same material by any other machine or process.

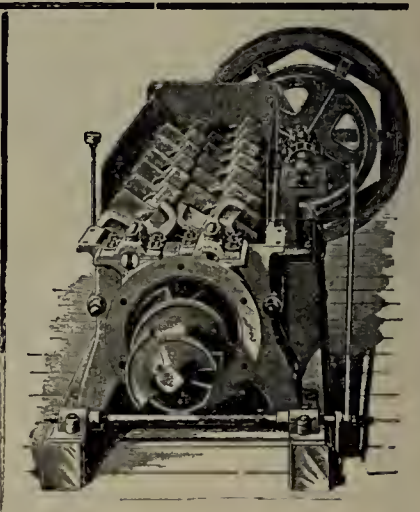
Write Us for More Particulars

Manufacturers of

"Plymouth" Brick and Tile Machines.

Bensing's Automatic Tables.

And other yard Supplies and Equipments.



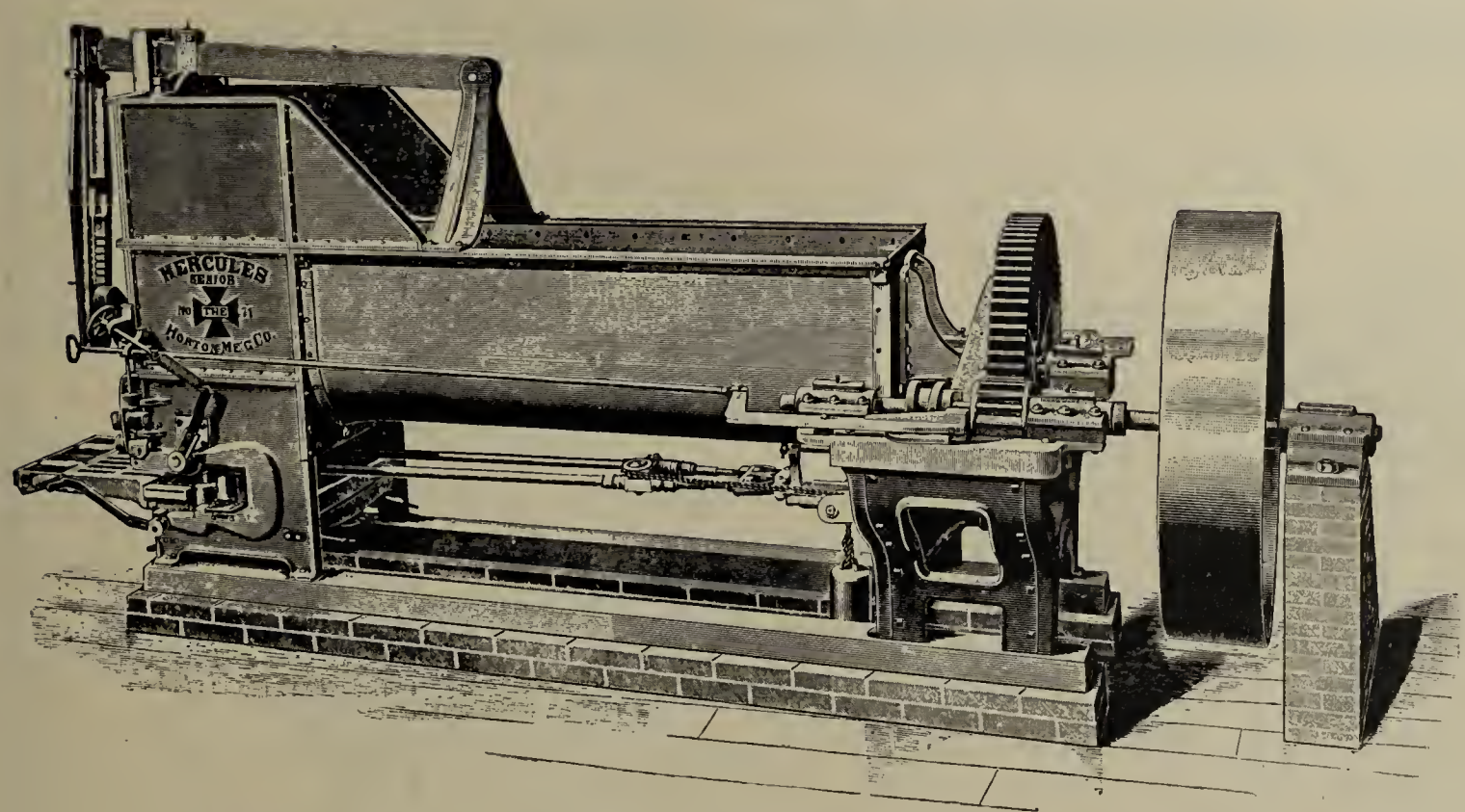
INTERIOR VIEW OF ABOVE MACHINE.

J. D. FATE & CO., Plymouth, Richland Co., Ohio, U. S. A.

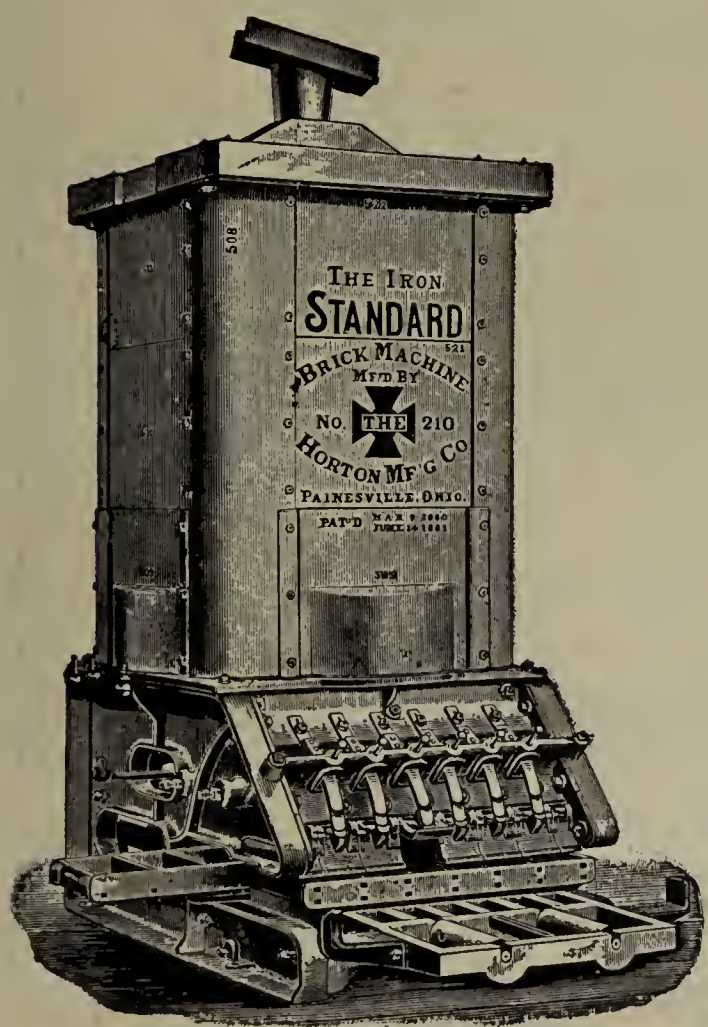
Western Representative:--B. E. LADOW, 1107 Chamber of Commerce, Chicago, Ill.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES



RON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brick-yard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

Now Will You Be ....Good....

ONCE MORE the **Potts Patents** on **Clay Disintegrators** are delared to be good and valid. That all machines using adjustably secured or solid bars cast to the roll, are infringements of the Potts Patents.

It is now only a matter of a short time until all manufacturers of these infringing machines will be prohibited from manufacturing or selling the same.

Don't let this trouble you as **C. & A. Potts & Co.,** are still in the business, and will furnish all the Disintegrators wanted. You will never have to go back to the old and expensive rolls.

The manufacturers of these infringing Disintegrators have the past six years told you the Disintegrator was the machine for you to use, if this was the case then it must be so now.

Remember the Disintegrator is the only machine ever made that will work any kind of clay direct from the bank and not choke or clog—it will grind the small stones and separate the large ones, it does not pack the clay into thin hard sheets, but leaves it in a loose open condition, so it will take water quickly and is easily pugged. It saves labor and improves the quality of Brick or Tile.

For prices write

C. & A. POTTS & CO.,
Indianapolis, Ind.

CHAMBERS BROS. CO., Philadelphia, Pa.,
Are the only Licensed Manufacturers.

BRICK MANUFACTURERS CANNOT AFFORD TO IGNORE THE SPLENDID QUALITIES OF THE CLAYWORKING MACHINERY MANUFACTURED BY **C. & A. POTTS & CO.**

Horizontal Stock Brick Machines.

All Iron or Wood Frame.

PUG MILLS, DISINTEGRATORS, MOULD SANDERS, and all Brick-yard Supplies.

They have invariably become recognized leaders in every locality, invincible in the yards and in all contests, winning their way by fine work and lasting qualities and positive economy. They are up-to-date, progressive machines, with all the latest improvements. Well Built, Strong and Durable.

There have been more Potts Machines sold this season than ever before fully one-half of which have gone to yards to replace machines which were sold last season because they were "just as good" as the Potts, and cheaper.

Reese-Hammond Fire Brick Company.

Capital Stock $500,000 **Annual Capacity, 50,000,000.**

BOLIVAR, PA., June 26, 1900.

C. & A. POTTS & Co., Indianapolis, Ind.

Gentlemen:—We have your esteemed favor of the 22nd, in reply we are pleased to state that the reports we have received from your machine are most gratifying. From the reports of our superintendent the results are entirely satisfactory, and we can assure you that it gives us great pleasure to be able to make such a report to you.

Yours respectfully,
REESE-HAMMOND FIRE BRICK CO.

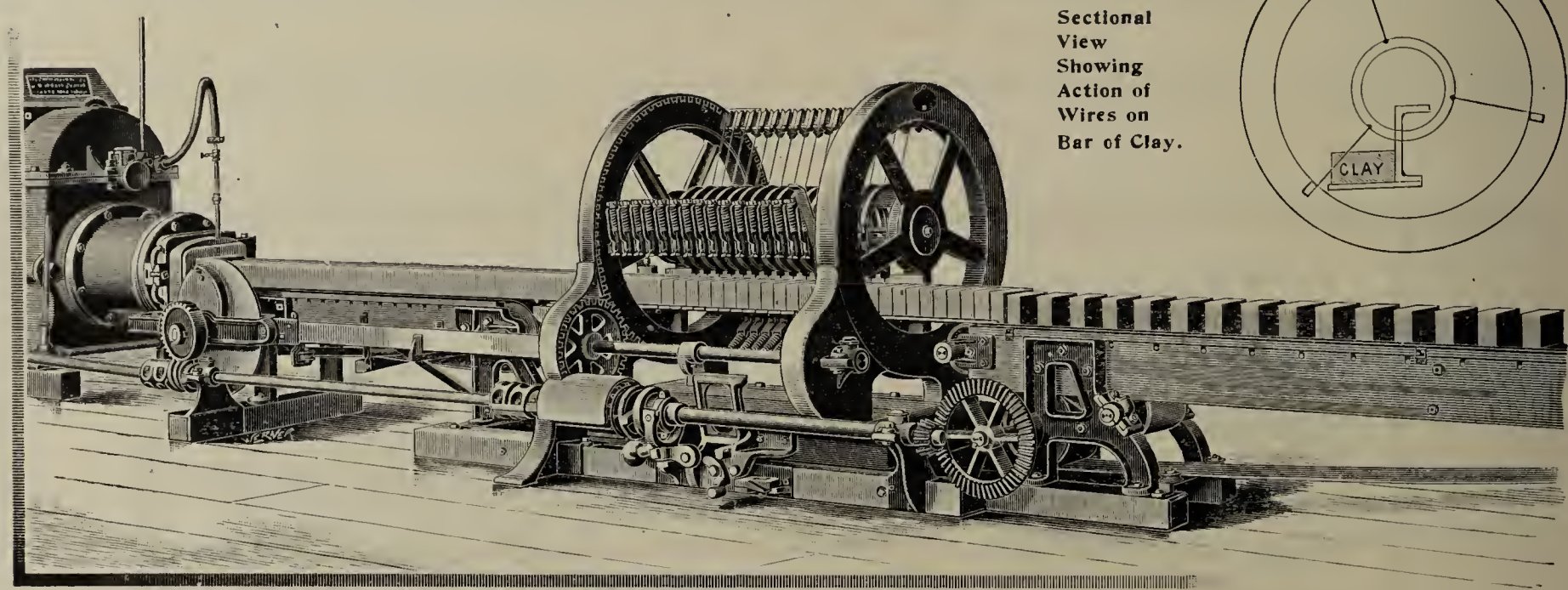
THE ABOVE LETTER IS FROM A VICTIM WHO TRIED ONE OF "THE JUST AS GOOD" MACHINES LAST SEASON. LET US TELL YOU WHY THEY MADE THE CHANGE.

C. & A. POTTS & CO.,

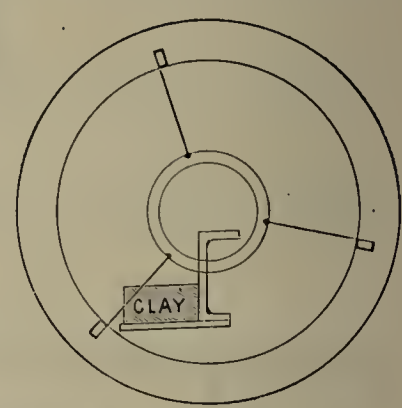
WRITE FOR OUR NEW CATALOGUE

INDIANAPOLIS, IND.

Merit Wins Success.



Sectional View Showing Action of Wires on Bar of Clay.



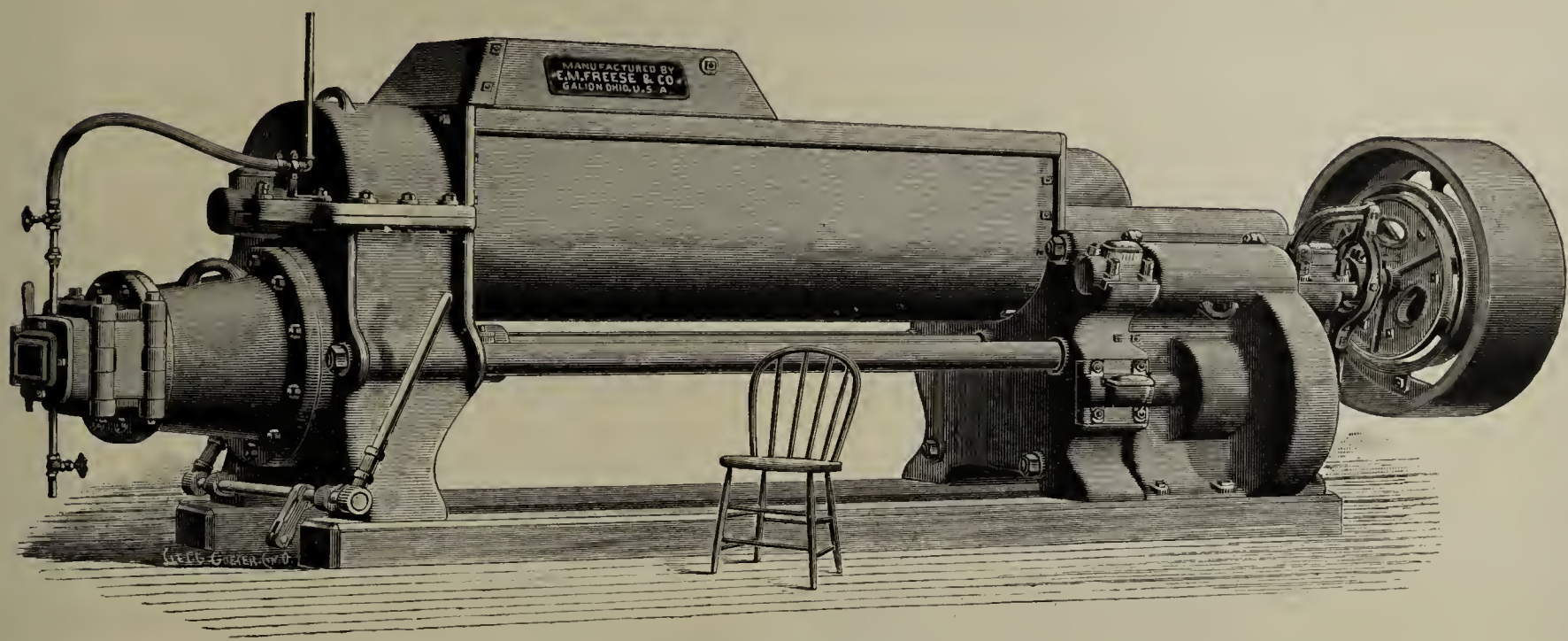
These Cutters have been Adopted by a Large Number of the Most Prominent Brick Manufacturers.

OUR AUTOMATIC SIDE CUTTER is a radical improvement over all other cutters. No slip belts or auxiliary power used. Movements are positive. Brick are cut true and of uniform thickness. They compare favorable with repressed brick. You will be pleased with the apparatus if you see it in operation.

Let us refer you to the nearest user.

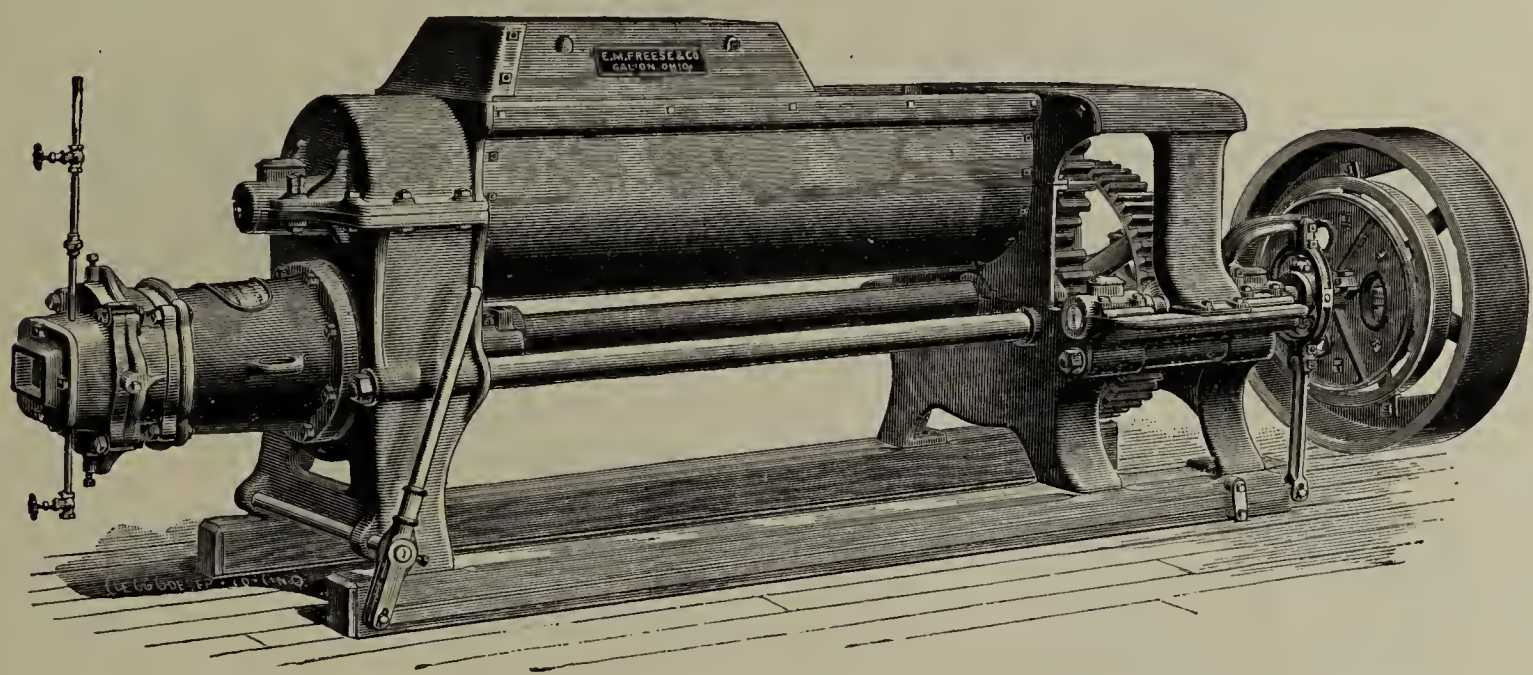
E. M. FREESE & CO.,
Galion, Ohio.

In Union There is Strength.



SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.

We are the originators of the "Union" Brick Machines.

When we combined a Pug Mill and a Brick Machine into one Machine we added strength and durability to both.

Weight, Strength and Durability means long life and less repair bills.

We build the "Union" Machines in four sizes.

No separate Pug Mill required. No clogging in Hopper, no overflow of clay, no litter.

We want to help you investigate. Ask no questions.

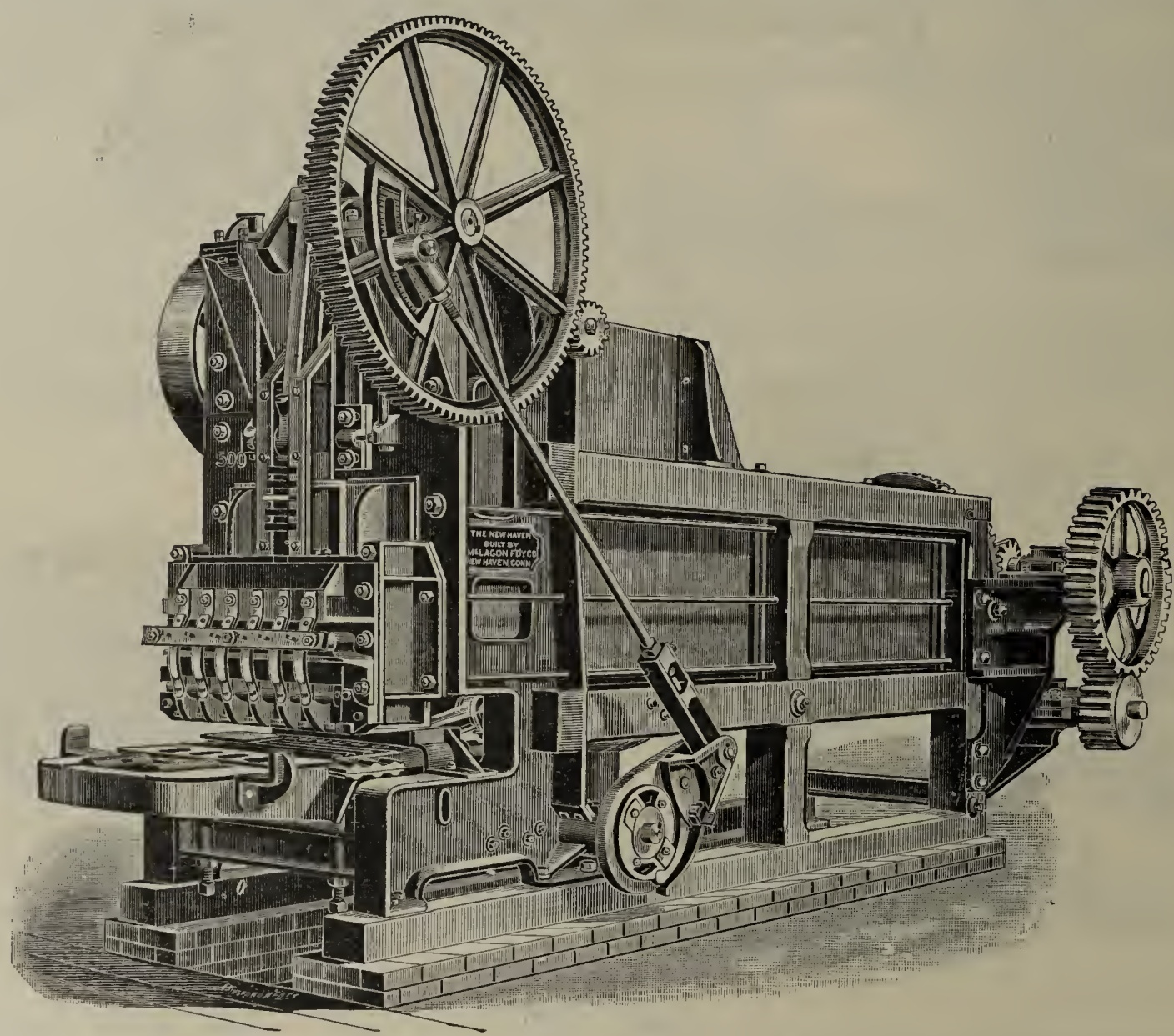
Addresses of customers on request.

E. M. FREESE & CO.,

Galion, Ohio.

"The Lamp of Experience."

Which we published recently and which may be "HAD FOR THE ASKING"
Is full of Interesting Facts for Brickmakers. Note the Quotation below.



AFTER TEN YEARS.

Lebanon, N. H., October 12, 1899.

The EASTERN MACHINERY CO., New Haven, Conn.

Dear Sirs:—I have just COMPLETED MY TENTH YEAR with machine, and IT HAS DONE JUST AS GOOD WORK AS THE FIRST YEAR. It is PERFECTLY SATISFACTORY.

Yours,
JASON DENSMORE.

"NEW HAVEN" Brick Machinery is Sold Exclusively on its Merits.

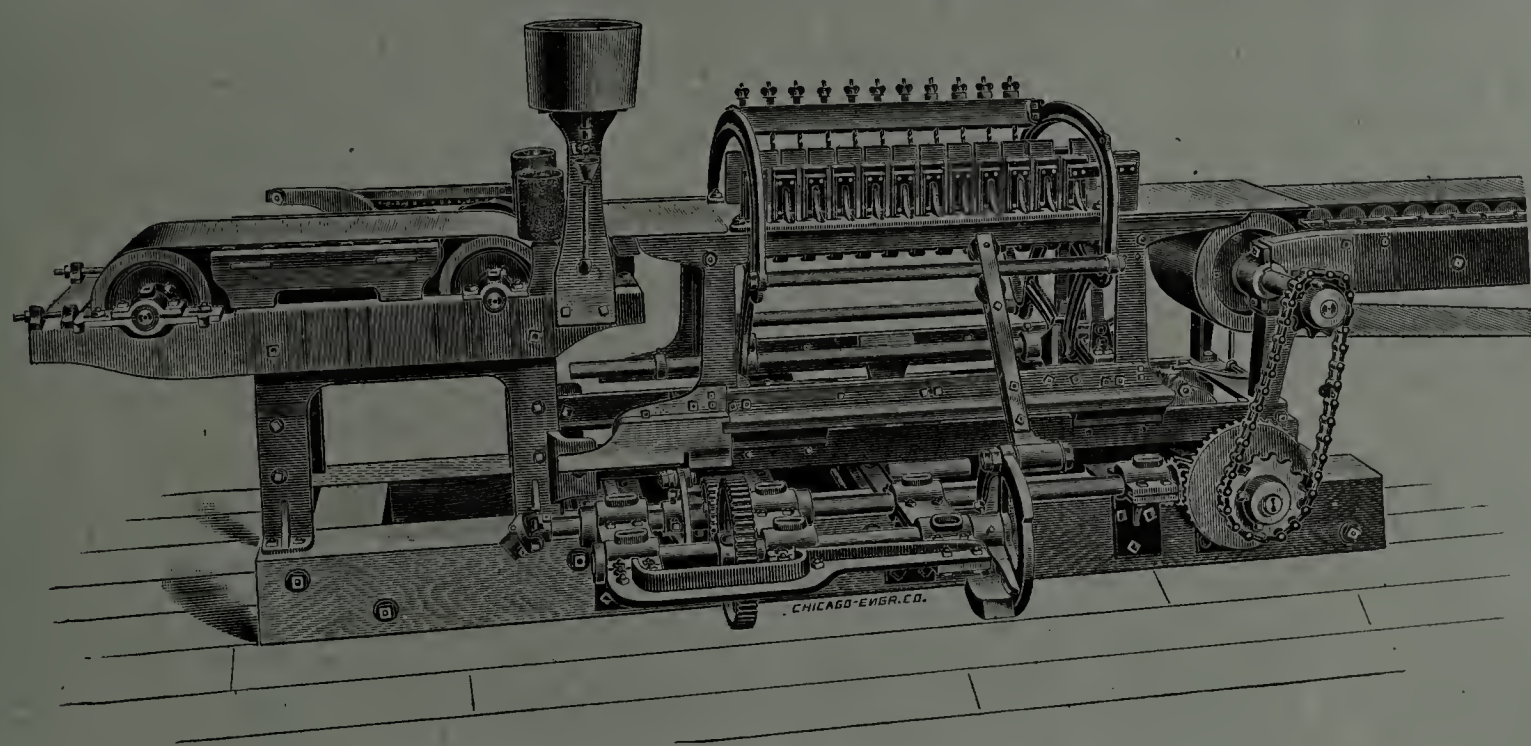
The Eastern Machinery Co.,

NEW HAVEN, CONN.

A Machine

Which has demonstrated beyond question that an Automatic Brick Cutter does not need either to be as large as a steam shovel or to make as much noise.

If a cutter cuts brick, cuts them right, cuts enough of them and gives you good wear, what more do you want? Do you want some wheels and things to go 'round and round just to look at? The brick man says "No."



The BREWER No. 60 AUTOMATIC CUTTER.

This machine has all the wheels and everything else it needs but not one too many. There isn't a machine in the world, no matter how many flip-flops and trigger-jiggers it has, that works any better. It is true as a die and as sound as the rock of Gibralter. Just a plain brick cutter made to cut brick and not for ornament. It does the business too.

Information and Catalogs for the asking.

H. BREWER & CO., Tecumseh, Mich.

Send for Catalogue of

"A. B. C." BRICK DRYERS

....TO....

American Blower Company,

Detroit, Michigan.

New York. Chicago. London.

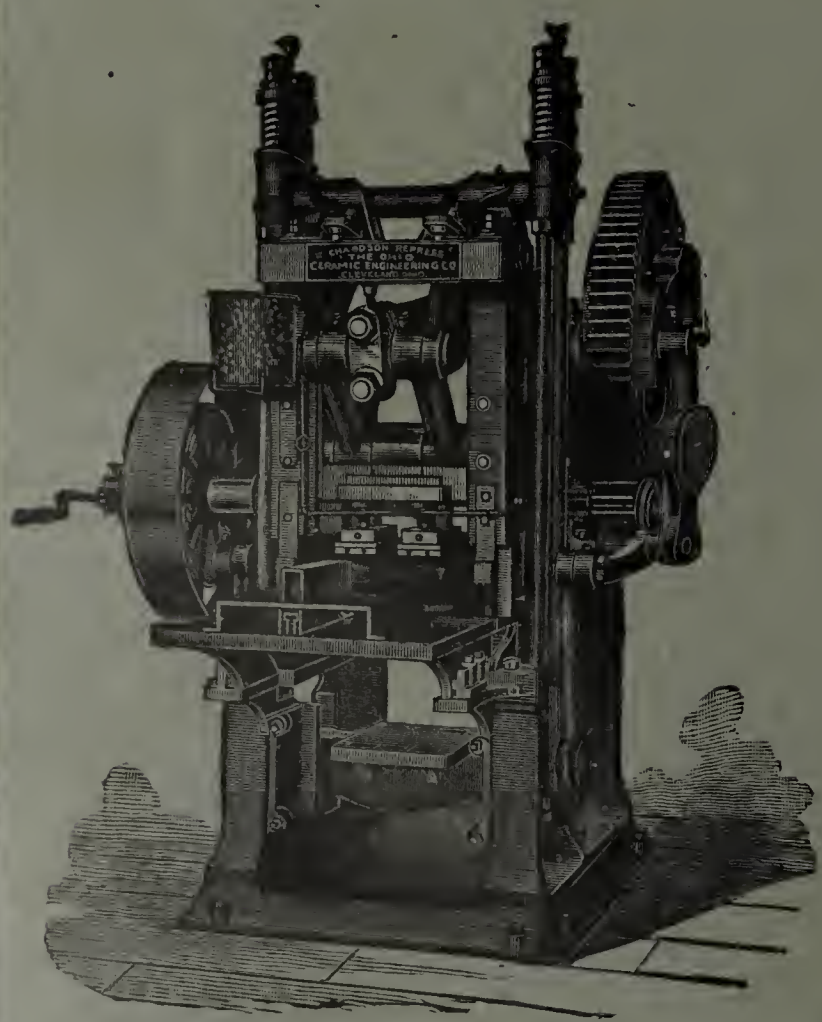
A FEW COLD FACTS.

WE HAVE from time to time during the years we have been in business made many changes in the construction of our Sewer Pipe Press. Each time these changes have created among other manufacturers a strong protest of—**no good—it won't work,** and yet in a short time they were all trying to attain the same end. They copy **the best** because it is ahead in the procession. This fact alone should convince you that the **Vaughn Press** is up-to-date. Do you want the best Press or do you want to stay in a rut and use Grandfather's method? Better have a talk with us and make money.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS, OHIO, U. S. A.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



The RICHARDSON REPRESS.

To Get Customers— —That's Why We Advertise

EVERY MANUFACTURER OF BRICK MACHINERY IN THE COUNTRY DOES THE SAME THING.

BUT....

AFTER WE GET A CUSTOMER, WE KEEP HIM AND SOME OTHERS DON'T.
LET US WRITE YOU ABOUT OUR REPRESSES.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

The Ohio Ceramic Engineering Co.,

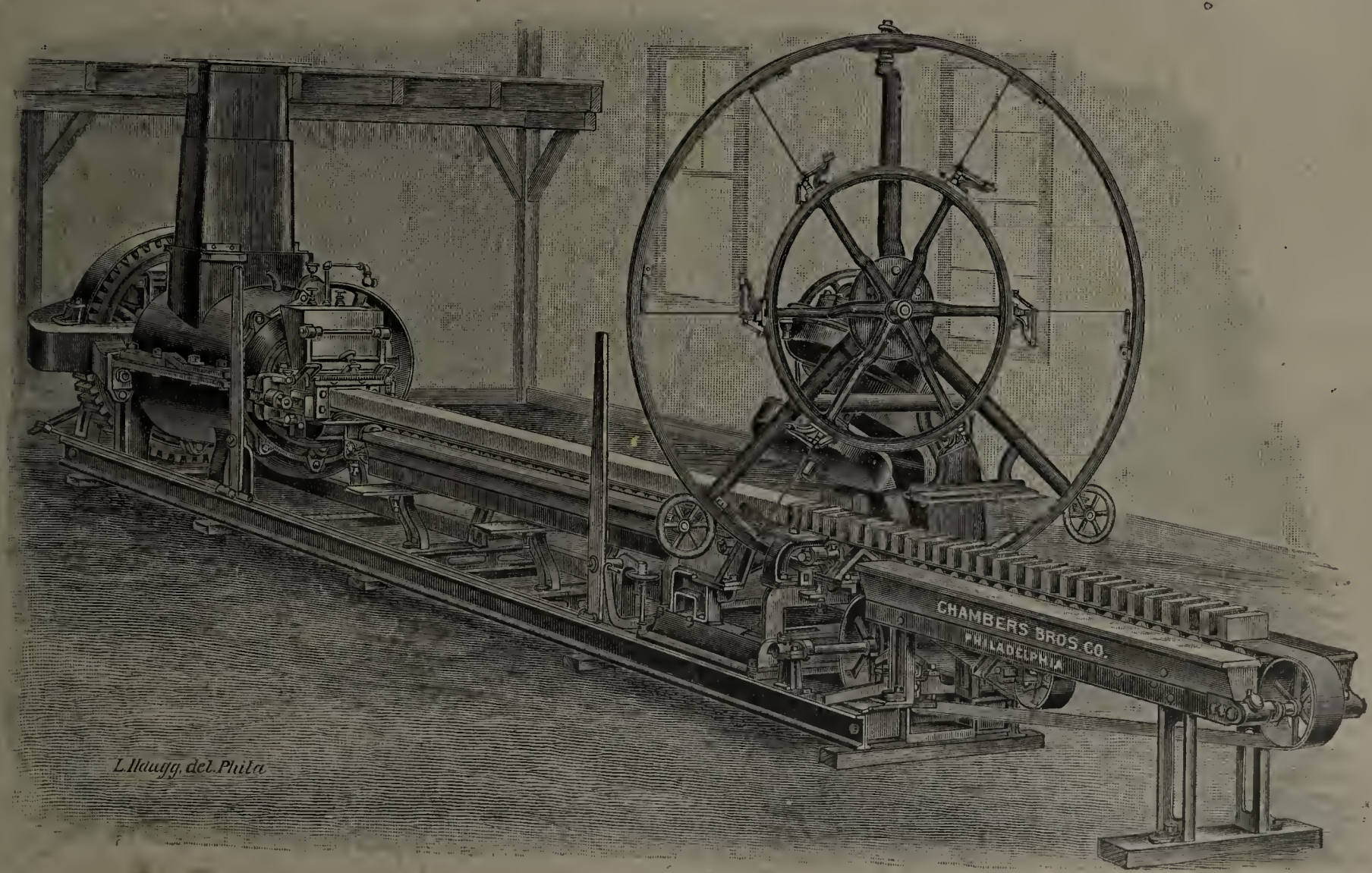
Cleveland, Ohio.

Table of Contents, Page 299.

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIV, No. 4. INDIANAPOLIS, IND. OCTOBER, 1900 $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

PHILADELPHIA, PA.

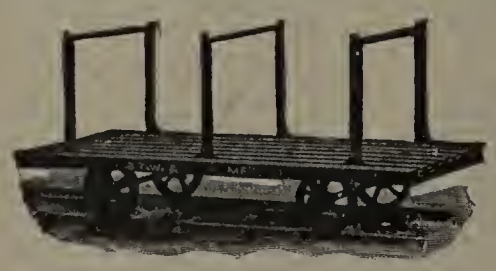
J. E. EASTES, Chicago Agent,
171 South Canal Street.

The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

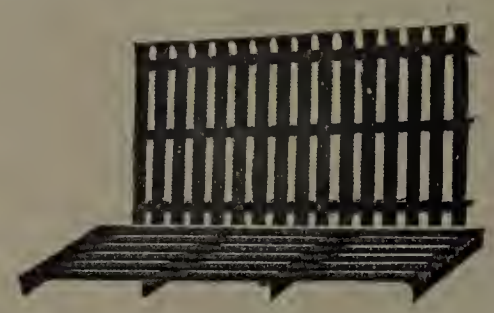
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.

No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet 7 inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name.	Page.
American Clay-Working Mach Co, The	257 328
Anderson Foundry and Mach. Works	256
Chicago Brick Machinery Co	259
Chisholm, Boyd & White Co	258
Fernholtz Brick Machinery Co. The	261
Progress Press Brick and Machine Co	309
Ross-Keller Brick Machine Co	..

Brick and Tile Machinery.

Name.	Page.
American Clay-Working Mach Co., The	257 328
Anderson Foundry and Mach. Works	256
Baird and Son, H. C.	312
Battenfeld Mfg. Co, The	307
Brewer. H. & Co	335
Chambers Brothers Co	253
Chicago Brick Machinery Co	259
Eastern Machinery Co, The	334
Fate & Co., The J. D	327
Freese, E. M. & Co	332, 333
Henry Martin Brick Mach. Mfg Co, The	325
Hensley, J. W	255
Horton Mfg Co, The	329
Kells Foundry and Machine Co	312
Leader Mfg. Co, The	324
Madden & Co	311
Ohio Ceramic Engineering Co., The	336
Potts & Co., C. & A	330, 331
Raymond Co., The C. W	300, 301
Stedman Foundry and Machine Works	261
Steele, J. C., & Son	321
Wallace Mfg. Co, The	305
Wellington Machine Co, The	303
Wiles Co., A. M. & W. H	321

Brick Kilns and Dryers.

Name.	Page.
Alsip, S. H	317
American Blower Co. The	336
Barron, A. F	320
Bushong, M. M	323
Eudaly, W. A	323
Haigh, H	320
Illinois Supply and Construction Co, The	260
Morrison & Co., R. B	313
New York Blower Co., The	314
Phillips, S. G	317
Pike, E. M	317
Reppell, L. H	320
Swift, F. E	320
Standard Dry Kiln Co. The	262
Yates, Alfred	314

Brick Yard Supplies.

Name.	Page.
Atlas Bolt & Screw Co, The	254
Arnold, D. J. C	325
Borden & Selleck Co	310
Buhl Malleable Company	311
Cleveland Car Co	316
Caldwell & Son Co., H. W	315
Carmichael, T. W	314
Carnell, Geo	321
Cox, Geo. S	315
Elder & Dunlap	314
Frost Engine Co	326
Harrington & King Perforating Co, The	255
Henry Martin Brick Machine Mfg. Co, The	325
Horton Mfg. Co, The	329
Jeffrey Manufacturing Co, The.	315
Kendall & Flick	..
Marion Steam Shovel Co	324
Main Belting Co	310
Mershon & Co., W. B	312
Newton, A. H	315
Newton A. C	316
Phillips & McLaren	313
Rockwood Mfg. Co, The	311
Smidth & Co., F. L	322
Turner, Vaughn & Taylor Co	336
Vanduzen Co., The E. W	315
Wells & Hall	315
Williams Patent Crusher and Pulverizer Co	322

Miscellaneous.

Name.	Page.
Baird & Co., Henry Carey	313
Burt Manufacturing Co	299
Chesapeake & Ohio R. R	316
Clinton Paving and Building Brick Co., The	318
Coaldale Brick & Tile Co., The	319
Cotton Belt Route	317
Dean Bros. Steam Pump Works	312
DeWit, H	313
Eastern Paving Brick Co	319
Engelhard, Charles	315
Evans & Co., Victor J	316
Evens & Howard	310
Gabriel & Schall	315
Green & Hunter Brick Co	319
Harper-Norton Shale Brick Co The	319
Indianapolis Engraving and Electro Co	314, 315
Indiana, Decatur & Western	317
Lake Erie & Western	317
McAvoy Vitrified Brick Co	318
Miller Oil and Supply Co	316
New York Brick and Paving Co	319
Osborne, W. R	314
Outing Mfg. Co	298
Preston Brick Co	318
Pennsylvania Line	316
Purington Paving Brick Co, The	318
Ripans Chemical Co	316
Sears, Roebuck & Co	314
Terre Haute Brick and Pipe Co.	318
Vandalia Line	316
Wabash Clay Co., The	318
Ads., Small Wanted, For Sale, etc,	

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

Samples or blue prints with prices furnished on request.

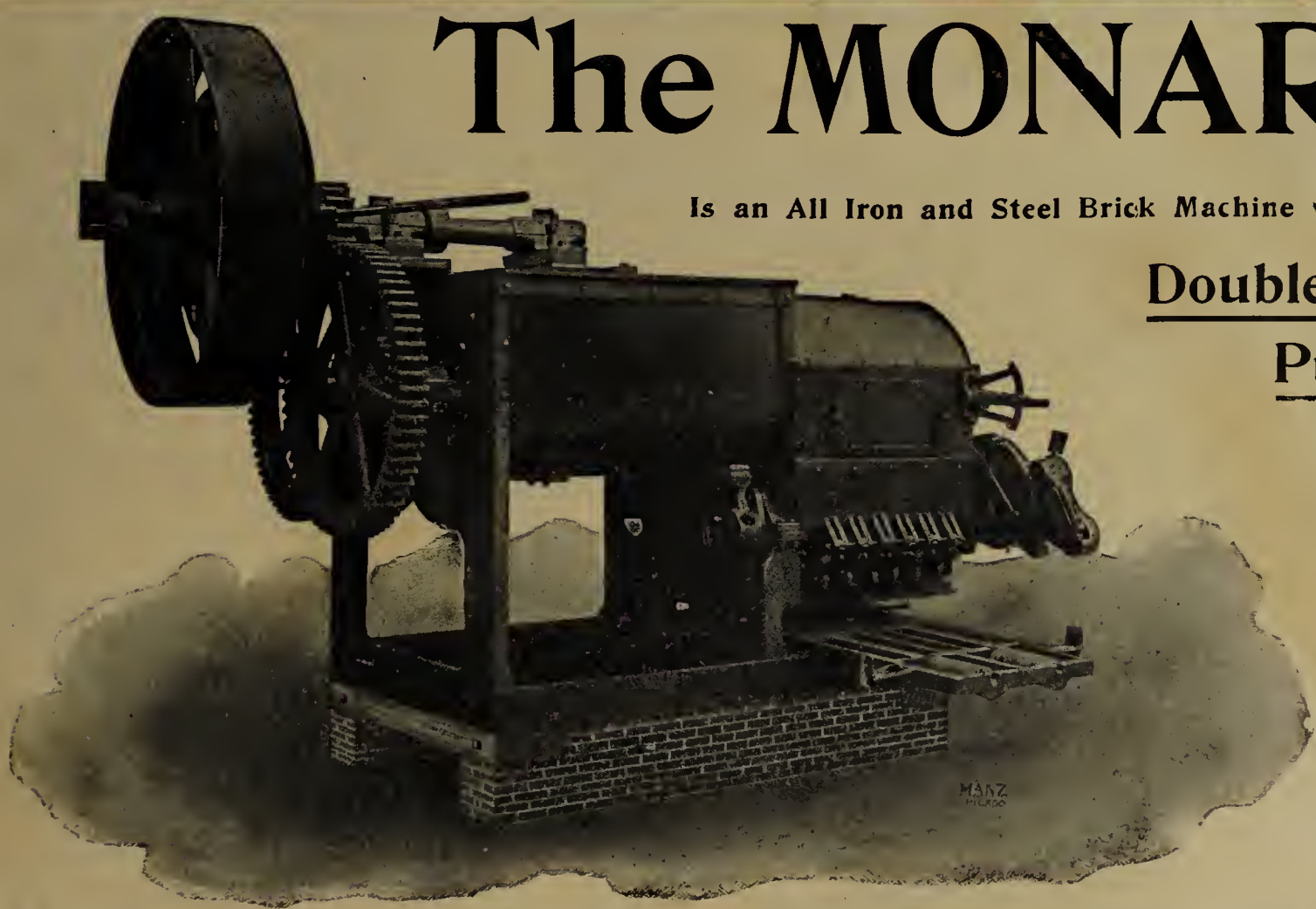
THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.

• • •



SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

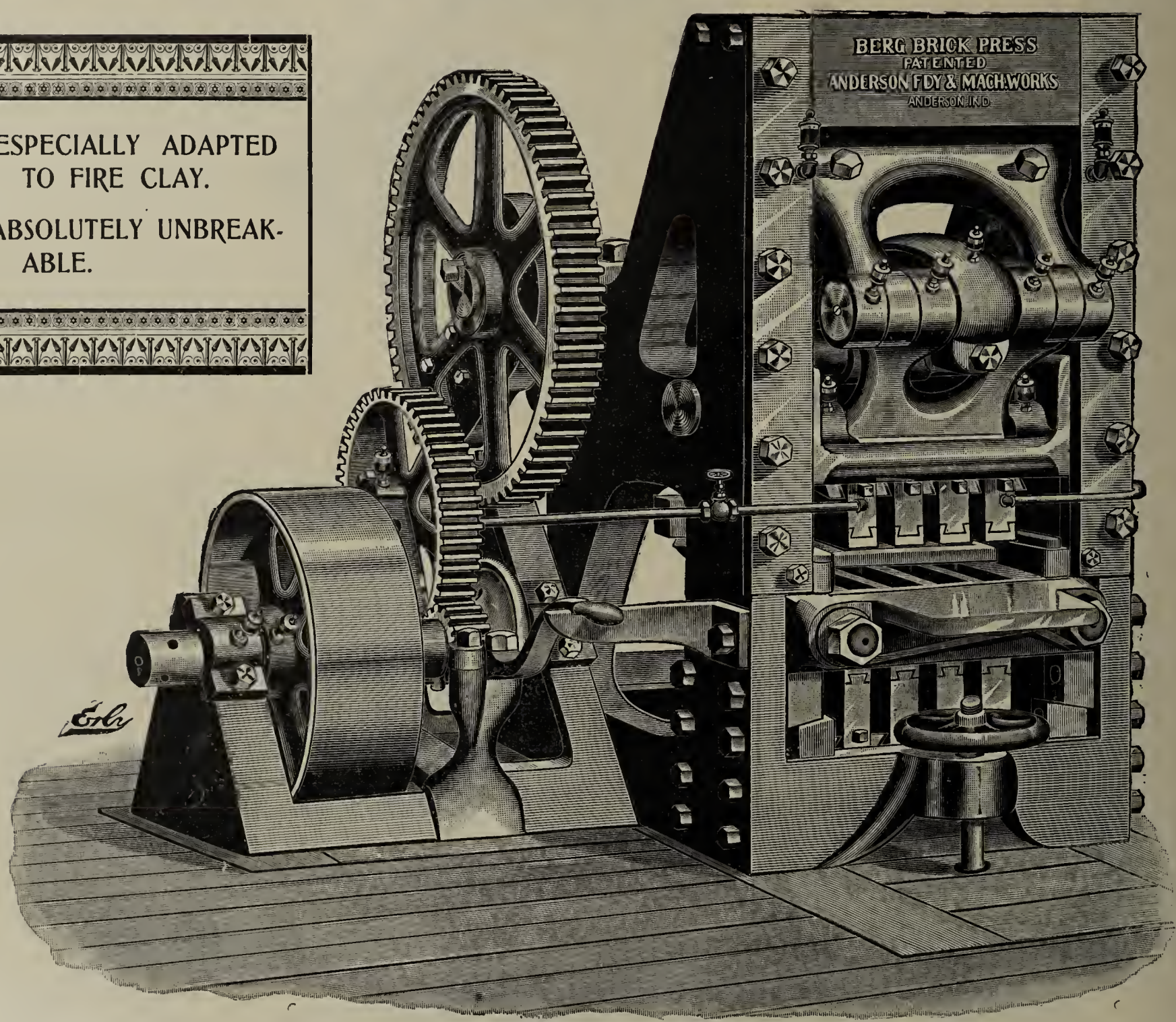
JAMES W. HENSLEY, Successor to S. K. FLETCHER. **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

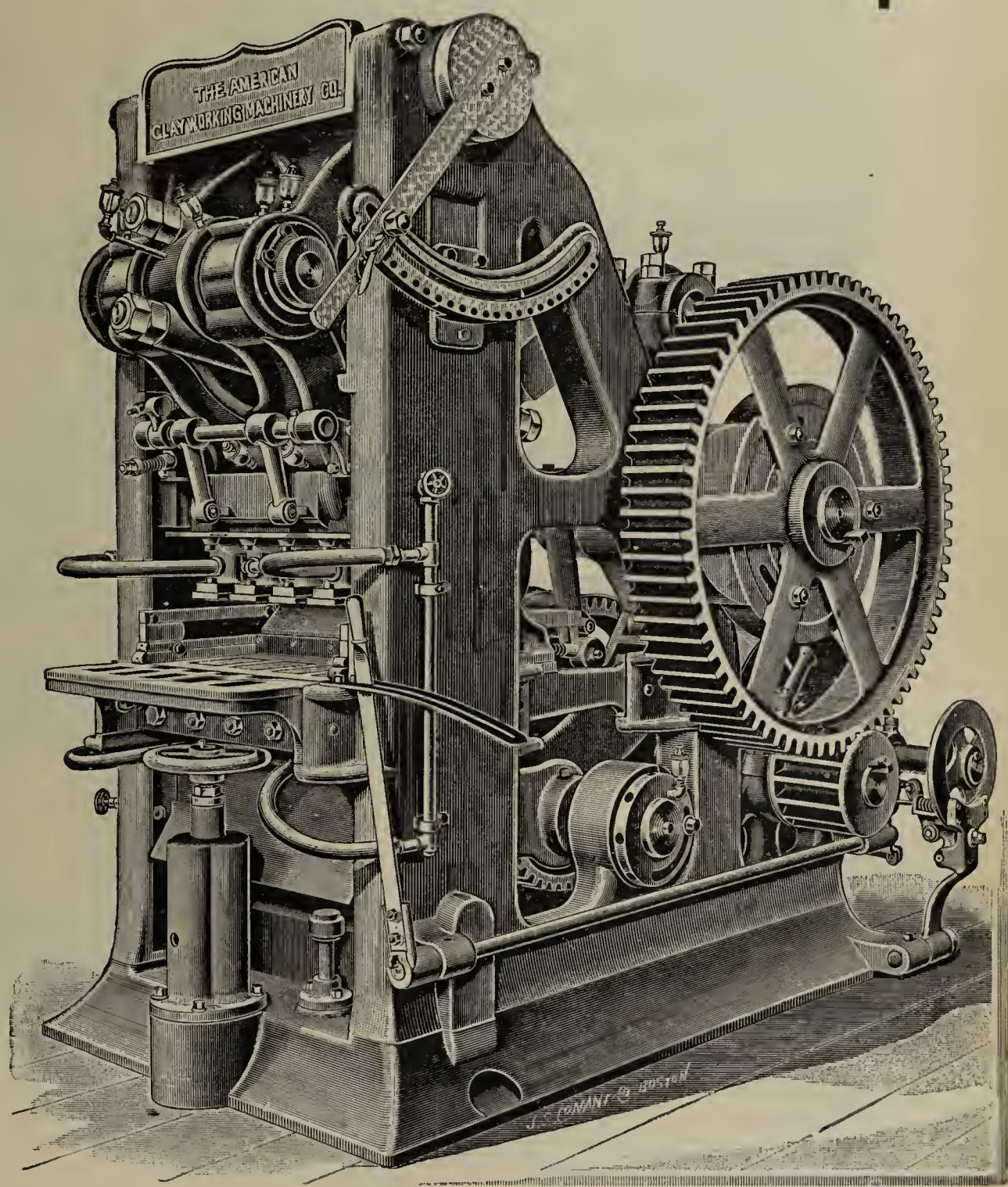
MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

It's Up To You!

Built Right.
Run Right.

THE first requisite of a successful machine is the principle on which it works. No matter how good the making or material, no matter how alluring the price may be, if the principle is not good it is an undesirable machine, which will eventually land its owner in bankruptcy or the mad house and itself in the scrap heap. An investment in such machinery is little better than criminal. Look thoroughly into the market before you buy, then if you do not buy our machinery your misfortune will be an error of judgment only. We have kept a constant step with the clay business for half a century. The same exacting care which has kept us in the front rank of manufacturers is keeping us in the lead. Some of our most popular machinery is our dry press line. They're "Built Right and Run Right." If you are in the market write us. We build dry press, stiff mud and soft mud machines. Our complete catalogue for the asking.



The American Clay-Working Machinery Co.,

NEW YORK OFFICE:
39 and 41 Cortlandt Street.

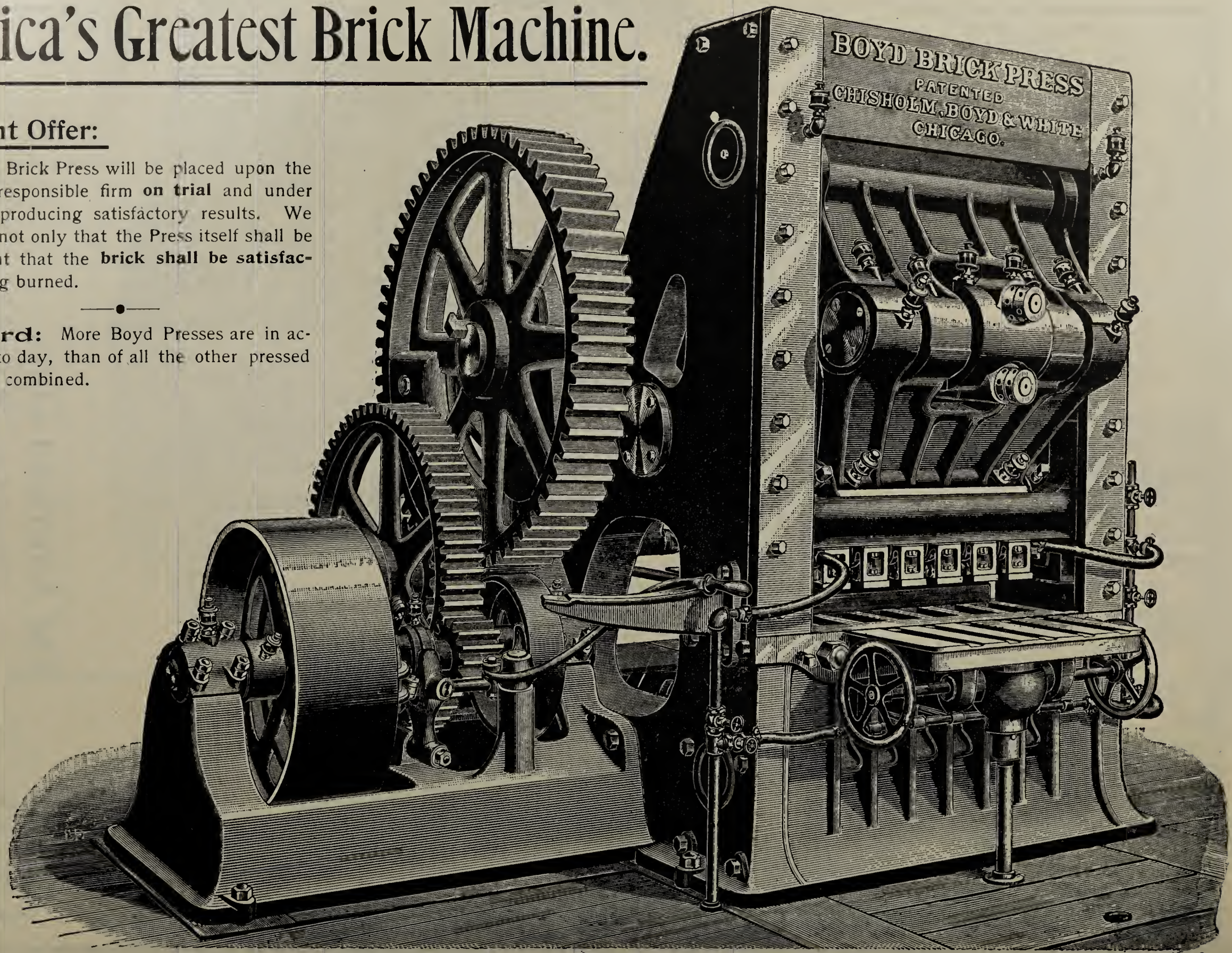
BUCYRUS, OHIO, U. S. A.

America's Greatest Brick Machine.

A Straight Offer:

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.

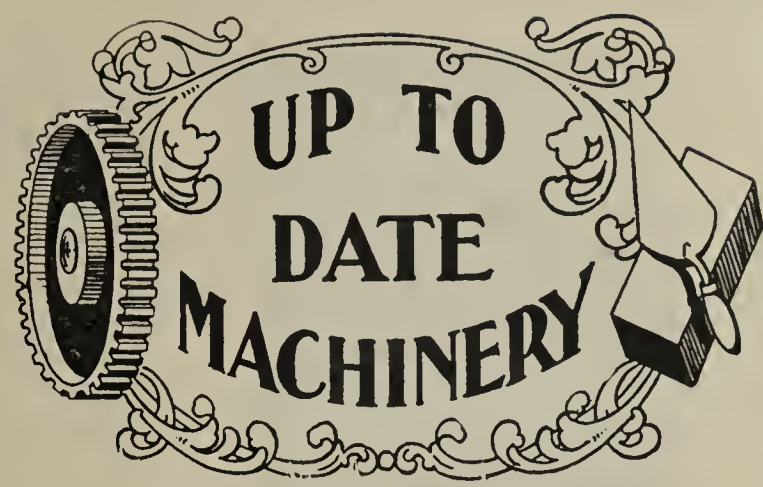


OFFICE AND WORKS,
57th and Wallace Streets.

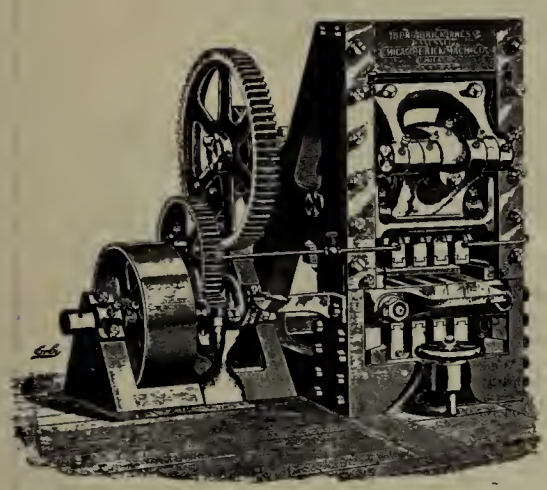
Cable Address:
"CHISHOLM, CHICAGO"
A. B. C. Code Used.

CHISHOLM, BOYD & WHITE CO., CHICAGO. U. S. A.

When Buying a New Machine



Why not get it strictly **Up-to-Date.** In no other line of industry, excepting perhaps the electrical, has there been so many and such radical improvements during the past few years as in Clayworking Machinery. The dull times have been utilized to good advantage in perfecting our machinery, and the buyer of to-day gets the benefit. Why put in a Back Number, when an Up-to-Date Machine costs no more?

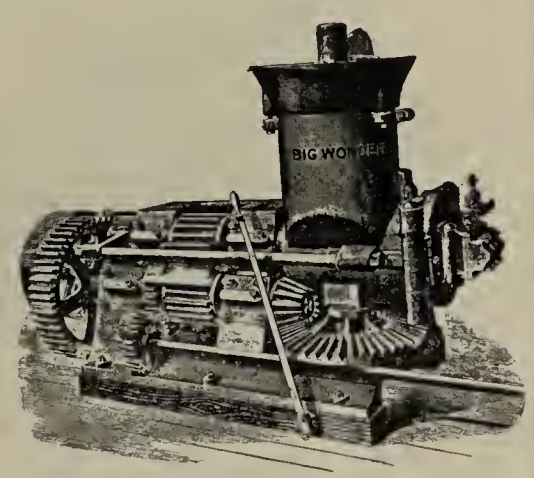


Dry Press Machinery.

Our BERG PRESS is the simplest and strongest of all Dry Presses. Three distinct pressures; absolutely unbreakable in pressing clay. Makes Shape Brick as easily as Standards, and is making in regular work blocks 18x13 inches. Specially adapted to Fire Brick and Fire Clay Shapes. **Fully Guaranteed** in every respect.

Send for Special Dry Press Circular.

Stiff Clay Machinery.

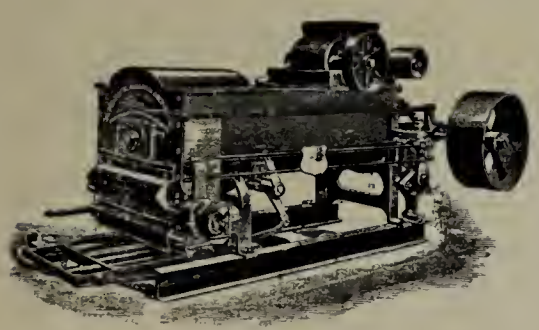


Our WONDER BRICK & TILE MACHINE is the most modern and improved type of Auger Machinery. Turns clay at Right Angles while in motion, breaking up and destroying laminations. Specially designed dies and augers to prevent laminations. Works many clays that cannot be worked on other auger machines.

Built in four sizes, capacities up to 100,000 per day. Makes Drain Tile equally well and equally rapidly.

Full Line of Cutting Tables, Crushers and Stone Separators, Pug-Mills, etc., adapted to all kinds of clay.

Send for Special Illustrated Catalogue.



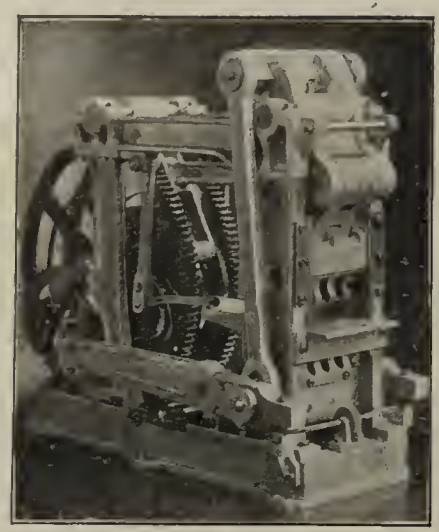
Soft Clay Machinery.

Our HORIZONTAL COMBINATION MACHINE is the latest and highest development of the Soft Clay System for making Sand Molded Brick. Works clay direct from bank, doing away with all soak pits and tempering.

We also have Upright Machines for working clay that has previously been soaked, and Horse Power Machines for small yards.

CHICAGO BRICK MACHINERY CO.,

Send for Illustrated Catalogue. **225 Dearborn Street, CHICAGO, ILL.**

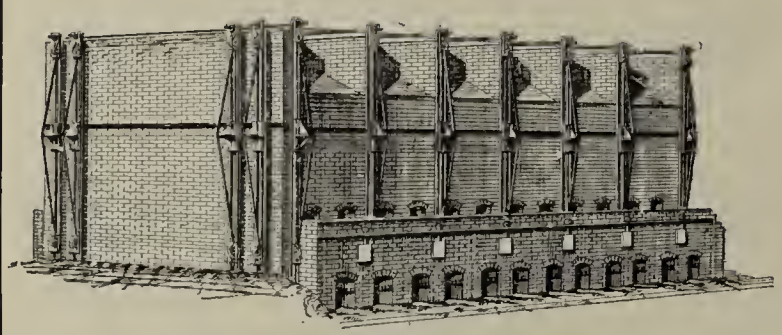


The GRATH DRY CLAY BRICK PRESS.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

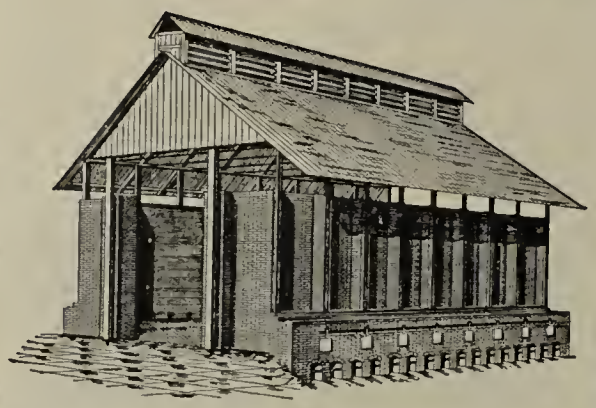
Features:

1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Requires less power to Operate.
5th. Brick free from Granulation.
6th. All Bearings Bushed.
7th. All parts Accessible.
8th. Thickness of Brick Changed without Stopping.
9th Master Wheels Close to Bearings.
10th. No Working parts under Lower Cross Head.



The GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH GRATH GAS AND COKING FURNACES ATTACHED Built Round, Square and Continuous. Perfect results guaranteed. No soft, overburned or flashed brick, uniform throughout.

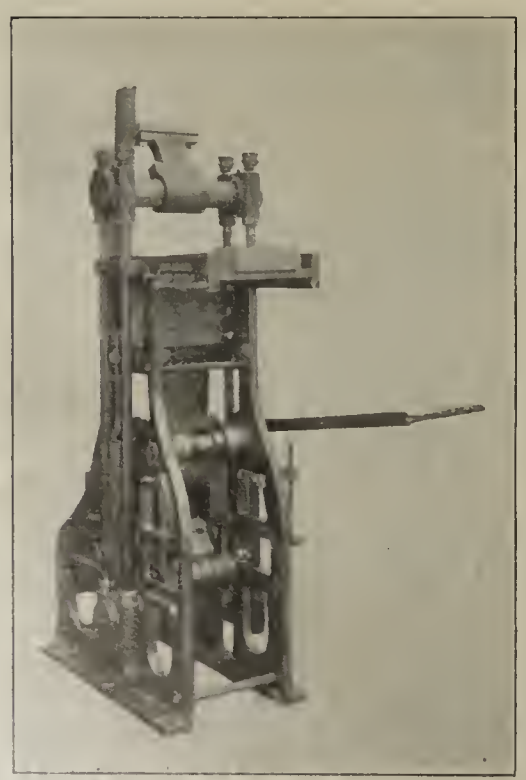


The Grath Up-Draft Kiln.

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with slack coal, with better results than lump coal in ordinary Furnaces and without any black Smoke.

The Grath Gas and Coking Furnaces

Can be attached to ALL kinds of Kilns, either old or new, and produce better results with SLACK than lump coal in ordinary furnaces. PROTECTION GUARANTEED TO ALL USERS. WILL PROSECUTE ALL INFRINGEMENTS.



The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK. The only successful Press of its kind in the market.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

The Coffeyville Vitrified Brick and Tile Co.

MANUFACTURERS OF

Repressed Vitrified Paving, Building and Face Brick and Drain Tile

Plants at Coffeyville, Cherryville and Independence, Kan. Daily Capacity 325,000

W. P. GRATH, Pres., Coffeyville, Kansas, April 30, 1900.

The ILLINOIS SUPPLY & CON. CO., ST. LOUIS, MO.

DEAR SIR—Replying to your favor of the 24th inst., we are very much pleased to state that the Hand Power Press which we purchased from you is giving perfect satisfaction, and is making a very fine grade of ornamental brick, with less than half of the expense and more than double the capacity of the screw press.

Wishing you success in the sale of this machine, we are

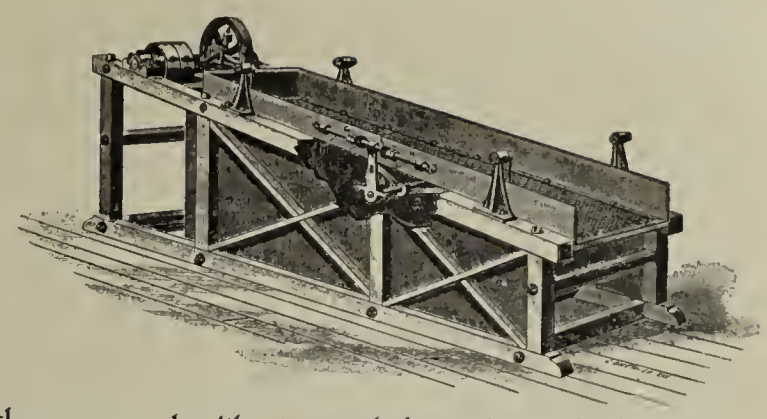
Yours very truly, THE COFFEYVILLE VITRIFIED
Per W. H. MAHAN, Gen'l Mngr. BRICK & TILE CO.

For Further Information and Catalogue on Above, address

The Illinois Supply & Construction Co., ST. LOUIS, MO., U. S. A.

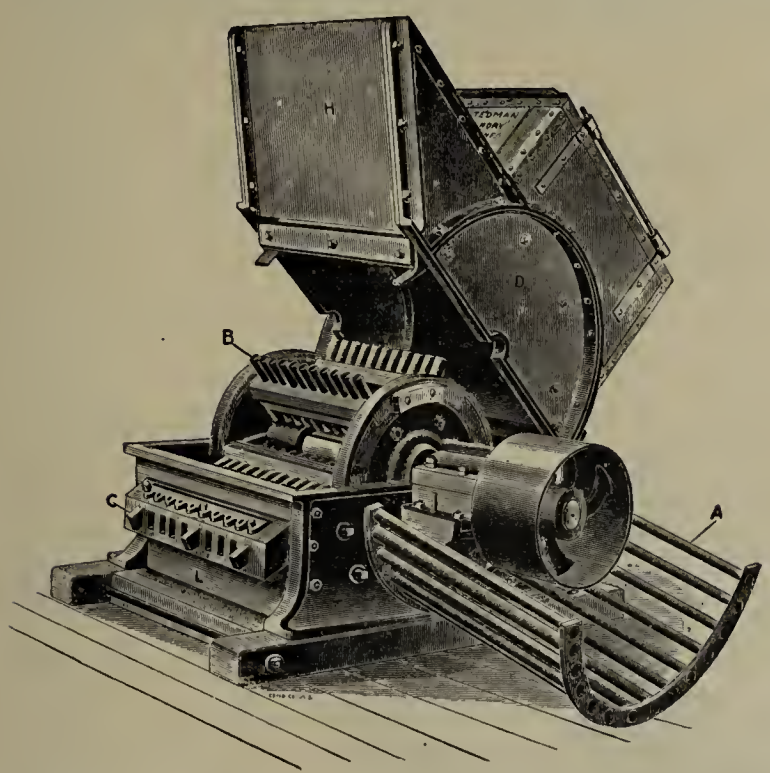
Mention The CLAY-WORKER.

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.



A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel.



STEDMAN'S CYCLONE CLAY PULVERIZER.

For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

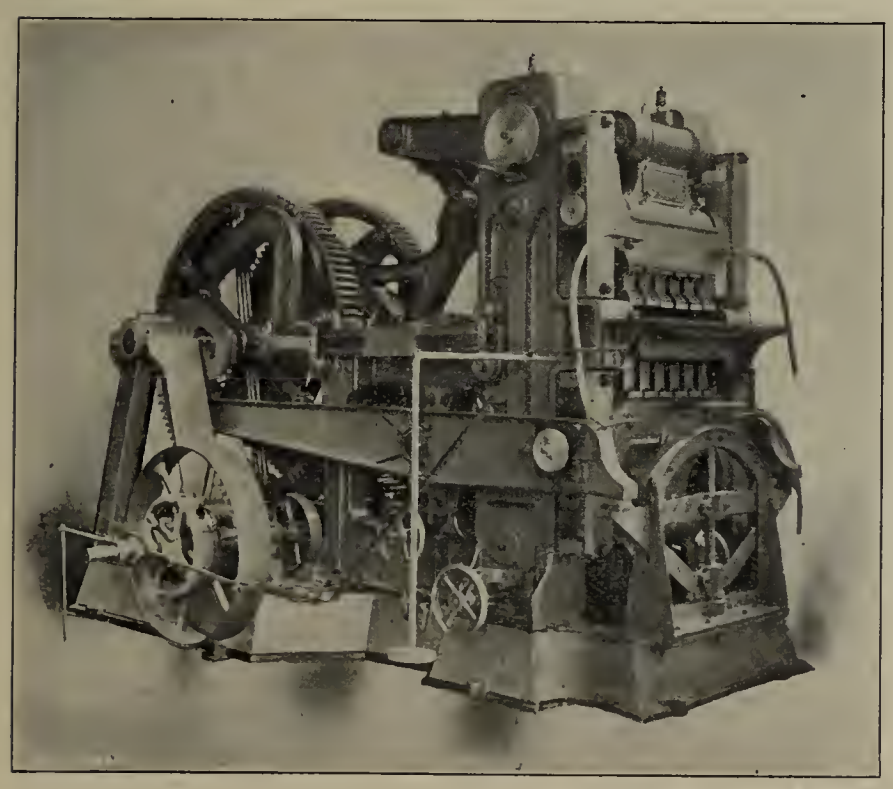
Write for catalogue, giving full description, references and testimonials.

Stedman Foundry and Machine Works,

Aurora, Indiana.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, SIMPLICITY and SERVICE.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market.

All parts subject to strain are made of the best Bessemer steel.

Fitted with the Fernholtz Mold Box. Undoubtedly the leader.

We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer,** in our own factory.

Dealers in Brickyard Supplies.

THE FERNHOLTZ BRICK MACHINERY CO., St. Louis, Mo.

Gentlemen:—In reply to your letter, as regards your Dry Press Brick Machine, I have had one in use in Houston, a Four-Mold, for nearly three years. I am entirely satisfied with it. As to repairs, I have not had any, and now having decided to put in a Dry Press in my Austin Plant, as you are aware, I have bought of you, another four-mold Fernholtz Dry Press, Pulverizer and Mixer. I take pleasure in recommending your machine and Company. Respectfully yours, M. BUTLER.

Further Information on Application.

The Fernholtz Brick Machinery Co.,

CABLE ADDRESS "FERNBRICK." WESTERN UNION CODE.

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

Write for Catalog.

The Standard Brick Drier.

There will be more money in your business if you use a good artificial Drier than if you depend upon old Sol, and there will be still more in it if you use **The Standard.**

The Standard Drier is reliable. It is not an experiment. It has a record of success not approached by any other. It dries all kinds of clay products **uniformily, rapidly and at least cost.** If that is the kind of a Drier you are looking for, write us.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

Send for Testimonials.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., OCTOBER, 1900. No. 4.

Written for THE CLAY-WORKER.

A BRICK, BRICK PLANT.

The Solution of the Problem of Reasonable Fire Rates.

IN THE TRITE words attributed to Bre'r Gardner, "The world do move." This now holds good as to the brick end of the world, as well as any other portion of it, as is illustrated by the accompanying views of a brick office erected by a brick company at their brick plant. This, perhaps, ought not to be a remarkable incident, but it is certainly unusual. The truth is that brickmakers have not used their own materials for the building of their factories and homes as generally as they should.

Like the shoemaker who allows his own children to run barefooted, the brickmaker has, as a rule, been content to build for himself of wood and other short-lived materials. The result has been a ramshackle character of structure, which fortunately, or unfortunately, according to circumstances, seemed doomed ultimately to go up in smoke. If there was enough fire insurance to pay for new buildings, etc., the fire ofttimes proved a blessing in disguise, in that it enabled the building of a more convenient and better equipped plant. Better equipped with machinery and appliances, we mean, for in the majority of cases the buildings themselves were the same wooden affairs.

OFFICE OF THE PURINGTON PAVING BRICK COMPANY, GALESBURG, ILL.

This was the old order of things. Now a new and better order is to prevail, for the brickmaker is learning that it is better and cheaper, too, in the long run, to use his own products instead of patronizing the lumberman.

—Clay from Top to Bottom.—

The splendid structure which we picture is the new office of the Purington Paving Brick Co., Galesburg, Ill. But for stone trimmings, the use of which the company now regret, for they realize that terra cotta would have served a better purpose, the building would be a clay structure literally from top to bottom, for it is roofed with Ludowici tile, than which there is none better, and the foundation is of vitrified paving brick, a material, we may remark, that is becoming very popular with architects for foundation purposes.

The walls are faced with their "Continental" non-absorbent building brick, another of their products which is gaining favor with Chicago architects and builders. The corner ornaments are made of these same brick, rock-faced. The handsome and substantial appearance of the exterior of the building is very pleasing. The interior is still more so.

The entrance door opens into the main office, a spacious, well-lighted room, with hard wood floors, and wainscoting of oak. To the left is the shipping clerk's desk, upon which in our illustration rest the pedal extremities of the president of the company, D. V. Purington. Next is the desk of the superintendent of the sales department, Mr. Frank Matteson. To the right of the entrance there is, first, a tidy lavatory, then a large fireproof vault, and beyond this the bookkeeper's desk. In the rear there is a series of private offices for the general

manager, W. S. Purington; the secretary, C. H. Chamberlain, and the cashier and stenographer. The fixtures and furnishings, while not rich, are neat and tasteful.

—An Unusual Feature.—

In the basement there is a kitchen and dining room equipped with all the necessary paraphernalia for the preparation and serving of a good dinner. We say "good dinner" advisedly, for we have partaken thereof. The works being located at the

The Boss and the Office Force.

end of the street car line, the officers have found that during the busy season (and of late all seasons have been busy with them) they could not spare the time to go home at noon, and growing tired of cold lunches—even the "full dinner pail" does not always satisfy—they determined to arrange for something better. The plan has proven very satisfactory, for the very good reason, perhaps, that the bookkeeper, Miss Fay, and the stenographer, Miss Burmood, have developed decided talents in the culinary line—the Purington Paving Brick Co. are fortunate in many ways.

The office, as a whole, is, we are inclined to think, considerably ahead of anything in the brickyard line in the United States. If any of our readers or contributors know of any that they think as good, or better, we will be pleased to have them send photos for illustrative purposes.

—The Busiest Year in Their History.—

So far 1900 has been the busiest and most prosperous year in the company's history. Notwithstanding the fact that they began the season with a good supply of brick on the yards, and have been running full-handed, turning out 5,000,000 brick per month, the demand for Purington paving brick has been sufficient to take all their brick. Grass is growing on their yard where in former years paving brick were usually piled. They have been shipping at the rate of fifty carloads of pavers per day for months past, and now have orders on their books for twelve millions—enough to keep them going full-handed until long after snow flies.

The Puringtons believe in things strenuous. They think their present prosperity is due largely to the present administration, and consequently are anxious for another four years of McKinley and prosperity, and boldly declare their belief by campaign posters displayed at different places about the works. As a reason for the faith within him, W. S. Purington, the general manager, submits the following figures:

"In 1895 we paid out in cash for labor, $60,547.62; in 1896, $53,407.94; In 1899, $118,713.11, and in 1900 (at the present average), $144,577.83.. Wages paid in 1899 and 1900 were 12½ per cent. higher than in 1895 and 1896. Our business is growing very fast, and I think will continue so long as people have confidence in the administration."

From this point of view these are certainly good reasons. However much any of his fellow brickmakers may differ with "Will" as to politics, not one who will visit this great plant but will concede readily that he certainly knows his business when it comes to making vitrified street pavers.

—How the Brick Are Made.—

Unfortunately, it rained most of the time while were at the plant, so we were unable to use our camera, but as the plant has been described and illustrated in The Clay-Worker in the past, we can content ourselves with brief mention of the recent improvements, which are chiefly in the drying department, though an important change has been made in some of the buildings. All of the wooden portions of the buildings have been removed and brick walls substituted. This gives them a fireproof plant, and they are no longer worried by the specter of the fire demon, and their fire insurance rates have been reduced to a minimum—of itself no small item. At both plants they have introduced a system by which the hot air is taken from the cooling kilns and forced into their tunnel dryer. For this purpose fans are used. They were furnished by the American Blower Co., of Detroit, Mich., and while run at a very high rate of speed continuously for weeks at a time, they are adjusted so accurately that they require little or no attention. The heat is taken from the top of the kiln into immense iron pipes (five to six feet in diameter), and discharged into the dryers at a temperature of about 300 degrees. The brick are dried thoroughly without any checking or difficulty whatever in twenty-four hours.

The brick are burned in square down-draft kilns, one-half of them of the Eudaly pattern. They now contemplate building two new kilns with improved methods of staying the kiln walls with iron braces, that they hope will be an improvement. The strain on the walls of a kiln in which pavers are burned is something enormous, and it speaks well for the Eudaly kilns, which have been in operation since the plant was first erected, and are still in almost constant use.

In addition to their paving brick and block, and their "Continental" vitrified building brick, they also make a fine sidewalk brick, for which there is a constantly growing demand. The output of the plant is of immense value, and the importance of the works to Galesburg is recognized by every citizen.

An After Dinner "Smoker."

We were impressed with the idea that Purington is a household word by the following incident: Arriving at the station at dusk, we were dazed by the racket of a number of 'busmen, each yelling at the top of his voice, "Free 'bus for the Blank House," "Free 'bus for the Blank Hotel," and our hesitation made us the target for the whole pack. Resisting their at-

tempts to get hold of our grip, we finally asked, "Which hotel does D. V. Purington stop at?" The answer came quick, "At the Union Hotel, of course." So to the Union Hotel we went, knowing that if "D. V." stopped there it was the best in town.

WRITTEN FOR THE CLAY-WORKER.

THE TRUSTS AND THE SMALL BRICK FACTORIES. II.

THE BRICKMAKERS could be kept busily engaged in pushing their forces to make enough bricks to supply the demand, they would never for one moment give a thought to the subject of combinations, agreements or trusts. But the time has been, and doubtless will come again, when the most conservative of us will think upon such things.

Taking it for granted, then, that the factories that supply our large cities will sooner or later be formed into one corporation and placed under one general management, the question is narrowed down to the subject which we have in hand, Will the trusts absorb the small brick factories?

If there should ever be an arrangement of the large factories, as suggested above, there can be no doubt that the attempt would be made to either absorb the smaller concerns, or to crush them by severe competition. Whether we can withstand

Secretary C. H. Chamberlain, D. V. and W. S. Purington at Leisure.

the onslaught of such formidable opponents is a question that is difficult to answer at present. But in view of the fact that our interests are so great and constantly growing greater, it is the sensible thing for us to consider these matters seriously before putting more money into our business. The writer does not know of one single small factory but has made, during this season, some very substantial improvements in its outfit, either of machinery, kilns or dryer.

Not only are all that were in operation last year making these improvements, but the factories that have been closed for several years have been purchased by substantial companies and refitted for this season's work. In addition to this, many new factories have been erected to assist in meeting the wonderful demand of the year 1900, or it may be to help force prices down to the same old starvation figures we have been enjoying for the last five years. In view of these facts, and taking into consideration our past experience of overcrowded markets, is it not well that investors in brick machinery should consider well the pros and cons of the situation before placing too much money into the business? Is there not danger that we are now making preparations to celebrate our own funerals?

There is not among the list of my acquaintances an owner of a small factory but who is opposed to ever surrendering his plant to a trust. Each man feels a pride in his outfit, and is all the better brickmaker because his individual efforts are necessary to make matters move in the proper course. His own name appears at the head of the firm, and he is proud to show the wares that bear his individual stamp. Talk to such a man about trusts and his manhood is insulted at once. But he is increasing his capacity, you are increasing yours, and I mine. When we oversupply the market, he will cut prices, you will cut prices, and I will do the same. We will all lose money, perhaps one or all of us will fail, and the men who succeed us may have a different opinion of trusts. Should that be the case, the trusts will find smooth sailing in extending their territory. They will select the cheapest plans for accomplishing the desired end. They will buy some of the plants and attempt to starve the rest out of the business, and soon the entire territory will secure their supplies of brick and tiles from factories situated more or less distant, according to the location in regards to great centers of manufacture.

But should some sturdy plants refuse to sell to the trusts, are there any circumstances that would indicate that they might have a fighting chance against their gigantic foes?

They can expect no assistance from their customers, however much the interests of these customers may be affected by the change. It is a noted fact that the common people will purchase of a trust because of a few cents advantage in prices at the present, even if they knew this course would kill competition and eventually fasten upon them much higher prices. The only chance for these local factories is to meet all competition in prices and quality. Can they do this and have a margin of profit sufficient to pay them to take the risks?

We believe it can be done, but in order to do it, the local factories must be equipped with the best of labor saving appliances, kilns of the best pattern, fuel and first-class raw materials in close proximity, and have some advantage over their opponents in the labor market. Unless they enjoy most of these advantages it would be useless to attempt to compete in the open market with their formidable rivals.

First, let us consider labor-saving appliances. Every time the clay is handled adds just so many cents per thousand to the total cost of the finished product. It would surprise most brickmakers to count the number of times they handle the clay from the clay bank to the kiln. So little thought is given to this important subject in the erection of our small factories that it deserves to be discussed more in detail than we shall attempt to do here.

It is no uncommon thing to find the clay bank one-half mile from the factory. The clay is gathered and delivered by the most costly methods known to man—shovels, horse and cart—and stored so far from the pug mill that the whole costly process of gathering the clay has to be gone over the second time with shovels and wheelbarrows.

Our small factories cannot afford to use steam shovels, but when the clay is once loaded into dump cars it should go straight to the pug mill or crusher, be dumped automatically, and then the engine should do the rest, crush, screen, pug, form into bricks and deliver them upon the offbearing belt, thus saving the labor of from three to five men, as one often sees employed in many of our small factories.

Unless the manufacturer gives this matter his closest attention, and reduces his expenses along this line, he can have but little hope of success in the struggle for existence that is bound to come within a few years. L. C. MOORE.

The Season.

Dame Nature dons a bright new dress
  In the spring, or thereabout;
In summer wears it rusty,
  In autumn wears it out.
And after that she goes to bed;
  For obviously there
Is nothing else to do, since she
  Has not a thing to wear.

BRICKMAKING IN COLONIAL DAYS.

THE FIRST brick used in the colonies were imported from England and Holland, and were used for the official residences of the governors and other dignitaries. However, the art of brickmaking was learned by the early settlers and substantial brick houses were soon built from brick manufactured in this country. The first brick kiln in New England was set up at Salem, Mass., in 1629. The general use of wood for building purposes in early colonial days was responsible for numerous destructive fires, and in some of the towns the building of wooden structures was restricted.

The first brick house erected in Boston was built by a Mr. Coddington, in 1638. In 1643 a watch house was built of brick in Plymouth, the brick being furnished by a Mr. Grimes at eleven shillings a thousand. In 1692 an order of the general court of Massachusetts required that all buildings of a certain size be built of stone or brick, and to be roofed with slate or tile.

The last brick were imported into Massachusetts from England in 1629. In New York bricks were imported from Holland for some time and brickmaking was introduced there by the last Governor Stuyvesant. Before this time brickmaking had been begun at the Van Rensselaer estate, a few miles below Albany, and between 1630 and 1646 the product of these kilns was sold at fifteen florins a thousand.

West of the mountains brickmaking was engaged in more than a century and a quarter ago, and there are still standing many of these old-time brick structures, upon which have been lavished much material. While in these latter days this is considered a useless waste, yet these old buildings have proven the wisdom of their early builders. The first brick house built west of the Alleghenies was erected at Kaskaskia, in 1750, and this old house is still standing. Kaskaskia was founded by the French in 1682, and was the capital of the Illinois territory under the French. The bricks used in the old brick house erected there were manufactured at Fort Du Quesne, now Pittsburg, or nearby. But as this was four years before the erection of the French stronghold at the headwaters of the Ohio, it is to be supposed that French historians are in error as to the exact place where this early brickmaking was carried on. However, the English made brick at Pittsburg in 1760, ten years later, and these were used in the defenses constructed there by Colonel Henry Bouquet. GILBERT.

Fig, 7. Vitrified Block Paving on Woodland Avenue at 52nd St. Laid in 1897.

WRITTEN FOR THE CLAY-WORKER.

VITRIFIED BRICK PAVEMENTS IN PHILADELPHIA. III.

By Harrison Souder, Civil Engineer. *

PHILADELPHIA is a charming city, containing many beautiful suburbs and parks, handsome buildings and places of historical interest dear to all Americans. She has also well-paved streets, making all these various objects easily accessible. The older or central part of the city is largely paved with asphalt or granite block, but in many of the newer sections vitrified brick predominates. Especially is this true of West Philadelphia.

Coming in from Darby, over the old Philadelphia and Chester pike, now Woodland avenue, one crosses the county line at Seventy-second street on an old stone bridge, the roadway of which has been modernized with a pavement of brick. This paving is with the small sized brick and continues on Woodland avenue to Sixty-second. This brick has been in service from eight to ten years. The illustration given in a previous article shows that it has stood up quite well. At Sixty-second street the vitrified block paving begins and continues to Fiftieth street. These are yellow West Virginia blocks, laid in 1897. They are yet in splendid condition. The photograph (Fig 7) is a view of this paving at Fifty-second street. Most of the intersecting streets we have passed are paved with brick. Turning the corner at Fiftieth street and again at Greenway avenue we continue on brick to Forty-ninth street, crossing the bridge over the Philadelphia & West Chester Railroad. This bridge, as well as the street, was paved with brick in 1896. As the photograph (Fig. 8) clearly indicates, this paving is yet in excellent condition. Reaching Springfield avenue, we are riding again on some of the early brick paving, a view of which has already been given. Any way we turn now we are still on brick, most of it to the north and west having been laid in the last two or three years. Nearly this whole district, which is one of the prettiest sections of the city, is paved with vitrified brick. A majority of the houses, too, are faced with a light colored vitrified brick or with Pompeiian brick, and have porch and garden fronts. The effect is certainly pleasing. Continuing across West Philadelphia we leave brick paving at Forty-second street and meet it again at Thirty-ninth and Hamilton streets, which last street is paved with brick as far as Thirty-second street. Both Forty-second street north of Market and Hamilton street were among the first attempts at brick paving, and have been in a poor condition for several years. The foundation is gravel. Some years ago both streets were repaired in spots. They are at the present time good illustrations of the fallacy of laying inferior bricks on a weak foundation, and also of patchwork repairing. Both streets should be entirely repaved, in a modern manner. Following the wide vitrified block gutter; if we will, on the Thirty-fourth street driveway through Fairmount Park, and, crossing the Girard avenue bridge on asphalt, we are in older Philadelphia, and, excepting on Jefferson street, we find but short stretches of brick paving until we reach Tioga, Germantown or Frankford, where considerable brick has been laid, Figure 9 is a photograph of Chelten avenue, near Wayne avenue, in Germantown. This street was paved with a Perkiomen red shade brick in 1895, and is in very good condition.

Several of the City's bridges are paved with vitrified brick. Two of these we have already mentioned. Figure 10 is a photograph of the new bridge at Fifteenth street over the Pennsylvania Avenue Subway, and shows the neatness and good character of the brick paving which was placed on the bridge in 1898. While speaking of the subway, which is a piece of engineering of which the citizens of Philadelphia may well be proud, it is interesting to note that the boulevard constructed over the tunnel from Hamilton street to the park entrance has been paved with asphalt, with two-feet wide strips of red shale brick paving at the gutters. This method of using brick and asphalt is also in use in Washington, D. C., and is commendable, as it prevents the rotting of the asphalt along the curb.

Fig. 8. Brick Paving on Bridge at 49th Street over P. & W. C. RR. Paved in 1896.

Another admirable way in which brick is coming to be used in our city deserves mention, and that is its use on the sides of macadam roads in the suburbs and parks. The brick is laid from the macadam to the curb, forming at the same time a gutter and support to macadam and preventing the road from being washed out. These strips, three to six feet wide in most cases, make excellent bicycle paths.

Relative to paving the gutters along macadam roads, Chief Brooks, of the Highway Bureau, says: "* * * There is no doubt that the life of the road would be prolonged indefinitely if such gutters were placed on the sides, and in consequence good roads could be maintained at a comparatively slight expense, which otherwise would be subject to rapid deterioration and involving a large outlay to properly restore."

The advisability, indeed the necessity of such strips or gutters along macadam roads is apparent to any one who has had experience with such roads. The writer believes that specifications for macadam roads and also for asphalt roadways should call for gutter strips of vitrified brick or block in Portland cement grout, at least 36 inches wide in macadam roads and 24 inches wide in asphalt roadways.

This is the era of "trusts" and asphalt, being found in comparatively few places in the world, the supply is easily cornered and combinations formed to "boost" the price. An asphalt trust has lately been formed and prices for asphalt paving in Philadelphia were $1.00 per square yard higher in 1899 than in 1898, and are even higher this year. Bricks cannot be cornered so easily, and through competition the price gradually decreases. Hence, another argument in favor of a good vitrified brick for paving purposes. The diagram (Fig. 11) shows the range in prices since 1887 for the various forms of improved pavements laid in Philadelphia. It is interesting to note that roughly the lines are parallel, but with the greatest variations in sheet asphalt. The general rise in all prices in 1893 was due to the introduction of concrete foundations for all pavements. The present prices for paving on concrete are much below the original cost for paving on a gravel base.

Philadelphia is now one of the best paved cities in the world, and under the present administration, with Mr. William C. Haddock as Director of the Department of Public Works, and Mr. William H. Brooks, Chief of Bureau of Highways, the good work is still going on.

The progress in laying improved paving in Philadelphia is clearly shown in the tables below, which give the total amounts of paving and the percentage of each class at the end of the years 1884, 1889, 1893, 1896, 1898 and 1899. The record for vitrified brick paving is most encouraging; with no brick paving at all until 1887, in which year five miles were laid, and rising to a total at the end of 1899 of 119.52 miles, or 11.38 per cent. of the total paving of all kinds in the city. Street paving at end of 1899:

Fig. 9. Chelton Ave. East of Wayne Ave., Germantown. Paved in 1895.

	Cobble and Rubble	*Granite Block.*	*Vitrified Brick.*	*Asphalt*	*Macadam.*	*Slag Block and other Material.*
Miles.....	112.49	352.16	119.52	254.11	193.58	18 34
Percentage.....	10.72	33.53	11.38	24.20	18.43	1.74

Total number of miles..... 1050.20

The total length of streets and roads opened and in use is 1,480 miles.

Figure 12 is an interesting view of an intersection at Forty-fifth and Chestnut streets, where the modern asphalt and vitrified brick paving meet the ancient nerve-racking rubble work. Improved pavement has since replaced the rubble.

In closing this article the writer would state that he does not wish to be understood as deprecating the value of improved pavements other than vitrified brick. He believes that asphalt is one of the best paving materials and has a place of its own. Granite blocks are also useful at times, though rough and expensive. Where, however, a good smooth, durable, sanitary pavement, at low cost, is wanted, it can be obtained with vitrified bricks or blocks laid on a concrete foundation. This fact is being appreciated more and more, not only in Philadelphia, but all over the country.

(The End.)

Fig. 10. Bridge at 15th Street over Pennsylvania Avenue Subway. Showing brick paving laid in 1898.

Written for The Clay-Worker:

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 12.

BY ALFRED CROSSLEY.

FIRST AMONG FIRE BRICK made from other materials than fire clay, is the silica brick. Pure silica stands next to alumina in refractoriness, and, in fact, may be said to be infusible, while its property of expanding under heat renders it for certain purposes very valuable. For the manufacture of silica brick, the material must be as nearly as possible pure silica, probably not less than 95 per cent. The reason may be found already discussed in speaking of silica in relation to other substances and its action in combination.

—The Introduction of Silica Brick.—

The original silica brick was called "Dinas" brick, from the local name of the rock in Wales, from which it was first made, and this name to some extent attaches to it still. In a description of this rock it is said to be believed to be the millstone grit of the carboniferous system, and the geological equivalent of the bed termed ganister, at or near Sheffield, England, which is used there in the manufacture of this class of brick on a large scale, and is probably again represented by the beds of silica stone, likewise called ganister, which come out at the surface on some of the hills in Durham and North Yorkshire and also made into the same class of brick, though of not so good a quality.

The original silica, or "Dinas," brick were claimed to be first made by Mr. W. Weston Young, a land surveyor, of Newton-Nottage, Glamorganshire, Wales, who formed a company for their manufacture in 1822, and who has left an account of the history of the enterprise, from which I make a few extracts, as follows:

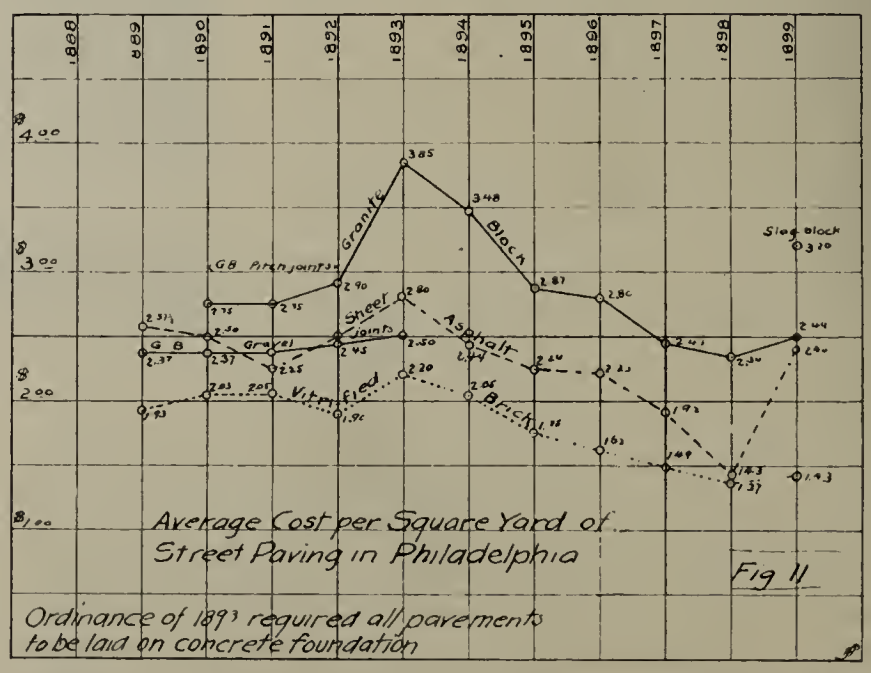
"The material at the Dinas (the well-known rock of that name, in the vale of Neath), from which we procure it, is nearly pure silex, but from it lying on the limestone and occasionally intermixing with it, there is, taking the average of the general working, perhaps about 5 per cent. calcareous matter and 1 per cent. of metallic, either iron or copper.

"Its use as a sand was discovered about forty years ago (this account was written about 1834), when the finest of it was taken to one of the copper works and used as a cement and for mending their furnaces while at work, by placing it, with a long-handled ladle or spade, where the wash of the metal had destroyed the brick, and from its remarkable property of swelling in high heats, it fixed itself firmly. It gradually gained from one copper works to another, till its use became general; in fact, they are not able to find any other sand that will answer the purpose so well. Its fire-proof qualifications being known, many attempts were made to produce a brick from it, but all the combinations of different clays, etc., failed. About fourteen years ago (that would be about 1820) I became acquainted with it, and soon after devised a method of producing a brick from it of very extraordinary fire-proof qualities. When set in its own cement, for very high and long-continued heats, it certainly will exceed in duration any other known brick."

The following is an analysis of the rock from which these brick are made:

Silica	98.31
Alumina	.72
Peroxide of iron	.18
Lime	.22
Alkalies	.14
Water (combined)	.35
Total	99.92

These brick are largely used in the construction of copper furnaces, and also in the roofs, ports and other parts of the Siemens open hearth steel furnaces, where the most intense heat occurs. It is said they will last six weeks in the roof of an ordinary reverberatory furnace, at a temperature of not less



than 2,200 degrees Cent. (3,992 degrees Fahr.), and in that period will be reduced from nine to two inches by abrasion of the flame and dust and partly from chipping. They conduct the heat so badly that at this great temperature, which is a bright white heat in the interior of the furnace, the exterior is not more than pleasantly warm to the touch of the hand. While they will stand continued exposure to a clear white heat, they cannot be used for the hearths of furnaces, cupola linings, etc., where they would come in contact with the metallic oxides, basic slags, etc., for reasons previously mentioned. It is also said that the effluvia from some lead ores exerts an injurious effect upon them.

The method of manufacture was long made as much as possible a mystery, and so rigidly was the great secret guarded that men in possession of it carefully locked themselves up in the workshops before making the mixture. It is not very many years since the knowledge became public. In some places the method has been to first heat the rock or quartz in quantities of twelve or fifteen tons in a Rumford oven, then being thrown into water, to break it up, and ground under iron rollers to a coarse powder. At other places the rock is simply broken up to a similar size and then ground in a solid bottom pan under rollers weighing about three tons each, and during the crushing lime cream (a thin paste of lime water) is added to the pan for incorporation with the ground silica, the proportion of lime being about 1 to 2½ per cent. The mixture so obtained is then pressed in iron molds, somewhat smaller molds than the finished brick is required to be, as they expand in burning, so that for a nine-inch brick it requires to be made only 8¾ inches. When made they are very tender and require careful handling. They are pressed on iron pallets with feet, on which they are then transferred to be be dried on a steam or furnace-heated floor, usually the former, and burned in down-draft kilns, holding 30,000 to 35,000. From five to seven days' hard firing are required, and about as many more for cooling, when they are ready for use. The principle on which the fragments of crushed quartz, of which the brick are composed, are held together is that the lime exerts a slightly fluxing action on these particles of quartz, and so causes them to bind or stick.

These brick have for many years been imported in considerable quantities into this country from Wales, long the only source of supply, for use in the steel works and glass works, but they are now successfully produced by two or three firms in Pennsylvania, and of a very superior quality. At one of these places, I understand, they were being made on the dry-press system. There is no lack of material for silica brick in many parts of the United States, and their manufacture will doubtless be extended into other localities, as the steel business still further develops and makes a call for them.

—The Method of Manufacture In Austria.—

A somewhat different variety of silica brick was a few years ago made in Styria, a province of Austria, and, I presume, are still being produced. The originator of these was Mr. Joseph Kherns, the well-known Austrian metallurgist, of Kapfenberg, Styria, who published a detailed account of their manufacture. In this process the silica employed is in the form of pure quartz, and the binding material used is a very pure fat clay. In this consists the essential difference between the Styrian and most other slica brick. The quartz selected is as free as possible from iron, mica, feldspar and other foreign matter, in short, the purest that can be obtained. It is heated for ten or twelve hours in kilns, and when it has attained a bright red heat is thrown into water, in order to render it friable. It is then hand picked and divided into two grades, the purest portion being reserved for the most refractory brick. The lumps are then crushed by stamps or till hammers, weighing 250 pounds each, and capable of crushing three and one-half tons of burned quartz in twelve hours. After being crushed, the quartz is sifted through a sieve of about sixty meshes to the square inch. The clay used is of two varieties, differing slightly in plasiticity. Its composition is not stated. It is very carefully prepared by thorough weathering, pulverization under light stamp heads and fine grinding under edge rollers, and is finally sifted through a sieve of 600 meshes to the square inch. Three qualities of brick are made. The mixture for the best quality, in which only the purest quartz powder is used, contains about 6 per cent., by measure, of one kind of clay, or 7 per cent. of another. In the mixture of the second quality the less pure quartz is used, or old burnt brick of the first quality reground, with the addition of about 6 per cent. of clay. The third class is made of a mixture of the powder of old brick of the second and third qualities, with 10 per cent., by measure, of raw clay. The ingredients are first thoroughly intermixed in a dry state, after which water is added, and the whole properly tempered or kneaded by treading under men's feet, though the latter is probably now superseded more or less by the modern pug mill or the wet pan. The first quality brick are made with a press in cast-iron molds, and are subjected to a pressure of about 3½ tons to the square inch. When ready for molding it must be capable of being worked into a ball in the hands without crumbling. The second and third qualities are made in open sheet-iron molds, the material being beaten in solid with a metal rammer weighing about 3½ pounds. The drying is done very carefully and slowly, in chambers, and about seven days are thus occupied before setting in the kiln. The size of the brick is 12 by 6 by 3. Small rectangular closed kilns are used, holding about 2,500 of these brick, and fired from one end. The greatest care is bestowed in burning them, which takes about seventy hours to complete, and a strong white heat is attained. After burning the kiln is tightly closed up for thirty-six hours, when it is gradually opened, and at the end of about sixty hours the brick can be drawn. These brick are said to be suitable for Siemens regenerative steel-melting furnaces.

Fig. 12. Three kinds of Paving at 45th and Chestnut Streets.

(To be continued.)

The advertiser who advertises periodically does not get the full value of his space. It requires more steam to start a train than it does to keep it moving.

Written for THE CLAY-WORKER.

CHIMNEYS AND "RIDDLE-BOTTOM KILNS."

Geo. S. Tiffany.

IN LOOKING over an old copy of The Clay-Worker, dated December, 1893, we noticed an article from the pen of D. W. Stookey, in which is copied a statement of mine made in an article in the October number, page 356, viz., "I have a friend who has a stack 110 feet high for five down-draft kilns, and he says, 'There's not a foot of it for sale.'" These kilns were located in the lower story of his works, and the heat from the walls of the kilns while burning and all the heat from the kilns in cooling (as the flue to the stack was closed by a damper) was discharged into the factory. This, with the heat from the boiler, was the only means of drying the ware and warming a large three-story factory, which it did effectually. It will be seen that the modern down-draft kiln "with small chimneys on its walls" could not have been used. Our friend's plan of his works is not a singular one. It is a common method of construction in most Eastern cities. No change of kilns could be made without introducing a system of drying by steam. Nor would any kiln with small chimneys on its walls be allowed within the corporate limits of any city on account of its creating a smoke nuisance.

In The Clay-Worker of September, 1899, "Press" speaks quite disparagingly of the "old-fashioned, honey-combed floor of our ancestors, styled riddle bottoms, * * * which experience and progressiveness have pushed to the wall, giving us a floor with the minimum of flues and the maximum of dead space. In fact, seem to fill the bill without flues at all." The riddle-bottom kiln was developed, we believe, for burning salt-glazed sewer pipe. We built such kilns thirty-seven years ago at Jackson, Mich., for this purpose. They were copied from kilns used at Akron, O., and we judge are as old as the sewer-pipe business of that section, for they were required to burn and salt-glaze the clay of that locality, so as to make a vitrified sewer pipe. We question if there is any more successful burning of clay ware in any branch of clayworking than is done by the "old-fashioned riddle-bottom down-draft kilns of our ancestors." It was a common practice thirty-seven years ago, and I know not how much longer, to set, burn to a salt-glaze and empty the same kiln every week, producing ninety-five per cent. of first-class pipe. The riddle bottom and stack are both essential to this result.

The saline vapors as they descend through the kiln must move over all surfaces that are salt-glazed, and a good stack makes the burning independent of the weather. No kiln "with little chimneys in the walls," and with floors having the minimum of flues and the maximum of dead space" could possibly perform the same functions. The down-draft kiln of our ancestors is not being "pushed to the wall," but a new kiln, containing its more valuable features, with such changes as the burning of vitrified paving brick, dry-pressed and face brick have found to be necessary, has been developed. It would be difficult to set with brick a riddle-bottom down-draft kiln, without obstructing to a great degree the openings in the floor, but as the brick are not salt-glazed, larger and a less number of openings will answer, and a better floor can be made for wheeling. The high flash walls and bags were required in the burning and salt-glazing of sewer pipe for the currents of heat and saline vapors must pass through the pipe in order to glaze the inside as well as the outside of the pipe, besides, a horizontal draft would certainly shatter the large sizes, warp the smaller ones and only glaze one side of the pipe or glaze the side toward the draft more than the opposite side. There is no salt-glazing done in the kiln for burning bricks, and bricks are not injured by side or horizontal drafts, hence the bags have been gradually reduced in height and set more open or abandoned altogether. We would not use them, for they interfere with the distribution of the heat along the walls of the kiln, and the heat can be directed toward the top or bottom of the kiln by the judicious setting of the bricks better than by regulating the openings in the bags. In an up-draft kiln the heat first attacks the bottom of the kiln, and rises through the bricks; in a down-draft it attacks the top and descends through the mass, but in this kiln that I have but partially described the heat envelopes the whole mass of brick as in a blanket—a most desirable consummation. With such a kiln for burning bricks no doubt little chimneys along its walls would work successfully, but no one would attempt to burn sewer-pipes in such a kiln.

It is not correct to say that the old kiln has given place to the new, for the old kiln is still a necessity, and each style of kiln is probably the best for the purpose for which it is designed. Indeed, we may congratulate inventors if the new fulfills its design as well as the old. The subject of kilns has been discussed in a general way under two headings, "Up-Draft" and "Down-Draft." The combined up and down-draft has been almost ignored, but should receive more consideration, and the kiln we have been considering—call it horizontal, draft or what you like—has merits which make it superior for certain purposes. The potter's kiln, with its cone-shaped top, forming a stack, and an upper chamber in which "grog" or "cement" is burned, by right of antiquity and distinctive construction, is certaintly deserving of its separate classification. Is it not strange that notwithstanding the vast improvements made in kilns by scientific (?) drain tile and brickmakers that the old fogy sewer pipe makers and potters still cling to their ancient designs! Pardon a little irony! We wish to show, if possible, the absurdity of discussing the subject of kilns without any reference to the work they are designed to do, and parts of kilns, oftentimes, without any relation to a complete design.

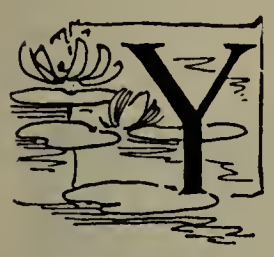
In building a stack for a well-proportioned down or horizontal draft kiln would not the best results be obtained by making the sectional area of the stack equal to the sectional area of the main flue of the kiln? We agree with Mr. Stookey that "the draft through a stack is estimated by the difference in weight of the column of heated air in a chimney and that of the column of the cool air outside of equal height and sectional area." That is good philosophy. Why should he lay down another rule which, while true in principle, is deceptive in its application, viz., "the amount that any blow-pipe or orifice will discharge in a given time depends both upon its sectional area and the velocity of the fluid passing through. From this Mr. Stookey concluded that my friend's chimney "might have performed the same functions, if it had been lower with a greater sectional area." In the case of a chimney "the velocity of the fluid passing through" all depends upon its temperature, and if the stack is made larger than necessary—much larger than the main flue of the kiln—the expansion of the gases as they enter the stack and the greater radiating surface of the stack will reduce the temperature of the air in the stack and consequently the draft. If not, then stacks and chimneys are of no use except to keep the smoke out of our eyes.

Mr. Waplington says in Clay-Worker, February, 1891, page 213: "Draft may be increased by increasing the temperature at the bottom of the chimney, and in this way make a low chimney as effective as a high one, but you must sacrifice fuel to accomplish it." Yes, we think one would have to sacrifice fuel to obtain it, and then would only partially succeed. What does the reader think of this from the same article: "The

immediate cause of draft is the difference in the specific gravity of the air at the top and bottom of the chimney. If the air at the bottom be lightened by heating it will ascend, and so long as this heating continues the draft will be maintained, but if the air at bottom and top are allowed to become equal in temperature, the natural draft will cease, and the air remain at rest until there is again a difference of temperature between top and bottom of the chimney." Here is a new rule which takes no cognizance of the temperature of the external atmosphere, the gravity of which is the cause of the draft, or our philosophy is a delusion. Having read Stookey and Waplington on chimneys, we would really like to know what Ben Franklin wrote upon the subject. We believe he wrote a small treatise on "How to Cure Smoky Chimneys." We have seen nothing upon the subject in relation to domestic architecture for many years, and we presume it is because builders have learned how to construct chimneys so that they do not smoke. Perhaps the most efficient remedy has been to make the chimney flue no larger than is necessary. Certainly the tendency has been to make it smaller. The much-praised, old-fashioned fireplace of our forefathers, with its large chimney flue, was very liable to smoke. With a small fire the draft would be to one side of the flue, while cold air to supply combustion would pour down the other side, and if you had a good large fire it was necessary in a closely built house to leave open a door. The modern grate, with its small flue, say, of 8x8 inches, is a far better device for warming a room than the old-fashioned fireplace. Yes, a chimney may be too large for a dwelling house, and also too large for a downdraft kiln.

Written for The Clay-Worker.

SOUTHERN CALIFORNIA BRICKMAKING AND BRICKMAKERS.



OUR CORRESPONDENT is heartily of the opinion that there are some features pertaining to, and, in a measure, peculiar to, brickmaking in this region, which has been and long will be gathering a choice grade of population from all parts of our country, and we might say, from all countries, that will prove of interest not only to brickmakers, but to clayworkers generally. We need to confess, however, that our observations have been confined mainly to Los Angeles and vicinity.

It is hardly more than twenty years since the building both of residence and business structures of sun-dried or baked brick ceased, and many are the buildings of this character still in use and in a good state of preservation. These are found mainly in localities which have been passed by in the sweep of the new currents of Anglo-Saxon life (to a larger extent than is usual in our new cities the newcomer may be thus characterized), which is to-day flowing in upon it.

These adobe structures are naturally the homes and shops of the old Mexican element, with a sprinkling of Chinese here and there, forming a background of the old and effete before which to array the new in living and vivid contrast.

Naturally, in the development of a new country—and this the California of the South is, as truly as is Montana, if we reckon from the date of the grafting in of the civilization and progress of our day—a great majority of the new structures are of wood, where good material of this character is to be readily had, which is the case here.

The great redwood forests lying on the coast north of San Francisco and within the State line furnish a beautiful finishing lumber, and the pine forests of Oregon and Washington the finest framing timber to be found on the globe. The length of this framing material is only limited by the length of the cars on which it must be conveyed from tidewater. Joist and scantling, "clear as a quill," 32 feet in length, are to be had as cheaply as if one-half that length, and this material is of such quality and stiffness that 2x6 joists are commonly used to do the service for which 2x8's are selected in the Northwest.

Of such material houses could be quickly and cheaply built, and the mild climate seems, on the surface of things, to invite and encourage its use; and so the Los Angeles of 1880 of adobe memory, with its then population of 11,000, has come to be Los Angeles of to-day, with its population of over 100,000, housed largely within wood walls, and one may add that these residences possess as highly artistic features as houses built of the same material anywhere.

The genial climate the year through invites the construction of ample verandas, which in a twelfthmonth are usually richly draped with some one or more of the great variety of evergreen climbers which abound here. So that, while the paint is yet fresh a homelike aspect has been taken on, to a degree demanding seasons instead of months in less favored regions.

Many of your readers will be ready to vouch for these general statements, which are made with reference to making plain the building situation.

All who have visited Los Angeles or its sister city, Pasadena, will unite with me in the statement that they are well-built cities, and this statement will cover the business sections, which are mainly of brick construction.

—Brickmaking Plants.—

In a general way the brickmaking situation may be summed

Continuous Kiln, Capital Brick Works and Simons Dump Wagon.

up by stating that within Los Angeles City limits there are four works having as a part of their outfit continuous kilns of the Hoffman type, while at Centinela, some ten miles southwest of the city, is a large plant, most of the product of which no doubt is marketed in Los Angeles.

Besides these five works are to be noted those of the Simons Bros., both in Los Angeles and Pasadena, equipped with scove kilns, but which turn out as large, or a larger daily product at each place, as any of their several competitors, the details of which will be given later. There are two smaller yards in the city not taken into account, and the average daily product of those already named is about 200,000 brick per day, with an average run of ten months or more per annum.

Any intelligent brickmaker who should enter Los Angeles and make inquiries concerning the brick situation would at once decide, if three leading facts were given him, that there was at the present no money in the business, and in doing so would perhaps make a mistake.

—What Are These Three Facts?—

First. A very superior sand molded brick (and, so far as we have seen, only such are made) is sold at the yards at five dollars per thousand. These brick are in size 2½x4x8 inches, scant, and weigh 5 pounds.

Second. The fuel used is largely bituminous coal slack, costing an average of about $5 per ton, and when this is not employed oil is substituted, costing at the present time $1.25 to $1.35 per barrel.

Third. Labor is at least 25 per cent. higher than in the Northern Central region, as we will show later on. Yet, notwithstanding these stubborn facts, the brickmakers of Los

Truck for Carrying off Green Brick on Pallets. Capital Brick Works.

Angeles, so far as we have made their acquaintance, seem to be quite contented with the situation, and to be enjoying a reasonable degree of prosperity.

We heard no suggestion of any proposed trust or combine in order to "boost prices," but on the contrary one of the prominent makers gave me to understand that they were satisfied to maintain present prices; that it was their purpose as manufacturers to keep the prices at as low a level as possible in order to encourage the larger use of brick; that but recently the brickmakers had tendered to the city of Los Angeles, through proper official channels, brick for engine houses about to be constructed in sections of the city where the use of lumber was not prohibited, at prices to insure that buildings of brick should cost no more than wood construction.

We anticipate the questioning of your many readers as to how returns of profit under such conditions can be made satisfactory. We find in Chicago, Cleveland and in other larger cities prices prevailing for bricks, which in our judgment do not average in grade with the Los Angeles output for character, which net the makers $1 to $1.50 more per thousand, but in the latter case delivered, while in Los Angeles the prices are at the yard, with the addition of such cost for delivery as the particular case may demand, the price for delivery, however, not making more than half the difference asked, as we judge, but still the Los Angeles makers are handicapped with fuel costing 200 per cent. more than is current in the cities named, and with a 25 per cent. excess of labor bills, or about that.

Our answer to these inquiries may best be made by a careful setting forth of methods employed here, and we must leave our readers to come to their own conclusions. We do not think the brickmaker of this region need take a back seat in any gathering of the craft if called upon to compare either his methods of making or marketing his product. We have found much that has been of interest to us, and in the due order of our investigations we invite the readers of The Clay-Worker to make the rounds of the various yards with us.

—Visiting Los Angeles Brick Plants.—

We are fortunate in being under the guidance of Mr. Joseph Simons, the elder of the three brothers making up the Pacific Brick Co., whose works at Pasadena and Los Angeles have already been referred to. Were you to refer to the Simons brick plant in this region you would very likely be asked, "Which Simons?" for out of the seven brick concerns already named four of them are owned and run by gentlemen claiming this patronymic. These are all of one stock, those not brothers being cousins, and all hailing from the vicinity of Hamburg, Iowa. The father of our guide was himself until recently a brickmaker, and has just retired on his well-earned laurels, leaving a business which he established at Pasadena some dozen years ago in the hands of his stalwart sons, who, if we may judge, are eminently fit to take care of and enlarge it, as, indeed, they already have by inaugurating the past year the Los Angeles enterprise, the Pasadena being the parent works.

There is nothing small about "Joe," as his friends find it easy to call him, either in brain or in body (he must weigh near 300 avordupois), and our last view of him was in his clay pit at Pasadena, where we found him experimenting in lifting with a device of his contriving, a clay car off the track, and swinging it over to convenient reach of the shoveler, and then swinging it back to position on the track when filled—a feat he was successfully accomplishing. We shall have occasion to refer to other devices of our friend before we leave him, which stamp him as a successful and practical inventor.

But just now we are starting out on our round of observation. Joe has the large end of the seat of his roomy Concord buggy, and I occupy what is left, which proves sufficient. We first proceed to the works of the "Capital Steam Brick Works," the property of "Cousin Ed" Simons, which lie well within the northern limit of the city, located in what is known as Chavrez Ravine. The location is an admirable one, located as it is not far from the business center of the city, and with an easy down-hill haul to it.

At the point where the works are located hills, the one perhaps 150 and the other near 300 feet in height, the first composed from top to bottom of an excellent sandy shale clay, are divided by a level space just sufficiently broad to give ample yard accommodations for the works we have mentioned. The clay from both hills is utilized, one being more plastic than the other, is modified by the more sandy to meet the require-

A Glimpse of the Clay Bank of the Capital Steam Brick Co.

ments. This shale is so soft as to be readily taken from the bank with pick, and the haul to the factory is perhaps 200 feet in the one case, and but slightly more in the other, the hauling being done with dump carts.

—Power by Electric Motor.—

The machinery structure is small and the outfit simple. The clay is dumped directly from the cart into a crusher below the

ground level, and is carried by belt from the crusher to the machine after passing over an inclined screen. The crusher and sander are of the Potts make, and the machine is a Quaker. This machinery is run by an electric motor of 40 horse-power, which is encased with a dust-proof shell, and requires lubricating hardly once a day, and the care required seems to be mainly the turning on or off of the current as occasion requires.

Continuous Kiln, City Brick Co's West Side Works.

We find superintending this modern plant Mr. E. W. Simons, a son of the owner, who advises us that as against steam power, with oil at $1 per barrel, this electric outfit scores a saving to the owner of about $5 per day. This electric power is generated by water power in the San Gabriel canon, some twenty miles away, in the mountains, and the modest charge of the electric company is but 1¼ cent per horse power per hour. There are now two electric companies competing for the trade of the city, running car lines, supplying electric lighting plants and telephone lines, and supplying power to manufacturers, the second of which brings its current over about 60 miles of wire from the Santa Ana canon, in the San Bernardino mountains.

An electric motor is the perfection of a power outfit in a brickyard, as elsewhere. No stopping to clean boiler. No waste of time or fuel during the period usually required for getting up steam, or carrying during the noon hour, or lapping over the afternoon run, the current always on tap for use, or to be shut off the moment the requirement ceases, any stoppage from any cause and expense ceases, no waiting attendant on pay when services are not required. The cost of an outfit is less than half that of a steam outfit of equal power, and hardly any expense for the housing.

—Another New Device.—

While watching the brick machine our attention was taken with the method of carrying the green brick to the drying sheds. A spring truck fitted to hold 24 pallets (288 brick) received the pallets as they came from the press, and when it was loaded was drawn away by a horse, taking the same to the drying sheds and returning with an empty truck, to be loaded in turn. This was a new device to us, and we secured a snap shot of it, which is reproduced for the reader.

The Hoffman kiln, which seemed to us one of unusually fine construction, was built under the supervision of the proprietor, who was formerly a mason, by the regular hands employed on the yard. This kiln has 16 compartments and 28,500 brick are burned each day, the fuel employed is mainly coal slack, costing, as we have stated, about $5 per ton. Each compartment is fired but a single day. About one barrel of oil is also used in the burning of each compartment; we were not advised at what period of the burn, but presume at its close.

We took a photo of the kiln, before which may be seen standing a dumping wagon for brick, which is the invention also of Mr. Joseph Simons, our guide, who informed us that it was quite common to draw 2,000 brick at a load. We also are able to present a view of the south clay bank of this company. With no small trouble Superintendent Simons had a section of the iron roof of the room containing the electric motor removed that we might take a snap shot of it, with the genial superintendent standing near it. If our "shot" was a successful one it will also be presented.

—The City Brick Company.—

Turning our face towards the city, and not twenty yards away, brought us to the works of the company just named. The proprietors, Messrs. Goss & Hubbard, are also old residents of Iowa, and from the same section as the Simon Bros., being old friends and neighbors, but now prominent as men of capital and brains in this go-ahead city. Here Superintendent Chamberlain accorded us the usual courtesies.

We shall have little to say of these works, as they are built on practically the same lines as those just described, and the character of the clay and the output is as like as two peas. The power outfit (electric motor) and the kiln are almost identical, but we note the use of an Eagle dry pan in place of a Potts crusher, and a wooden Quaker brick machine. The machinery is run but five days in the week, turning out in an eight-hour day 36,500 molded brick, the five-day product being burned each seven days.

A view is given of their clay bank, which is not more than 150 feet from the pan, and will be long in about the same relative position, as it runs up near 100 feet in height. The bricks made are of a soft brownish red color, and at these works, as well as the others visited by us in the city, the color is very uniform. They are carefully sorted, however, and we judge, not over 5 per cent.—and we were told less in cases—are sorted out as being of a lighter shade, but no difference is made in the price. We were told that not over about 1 per cent. were of a character to require a discount, and from appearances do not consider this an overdrawn statement. The fact is brick are made in this section, to sell, and not to be relegated in whole or in part to the dump heap.

We present a view of the kiln of the City Brick Co. The reader will notice in the picture several derricks, and as may

Clay Bank of City Brick Co. West side.

be inferred these yards are located in the oil fields, within a range of 50 rods to the east of the point shown in our photo; we presume from 50 to 60 such derricks may be counted. Most of these wells are being pumped at the present time, the individual wells, which run from about 900 to 1,000 feet in depth, do not yield largely, but are known to be good paying property.

Before leaving these west side brickyards and crossing the Los Angeles river to take in the several east side yards, let us say that lying parallel with the river, and the main business streets, just to the west of the principal thoroughfare, is an elevated ridge, for a mile or more presenting to the view a very steep hillside, rising to the height in places of 150 feet or more. These hills are crowned with fine residences for the most part. Through one or two ravines, roadways have been cut, which permit of street car lines threading their way to the resident hilly section lying to the west. Chavrez Ravine, in which the brick plants described are located, is one of these gateways. The cuts which have been made through these passages, which nature has provided, in the interest of reducing the grade and of broadening the roadway, often show a face of 50 feet or more, and in almost every case (indeed, we know of no exception in a distance of more than a mile), running from the brick works in Chavrez Ravine to Third street, where the hill is being tunneled for a more direct passage from the business center of the city westward, where cuts have been made that do not show much the same character of shale as that which supplies the brick works mentioned. There is not enough of plasticity to make feasible the use of an auger machine. On the east side of the river the case is quite different, as will be shown in a subsequent paper. E. G. DURANT.

WRITTEN FOR THE CLAY-WORKER.

TERRA COTTA IN ARCHITECTURE.

The ethnologists have divided the periods of prehistoric man into ages, and called them the age of clay, of stone, of bronze and of iron. The present is often called the steel age, or the electric.

When McCauley's Fiji Islander arrives at Trinity Church to sketch the ruins of Wall street, we feel confident he will have substantial evidence for calling this the age of terra cotta. That there will be ample steel ruins left to justify him in his opinion of a steel age is doubtful, for what he will find will have been preserved only through imperishable terra cotta protection.

Would it not be interesting to know the comments passed in those future ages by the highly cultivated commentators of architecture and have their unbiased opinion of our efforts we now think so perfect. It's very possible that they will put us down as an age of copyists, lacking originality, and stealing all our lines from the ancient Greek, but will they consider we have improved upon the classics? We are educated now to believe that a good copy is better than a poor original. and so the learned profession of architects goes on, producing copies, placing the old mobilion cornice whose lines are stolen from some Greek temple, extorting the Corinthian cap and shaft to fit some fifteen or twenty-story building undreamt of by the Greek. This age can excuse itself on the plea of the demands of the times, and boast of their heights and accommodation obtained unthought of in past ages. The lack of individuality in creating new lines must be forgiven for the extraordinary combinations produced with the old, but since the architects of this century have abandoned all possible hope of the conception of a new order, and are working out on the lines of copyist, they seem to strain every effort to make one material copy another. Late years there has been an effort to make materials appear more what they really are, and the old pine door and inside woodwork of the same material is not thought proper form any more, to make it appear as oak by graining. Wooden columns and galvanized iron cornices, with a coat of paint and sand, to appear as stone, is no longer specified by the legitimate architect.

Still up to the present moment he is endeavoring to make all terra cotta appear as any other substance or stone, but what it really is, the product of clay.

There are buildings on Broadway of terra cotta masquerading as granite, and the architects, we presume, flatter themselves on the success of such an achievement, of having imposed upon the public.

Now, presuming it was granite, in what respect would it be better? Only one possible known reason: it would have cost more. The prejudice that exists against terra cotta from a professional architect's standpoint, fortunately, is only found lurking in the back byways of the profession, and emanates from some small man who has as yet never been intrusted with the erection of any buildings of magnitude, or he would find his appreciation run out before getting half the height of his professional brother who judiciously applies terra cotta. His ground and lower floors would be consumed to a great extent with foundations to carry the weight of his superstructures; it would not pose as fire-proof, and decoration to any extent would be debarred him by its expense.

It's to be wondered at that architects who have so generously patronized terra cotta stick with such tenacity to its imitation in texture and color to stone. The same architect who would not permit a piece of wood carving to be sandpapered will request that the delicious treatment of the modeler in clay will refine his finish, taking all life, energy, fire and beauty from what was the perfection of the material.

Again, in architectural moldings in terra cotta, if intrusted to an artistic modeler in clay to produce, he would exactly follow the profile, but it would never enter his mind to chisel chase it, to bush hammer it to curl its surface, to comb it, to stipple, to sponge it, or stripe it, and unless it was for a Comstock he would never undertake to put every little molding into corduroy breeches, the detestable prevailing finish of the moment, but he—the modeler—would give you a live molding, with shadow and texture without sandpaper, and preserve the profile true.

The best efforts of the new steel skeleton and terra cotta building is the outcome of the conference between the architect, the engineer and the practical terra cotta manufacturer. This strong combine of talent should have power to add to their numbers; they should now take into their confidence the artist on color, and with a judicious rendering of harmony, produce something that would be a joy forever. The manufacturers now hold themselves prepared to produce all colors, with or without a glaze, a semi-glaze, to enamel. So far, efforts in color, either architectural or emanating from manufacturers, samples of which have been seen of bright green, patrows in full bloom, sprouting from brilliant blue foliage of the Arkansas, on a subdued background of bright yellow, that would make a rainbow blush. We have seen delicately modeled basrelief work in panels receive a dose of enamel that made them look like poor ornaments on a cheap wedding cake. The judicious placing of the glazes, enamels and semi-glazes will fare better for the future if left in the hands of the artist who is not blind to feeling or to color.

Our Fiji Islander will have much in New York to study, providing it's finished, when he arrives. Max O'Reil, or one of his countrymen, said: "It would be a nice place when finished." He is sure to be lured to Boston, from what will be left in old musty literature to coax him to the classic spot. If he is seeking ruins I fear there will be not much left. The majority of the best buildings were built of Connecticut brownstone, and disintegration has very decidedly set in already.

The terra cotta works of once prosperous Boston are long since faded and gone; they were of the past previous to A. D. 1900. Boston's library was fine; it's a case of a survival of the fittest, so if all melts away by that destroyed time, and only the terra cotta remains, it will have lost its power of gravity, and the arched domes of the reading rooms will remain suspended in space as monuments of that material's indestructibility.

There will be no guide to tell him the appropriation was exhausted in Mosaic for the entrance halls, so the balance was filled up with mud, varnished and called terra cotta.

If he crosses to the once windy city he will be repaid in studying the facades that show originality of thought and treatment. They call it now Sullivanesque. M. JAY.

Written for The Clay-Worker.

BUTTON-HOLE TALKS.

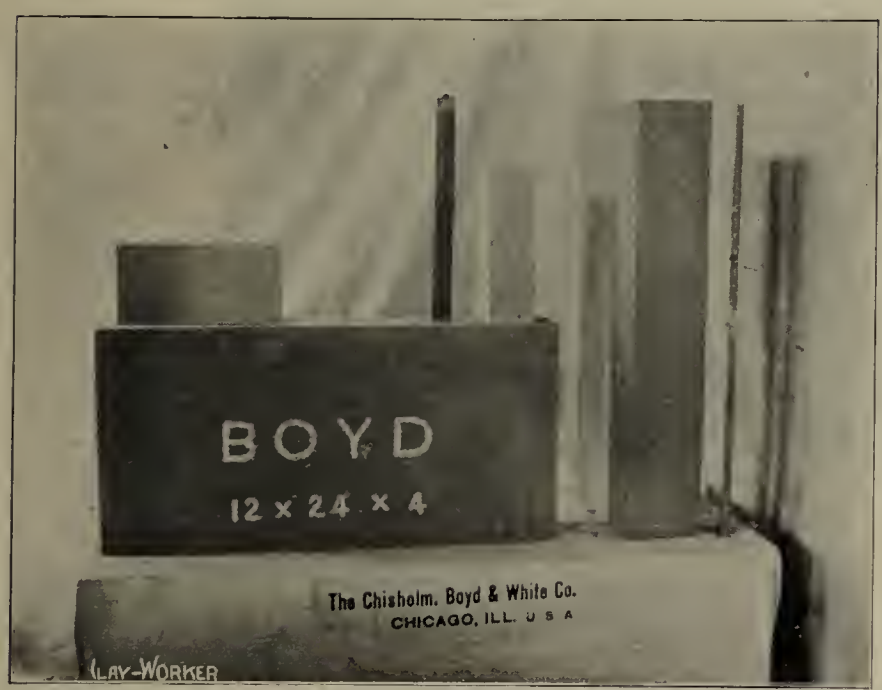
IT WAS DURING the National Encampment, and we were discussing the sights on the streets, crowded, as they were, with visitors from all quarters of the country. Each incoming train had arrived heavily freighted and had poured out its quota of old, bent men, who took possession of the sidewalks and streets and walked, talked, visited and did generally as they pleased, for they were the guests of the city and the day was theirs.

All gradations of uniforms, of Grand Army hats and of badges appeared all the time and everywhere, while every one was glad to see and reverence the old flag and the old heroes.

We were talking of these old heroes and of their pathetic parade that year by year shows less in number, more gray hair and bent backs and a more hobbling gait; where every year at decoration day the number sleeping under the flowers grows greater and the number strewing them less. Talking thus, my old boyhood chum broke in on me thus:

"Look here, old man, just came up Monroe street and had a terrible time getting through the crowds. Awful jam; all sorts of veterans, afoot, horseback and in carriages. Delegations going this way and then delegations going that way. Posts in uniform with gorgeous banners and blaring bands, and then more posts, with more gorgeous banners and noisier bands.

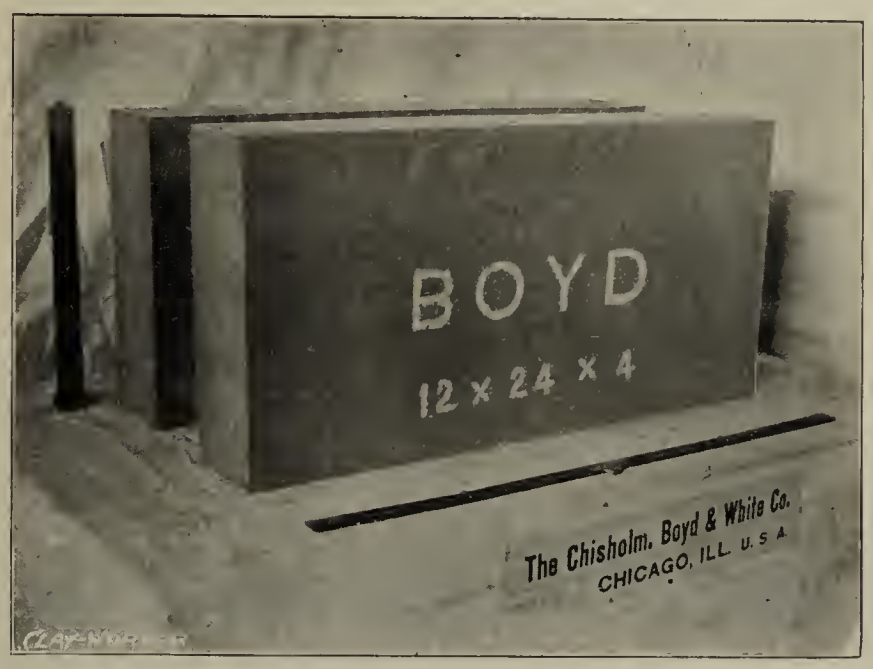
"After I got past the Palmer House on the sidewalk, just past the thick of the crowd, I ran into a little band of men that looked so lost and lone that they attracted my attention by their very forlornness. There was a tired-looking man listlessly punishing a bass drum and a weary comrade paying fleeting attention to its snare companion, as they crowded through and among the people on the walk and moved toward the big crowd. Back of this band came half a dozen old men,



shuffling weary feet under stiffened joints and with shoulders bent under the weight of their burden of years, while their grizzled hair and whiskers also told of the frosts of many winters. They were jostled and laughed at as old fossils and country Jakes by the thoughtless young men and women who were yet unborn way back in the sixties, when these men were offering up the priceless sacrifice of their youth and strength to their country's need. No one would fear them now. Their looks bore no indication of deeds of heroism, but spoke rather of the dull routine of farmer's life. How it happened I hardly know, among such a wilderness of badges, but someway I just happened to catch the lettering on a by-no-means gaudy badge fluttering on the breast of one of these old men and saw '36th!'

"Then I stopped still in my tracks and the whole scene changed. I looked at those few mild faces and I knew I was in the presence of heroes. I knew that these were the faces that had looked often at death and had not flinched. Those mild eyes were eyes that had glanced along the sights of their muskets and looked straight into the enemy's guns. Those stiffened legs, then strong and sturdy, carried them on many a charge, and those great, awkward feet were indeed then the swift feet of undoubted heroes. They were heroes, indeed, so great heroes that when there was no enemy to conquer they went quietly home and became as good farmers as they had been soldiers.

"Did I speak of them as a half dozen? Why, as I stood there they grew in numbers. Quickly, one following another, a multitude followed the original half dozen—unseen by the crowd about, but plain to me—they were the familiar faces that you



and I saw go to the war when we were little boys and the country was in danger. They were the phantoms from the cemeteries, the dead and forgotten heroes. One after another they filed along, passing me as they passed you and me long years ago as we stood, two country urchins, with red braid pinned to our trousers and rooster feathers in our hats, full of patriotism and green apples, watching them march off to weary privation, hardship, suffering and death.

"Now come with me and we will stand on a street corner and yell ourselves hoarse for these old heroes and for those old recollections." GATES.

GIANT DRY PRESS BRICK.

A Remarkable Product.

THERE SEEMS to be greater possibilities in the dry press process of brick manufacture than its most ardent advocates have supposed, if we may judge by the specimen brick on exhibition at the office of Messrs. Chisholm, Boyd & White, of Chicago. We show illustrations of these brick, which measure 24x12x4 inches. There were made on an ordinary Boyd press, the only change being in the dies. The brick were made for a special purpose and came from the kiln so nearly perfect in every particular that the manufacturers are convinced that it is perfectly feasible to make dry press brick of this size or any size between this and the ordinary building brick that may be desired.

The large brick are handled much the same as the ordinary dry press brick, except that they are carried separately on board pallets from machine to dryer or kiln. While such giant brick may not come into general use, architects and builders will not be slow to adopt them for special purposes when they find they can get them. So another clay product is launched into the building world.

Written for The Clay-Worker.

A CLAYWORKER'S OBSERVATIONS IN HAVANA.

A Quaint City Affording Trade Opportunities for American Manufacturers.

HAVE YOU EVER been in Havana? If not, the casual observations of the writer while spending a fortnight in this city, which is both ancient and modern, may be of some little interest to you.

On entering the city your first impression is that there are no streets, only alleyways, but presently you will come to know there are no alleyways, and only streets. The streets are very narrow and proportionately near together. They are so narrow in many parts of the city that it requires careful driving for two carriages to pass. The greater portion of street paving is of stone, and is a rough, hard and slippery pavement.

There is a little paving of asphalt and asphalt blocks near the Governor General's palace, but we have seen no brick pavements in the city.

The heavy hauling and draying is done almost entirely on large heavy carts, drawn by mules singly or in tandem.

We have seen five mules in tandem doing service without a line. Heavier carts are used in the country, where oxen as well as mules are used. These carts frequently carry more than four tons. The accompanying photo illustrates a scene in front of a country store.

There are but two or three street car lines in the city, and these are the old primitive horse cars. In lieu of a better street car service there are about three thousand hacks or carriages which are used by the people as a means of transportation from one part of the city to another.

The sidewalks are also narrow in proportion to the streets. Indian style of single file is the way pedestrians have to move over these walks.

The buildings are low, being one and two stories generally, though there are a few three-story buildings. They are built of stone, which is very soft and easily cut into any desired shape for ornamentation. The walls are exceedingly heavy and massive, presenting the appearance of great strength. The ceilings are high, some being twenty feet or more, which affords as cool and airy rooms as possible.

While the city is built mostly of stone, it is covered with a clay product. All the roofs we have seen are of flat square tiles, the old Spanish tile or the more approved French tile. Spanish tiles are used on nearly all old buildings, while on the new and more modern ones the French tile is used. Its general appearance is more pleasing, and it is also lighter in weight than the old Spanish tile, which is a decided advantage in its favor.

All new buildings are roofed with French tiles, which are imported from Spain at great expense. These tiles are ⅝x9x16 inches, and cost delivered here about $60 per thousand.

The American clayworkers and American builders would do well to give this subject of roofing tiles more consideration. The clayworker could extend his field of trade, and the builder would leave to posterity a permanent monument to his wisdom.

There is a good field for expansion in trade here along this line by the clayworkers of the United States, provided they made the style and quality of roofing tile which is in demand.

Tile roofs are to be found on the houses far into the country, and the wonder is how they ever found their way to these remote and out-of-the-way places so far from railroads or other means of transportation except the carts.

We have seen country homes covered with fine French tiles, and the tiles on these were the greater cost of the entire building.

Central Park on the Prado, Havana.

All the floors in the city are of unglazed tile and marble. These floor tiles are made in many colors and of most beautiful patterns. Both black and white Italian marble is largely used for floors and also for stairways. No carpets are used on these floors, and only a few rugs.

Glazed tiles of the most artistic designs are extensively used for wainscoting.

The buildings are all stuccoed outside and plastered inside. They are also painted and frescoed, and the predominating colors both for outside and inside work are blue, yellow and pink.

A peculiar feature in all buildings is they are without chimneys, but as no fire is ever required for heating purposes, this feature is readily accounted for. All cooking is done on charcoal stoves made of brick and tile.

Havana has a population of two hundred and fifty thousand, and as a protection against fires it has only two small but well

equipped fire stations. These are not called out more than once in six months.

The city was founded in 1514, and is therefore 386 years old. It has a fine harbor bay on the east and the Gulf of Mexico on the north. Viewed from Morro Castle or Fort Cabanas it presents a beautiful picture, with its low uniform buildings, all blue, pink and yellow, and surrounded by the green hills, which rise very perceptibly in all directions from the city.

Here is a city which has been building for centuries, and no one can come here and not be greatly impressed with the massiveness and solidity of construction and the substantial manner in which all building has been done.

Here is a city built from the mineral resources of the earth. It was not built by the present generation or for the present generation alone, but for many generations to come. It was not built from a gigantic growth of vegetation, as too many of our American cities are, which go to rot and decay in one or two decades. If we could combine our art and knowledge in architecture and our perfected sanitary systems with this permanence of construction we would then be able to build ideal cities.

ITHAMAR.

WRITTEN FOR THE CLAY-WORKER.

CLAY PRODUCTS IN THE NATIONAL MUSEUM.

—Tile and Terra Cotta.—

TILE AND TERRA COTTA exhibits in the National Museum, at Washington, include many rare and valuable specimens and occupy prominent positions in that institution. Those contained in the exhibit at the Centennial, at Philadelphia, became memorable not only for their grandeur of design, but for their artistic execution. As ceramics they are the acme of skill and magnificence. At the west end of the dome entrance two colossal Limoges faience vases are shown, the product of Haviland & Co., of Limoges, France, and donated by them to the United States Government at the close of the Centennial in 1876.

Each of these ceramic vases measures 7 feet 4 inches from base to dome, and the greatest circumference of the inverted cone-shaped bodies is 11 feet 4 inches. The figures upon the domes are 3 feet 4 inches in height. Each vase is valued at $8,750. Slight indented impression marks the division between the lower end cones and the upper cones. The covers are in the shape of a dark blue hemisphere, studded with white stars, typical of the then number of States. An artistically executed bust of a figure of liberty, with a pearl-like diadem set upon flowing tresses and faced three-quarters to the right, rests upon a small base in front of the dome. On either side there are winged seraphs, the right one holding with outstretched hand and arm the laurel wreath, the left one, of like angelic form, is in the attitude of blowing the Davidic trumpet, declaring peace. Both are heroic conceptions and hold sheaves of grain in their left arms. The greatest face of the urn is embellished with the American coat of arms, the background consisting of American flags, the whole being vitrified. Over this design the names of the Presidents, from Washington to Grant, are painted in gold letters. The base rises gracefully for twenty inches to the lower end of the cone, ending at the interstice with life-size sheaves of wheat and grain stalks. The entire base is covered with grains, fruits and agricultural implements in all their natural colors. The rest of the surfaces are decorated with deep green designs of leaves and palmetto stalks. The second, or right side entrance figure of the vase, which is of the same size, height and design, differs only in detail. It has a full face bust of George Washington, under which the names of the signers of the Declaration of Independence are painted in gold letters. The base is a representation of a marine view with rolling waves dashing toward the lower end of the cone. Some eight pieces of heavy ordnance form the intersection between the cone and the base. Both pieces rest upon circular wooden pedestals and are viewed by the visitors with much admiration and reverence, next to that excited by the colossal figure of liberty, the clay model of the figure that surmounts the dome of the Capitol, which stands in the center and under the dome of the National Museum, and stands twenty-four feet in height.

The next important terra cotta exhibit is by Messrs. Doulton & Co., of London, consisting of a pulpit covering twelve feet of space, standing ten feet high and five feet wide. It has eleven treads leading to the chancel door, which is three feet high. The chancel is of a semi-Gothic design, octagon in shape, with swelled corners resting upon round columns, with projecting base and caps. The sides and panels contain niches, in which white ceramic statuettes, consisting of three figures, each eighteen inches high, representing the Savior in various attitudes or in communion with his disciples. The balusters of the steps and top of the chancel are supported by arches and graded columns with colored embellishments and embossed figures. The front posts of the stairway are square and are inlaid with many fancy designs. This magnificent work was designed by Mr. George Tinworth. Messrs. Doulton & Co. made the presentation to the National Museum in 1876.

The baptismal font in the same collection is likewise of terra cotta, formed in the same general polysided design. Its basin is a vitrified gray clay, with a half-inch pipe orifice for the water supply in the center. It stands about five feet high by four feet in diameter, and rests upon columns with projecting circular bases and caps. It is ornamented with colored and embossed designs. The panels upon the upper end are friezes, with colored designs of figures and scenes taken from the life of Christ. The figures are clothed in Oriental costumes and stand out in bold relief. This piece was also designed by George Tinworth, and is deemed one of the grandest ceramic works of this century. It was presented to the United States by the same firm in 1876.

A Spanish Tile Roofed Country Store and Cuban Horseless Truck.

The same firm has loaned to the National Museum George Tinworth's ceramic reproductions of various scenes in the life of Christ, such as the raffling for his robe and his resurrection, in each of which some thirty figures are shown. These form two panels or friezes, and are parallelograms two and one-half by five feet in dimensions. Each is provided with a fluted frame on which English quotations from the New Testament are given, indicative of the particular scenes represented. The figures stand out in bold relief and are most lifelike in appearance. The draperies are artistically modeled and are of an ochre color.

The great Lambeth vase was presented by the makers to the National Museum in 1876. It stands upon a circular wooden pedestal, and is five feet high, with a greatest circumference of

(Copyrighted, by Edward A. Oldham. All Rights Reserved.)

ten feet. It is a perfect inverted cone with a flaring or trumpet-like orifice, the neck being one foot in height. It has a graceful Hogarth line base two feet in diameter joined to the lower end of the cone with a deep blue coil one and one-quarter inches thick at the intersection. It is a clay model of remarkable design, and the surface is embellished with interwined leaves and branches upon an orange-colored ground with designs of flowers and leaves in deeper colors.

The Italian terra cotta font represents a nautilus shell standing three feet high and two and one-half feet in diameter and oblong in shape. In the cavity a terrapin is seen upon which are three male children playing. One is seen climbing over the edge of the shell. As a work of art it is highly prized. It is of a deep maroon color and was presented in 1876.

Iridescent tiles, the making of which is termed "the lost art of Persia," but which are closely imitated by Mr. Edward Lycett, of Atlanta, Georgia, are among the notable ceramic gifts to the museum. The American Minister to Persia, Hon. S. G. W. Benjamin, has stated that these iridescent tile-makers were massacred by the hordes of Mohammed of Afghan, and with them perished this ancient industrial art before the dawn of the Christian era. Only a very few specimens have thus far been exhumed from Khorsabad and other sections of Mesopotamia. Mr. Lycett has reproduced some of these ceramics in exact imitation of the forms and highly iridescent colors, as follows:

Panel in three colored divisions in a two-inch wood frame. The upper design comprises three palm leaves with stems in a fawn color shaded with light blue. The middle division, eight inches square, is an iridescent design with scrolls. The lower division contains three indented discs, held together by bands and buttons, in the center intertwined with leaves.

Two panels, held in a half-inch whitewood frame, also have three divisions, each four inches square. The upper and lower ones are dark and iridescent and are embellished with stars and rosettes. The middle division is of a light opal texture.

An American vase of clay is most artistically striated with dark brown streaks from the orifice to the base. It has a three-inch neck with an orifice one and one-half inches in diameter, encircled with an embossed silver band one and three-quarters inches deep. In form it is nearly circular and ball shaped, and eight inches in its greatest diameter, and has a small, flat base two and one-half inches in diameter.

Three iridescent paper weights are imitations of Murrhine, decorated in Persian fashion, by the same maker. One is one and three-quarters inches square and three-eighths of an inch thick, and is striated with yellow and maroon streaks running perpendicular. Another is four inches long and has a box in which the figure of a dolphin in natural colors with all its peculiarities appears. It is encased in a quarter-inch rim of a brownish color and is very neat and attractive. These articles are termed sky blue decanter, "reflit metallique."

A brilliant sky blue decanter, with gold handles of graceful shape, has a flat body, the whole being striated with darker tints. It stands eight inches in height and the greatest width of the flat side is six inches. It has a graceful neck with an artistic flaring lip. A gold rim and gold designs are shown upon the sides, and the whole rests upon a small gold rimmed base.

The National Museum has been for some time past and is now being supplied by the Akron (Ohio) Tile Company with tiles of many sizes, thicknesses and colors for affixing their mineral specimens by a process of cementation. These tiles are not glazed, but present rather a porous surface. A great variety of these tiles of square and oblong shape are thus shown with mineral specimens exhibited thereon.

There are two tile panels of different colors in the foreign tiles that were presented to the National Museum by Messrs. Minton and Hollis, of London, in 1876. Each is five feet three inches square with simple embellishments and embossings. They attracted much attention at Philadelphia.

Written for The Clay-Worker.

A CONTENTED BRICKMAKER.

A BRICKMAKER, WHO, for more than a quarter of a century has been actively engaged in brickmaking, was a guest at a recent meeting, where many other manufacturers had also congregated. Short talks on brickmaking in all its branches was soon in order. Our friend, being prevailed upon to address the assemblage, during his discourse, had occasion to utter the remark: "I am a contented brickmaker." Now, this gentleman is located in a prosperous town in southern Michigan, and his plant has a widespread reputation for neatness, even and smooth running and great production of splendid hard-burned, uniform brick. The writer concluded to visit this man and learn if possible by what method he managed his affairs that resulted in contentment. Following is the result of the interview:

"Mr. Darrell, in your speech at Greenfield, you stated that you were a contented brickmaker. Permit me to ask what course, as a manufacturer, did you pursue, that has rewarded you with contentment?"

"Well," said he, "when I determined to enter the brickmaking business, I made several resolutions and have always lived up to them, which, I think, framed my career successfully. First, to have a good plant, with a bed of good, rich clay, running to a depth of not less than eight feet. Second, to have the engine, boilers, machines and all other appliances used in the manufacture of brick to be modern, strong, compact and durable. Third, to employ none but reliable, careful men. Fourth, to have the whole governed by good management."

—Equipment.—

"The engine and boilers were of the most approved type, somewhat more expensive than the earlier style. I persuaded myself to believe that the cost for repairs and the irritating annoyance caused by breakdowns would exceed the cost of the newer article. This engine and boiler has been in continual service for more than twenty years, and, in all that time, I have not paid out, all told, $10 for repairs, for this reason, they were never allowed to get in such condition. Every week regularly the boilers are thoroughly washed out and inspected. Every day all the bolts, nuts, pins, etc., of the engine are examined, that they have their proper taughtness. You never hear the pounding of the piston, the cluck of loose bolts at every exhaust, or the rattling of crank pins, or the hissing of escaping steam. These are the causes that lead directly to breakdowns, and the manufacturer's bugbear, 'repairs.' It is better by far to have your engine properly keyed no matter whether its momentum be great or slow, its action will be so even, accurate and true, that were you to close your eyes, you would not know it to be in motion, for you would not hear a single sound. Such attention, and it is well given, you will never have occasion to resort to repairs.

"The machines are of the soft mud quality. There are many machines on the market that possess marked merit. It would be difficult to name the best. Mine, as you see, are all iron, with double grinding shafts, powerful clod-cutters and press. In every way they are strong, compact and durable. They, too, are treated with as much consideration and attention as is the engine. They, too, must be cleaned weekly. Occasionally there is a breakdown, occasioned by some foreign substance, such as a stone finding its way from the clay bank to the tub; otherwise, a breakdown never would occur. The trucks, carts, barrows, molds, wagons, etc., are likewise well-made, strong and serviceable.

—Labor.—

"The employes to a man are sober, trustworthy and reliable. None other would for a moment be considered. They all are given to understand that all the rules of the plant must be strictly adhered to. Good wages are paid, and in return, good results of their labors are looked for. A careful, painstaking man is never dismissed that his position may be filled by a youth of tender experience at a reduction in wages. Why, the damages certainly to be suffered at the hands of the inexperienced boy would more than doubly pay for the services of a careful man.

—Filling Pits.—

"It is an established fact that half the brick that are cracked either in drying or burning is caused by a small, hard lump of clay. Remove the cause and you avoid the effect. In filling pits, only nice, rich yellow clay should get in. Not even a single shovelful of top dirt or crust should be allowed. After the

pit is filled the clay must be thoroughly tempered and water soaked, and to so remain for twenty-four hours, when it is in condition to be molded into brick. In that time all those little hard lumps are surely dissolved.

—Making Brick.—

"The machines turn at a given speed, never faster than to turn out eleven molds per minute, and every brick that comes from that machine must have every corner full and square, every edge sharp and even. If it is otherwise, it cannot be counted in with the day's output, but must be returned to the pit and molded over again. Nothing but the standard brick, uniform in shape and size, can go on the yard to dry. One undeveloped brick will mar the attractiveness of one thousand good ones. In handling the brick, from the offstriker to the trucker, by him to the dumper, each and every pair of hands through which they passed, must handle them with the greatest care, for he who would jar them to unevenness, holds his position of small moment. It is a strict rule and strictly obeyed. In all the yards of green brick, drying there in the sun, is not a cracked or broken brick. Not a single "bullhead" or "flatnose" can be found among them. Every row as straight as an arrow, and their space apart as true as though dumped by actual measurement. With such painstaking the loss in green brick is trivial or nothing.

—Hacking.—

"It is difficult, indeed, to hack a yard of dry, green brick without some loss or damage. Yet this has been overcome to a great extent, so much so, that if in a yard of sixteen thousand hacked brick we should see five damaged or broken brick it would be a surprise. It was brought about in this manner. It is customary at most plants to permit their hackers to pick up as many brick as they could carry. They are even urged to haste, and in their endeavors to witness who is the strongest man often overtax their strength, and then the sure spill, with a shower of corners and pieces flying in all directions. Here it is different. No one is allowed to take more than four brick per hand, not faster that 750 brick per hour per person. By enforcing this rule we are assured that the brick retain their corners and edges, that they are not cracked or split.

—Wheeling.—

"The desire to 'wheel' their allotted number of brick in the shortest possible time is not thought of by the wheelers at this plant. They, like the hackers, dare take only four brick per handful, and if he is setting the middle or top bench, they are allowed to toss him but two per handful. By adopting this method we are happy in the knowledge that we save all the corners on all the brick.

—Setting.—

"All our kilns are built three over three, the arches are twelve courses high; nine straight courses, two jets the third jet to twelfth course is the locking jet. This jet, in fact the whole arch, is then secured by the binding course. Above this it is all three over three, set equal and even with equal space between each and every brick, which furnishes a splendid draught. The kilns are built forty-five courses high, with double platting and scoving. The kilns generally contain fifteen arches, as it requires no more labor to burn fifteen arches than it does seven.

—Burning.—

"Five days and six nights are required to thoroughly burn a kiln. A slow fire for the first two days, or until the water smoke rises, when the fire is increased. As fast as the water smoke rises, so, in proportion, is the heat increased. Always keep the fire under complete control, never let it get beyond the water smoke, for, in all such cases, the result is 'soft spots,' 'salmon' colored and 'whitewashed' brick, a very undesirable article to have. The fuel used is soft cordwood, viz., white ash, soft maple and basswood. About seven cords per arch of 28,000 bricks each is consumed. Wood is preferable as fuel, for with its use it is possible to color your brick as desired, from oxblood red to the Harlan blueish gray.

"Yes, I am a contented brickmaker, and why should I not be? With a plant and all the instruments used in brickmaking always in A1 condition, and as such they are retained. The brick that are produced are simply perfection, eagerly bought and paid for at rates entirely satisfactory. I suffer no loss either in green or burned brick. Every brick made finds its way to the market as sound and as uniform as when molded. The bat pile is conspicuous by its absence. My employes have been with me many years. They have never struck, but are a contented lot. Annoyance from breakdowns has never been experienced. The sign 'Closed for repairs' has yet to appear for the first time, and at the season's close, when accounts are balanced, the loss and gain account looms up in pleasing figures on the proper side of the ledger. Yes, indeed, I am a contented brickmaker." J. G. GREUSEL.

AN INTERESTING FIRE BRICK PLANT.

MY RAMBLES this month in search of brick lore have carried me to all portions of the city north, east, south and west. While some of the brickmakers report a falling off in trade, others say their business is good, so as a whole things average up pretty well. In the northern section (Tioga) I met an old acquaintance of The Clay-Worker, Mr. George W. Sharer, who is convalescing after a long and severe illness. Since January last he has been a very sick man. An attack of la grippe brought on heart troubles that have kept him at home most of the time and prevented him from going after business as he would otherwise have done. He thinks he is in a fair way to complete recovery, and hopes that before the frost has shaken all of the chestnuts out of their burrs to be about again, active and hearty as of old.

Down in the southeast section of the city I found the well-ordered fire-brick plant of George and William Kolb. It faces that grand old highway to the broad Atlantic, the Delaware

Fire Brick Factory of G. and W. Kolb, Philadelphia.

river, flanked by the tracks and sidings of the Baltimore & Ohio and the Philadelphia & Reading railroads. These afford splendid shipping facilities. William Kolb, a sturdy worker, with a good warm hand clasp, greeted me with a happy reference to the importance of keeping in touch with The Clay-Worker, and invited me to look through the plant.

The main building is 132x100 feet, two stories and a basement. The power is furnished by a 25-horse-power engine and two 40-horse-power boilers. The clay is ground in pans in the ordinary way and tempered in an immense pug mill of their own make. The common brick are molded in a Penfield

soft mud machine, and the odd shapes are made by hand.

Speaking casually of fire brick, one naturally thinks of the ordinary cube of clay, but a glance through their drying racks show many queer shape brick and block. This firm turns out in all nearly 800 different shapes. These comprise stove linings, cupola bricks, bakers' tiles, square bricks and locomotive tiles; from the dainty midgets that line the small stoves used by those who do light housekeeping to the immense blocks or plates that line the interior of the hotel range and measure, some of them 12x60 inches; they make every conceivable style and size of stove lining. So when ye merry brickmakers are enjoying a gastronomical feast at the next convention, give a thought to the cook standing before a 12-foot oven, and then let your thoughts slide toward the boys who with their good fire clay line the oven's interior, thus themselves becoming moral agents of conveyance, by which your own little "ovens" are being lined. It may strengthen your pancreatic secretion.

From the pattern shop we pass into the sectional rack de-

G. and W. Kolb's Fire Clay Saggers.

partments to the mixing room, and the kilns. Here I met George, brother of William, and a good partner, I'll swear. He is interested in the application of gas in place of coal, believing it would prove an economic factor, as applied to their kilns and as a dryer.

At present they are drying by the indoor rack system. This entails the usual four or five days and a week in burning. Applying the drying system, and the drying and burning would be gotten through in one week.

Starting fifteen years ago in a small way, the Kolbs have, by steady persistence built up a good plant and a nice trade, and now feel ambitious enough to want the best means applied as a labor and a profit saving factor.

The noonday whistle is shrill and their appetites are sharp, so I tarry not, but promise to call again.

A gray day, truly! with a little drizzling rain, or I would have taken a snap shot of Charlie Young's wagon unloading their hards for the pavements at Sixth and Jackson.

—Elmwood Brick Co.—

Such is the inscription on the card I find on my return. Where is Elmwood? This is a new one on me, and I place that in the hat for future investigation.

Starting out the Union Traction Company and I made no less than four efforts to reach there. On the first, the conductor being an honest man, gave me this as a pointer: "Say, we are supposed to go within a mile or two of it, but I'll tell you, on the straight, Griffin, while I can pass you out, you'd still be about twelve miles, or squares, to go. It's all over low swampy ground that some of these old gunners won't tackle."

After taking his advice, and three other cars, I was landed, two hours after, in a delightfully bucolic environment, where the only keynote to human intelligence was a six-foot signboard, bearing the legend I was gunning for. Here I left civilization behind, and plunged into what might be termed with a long stretch of imagination as a lane.

It did not require the services of a Western scout to inform my carefully trained glass eye that the lane and traffic had been strangers for some time.

Sch-wack, sch-wack, that the stagnant waters from the late heavy rains threatening to annihilate my $2.50 russets.

By flanking the enemy, I contrived at last to reach the yards, my collar still preserving its integrity for uprightness and cleanliness. I began to think that I too was flanked by cirsumstances and that the yard was shut down, but as a cheery voice hailed me from a corner of the soft mud machine, and being keenly on the alert, I snapped him and it.

The plant is owned by Messrs. J. W. Camac and J. J. Conner, with offices at Sixty-second and Woodlawn avenue. They had, he informed me, been shut down for a week or so, but were going to start in right away.

Looking over the ground, I found five or six acres, covered with the four 10-arch kilns, a good clay pit and facilities for hand gauges. Ten 50-feet racks, and a steam tunnel dryer, with a super-heater, thus extracting the steam from the boilers and driving by extra force into the dryers.

An Erie side-arm engine of 60-horse-power and two Erie boilers made up the motive force for the yard, which turns out

G. and W. Kolb's Moulders.

some 30,000 daily during the season, 27,000 of which can be tracked right off into the dryer.

Their output for last year was about five million in stretcher, hard and salmon. LOCKINGTON.

FIRST IN THE FIELD.

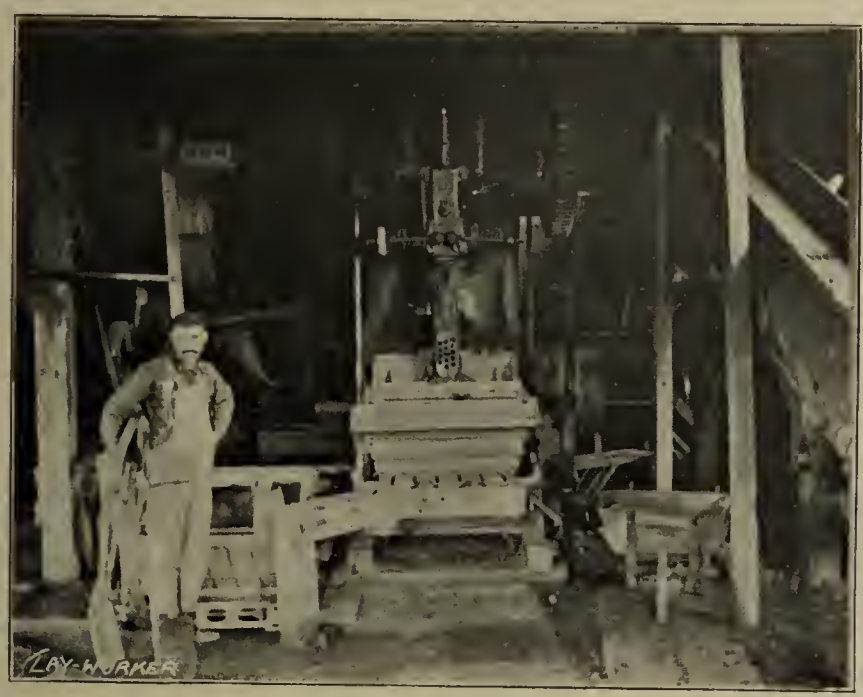
Semi-occasionally the advertising journals dig back into the past and discover the "first user of advertising," absolutely the originator of the thing (some old Greek or Roman, generally). It seems never to have occurred to the diggers that nature was first in this matter, as in most others. The flowers have been advertising from time incalculable. When a clover or a rose or a corn plant has completed its growth to a point where it has pollen to send to others of its species and stands in need of pollen from them, it throws out the most "catchy, attractive and effective" ad. possible—its flower. The color, shape, scent and honey are merely an advertisement for help from that powerful little friend of all flowers, the honey bee. When the interchange of pollen is complete and the plant has obtained the required stimulus for its further growth, the ad. is withdrawn. The scent evaporates, the pretty tinted petals sear up and become unattractive seed capsules and no further efforts are made to carry on commerce with others. The ad. is "killed"—withdrawn from circulation—for it has accomplished its purpose and is no longer needed, at least not until the "busy season" the following year.—Ad. Sense.

WRITTEN FOR THE CLAY-WORKER.

CLAYWORKING IN DENMARK.

ALTHOUGH IN AREA one of the smallest countries of Europe, ranking, indeed, last in point of population, few continental countries give evidence of a better record of prosperity than the little Kingdom of Denmark. Under a wise and almost democratic government the natural and keenness, coupled with the essential quality "honesty," the people have combined gradually to raise the quaint "land of Fiords" to a state of development that is creditable to an extreme, considering the limited resources at hand.

For example, there are no mines, and few forests throughout the whole of the Peninsula of Jutland and its several adjacent islands. The surface of the country is very low and flat, some portions of the northern coast being below the level of the



The Soft Mud Machine, Elmwood Brick Co.

sea, from which they are defended by strongly-built dikes. The soil is, however, suitable for agriculture, and accordingly the trend of industry has been until quite recently towards cattle-raising, dairy products and the fisheries. Nevertheless the capital, Copenhagen, has found sufficient encouragement to become one of the first ports and greatest centers of shipping in the world.

Some years ago, capital succeeded in bringing about the establishment of Copenhagen as a free port. With this step accomplished, the construction of great docks and shipping facilities paved the way to the importation of raw products and industrial supplies, industries were started up on a small scale and foreign capital was attracted, until finally the smokestacks of factories and mills sprang up on every hand, turning the peaceful grazing land into the extended beehives of industry which it is to-day.

Foremost among the manufacturing interests that profited by the widespread activity that throbbed throughout Denmark was clayworking. The extent to which this industry prospered under the growing demand for building materials may be gauged by the fact that the Danish Kingdom now lays claim to no less than 700 brick and tile plants, 300 of which are equipped with steam or other mechanical power; 146 of them employ from 6 to 10 workmen; 86 from 11 to 20; 57 from 21 to 50; 24 between 51 and 100, and 4 over 400 men. A number of plants established during the past three years are still larger. All the plants combined yield an output of 500,000,000 bricks.

Twenty-one of these plants have an annual production ranging between 2,200,000 and 5,300,000 bricks, as will be seen from the following table of works:

Name of Works. Location.	Output.
Floes Brick Works, Strommen, Randers	3,770,000
Bigeager Brick Works, Vejle	4,000,000
Sleth Brick Works, Aarhus	3,900,000
Ellemore Brick Works, Lemvig	2,200,000
Bezgkolm Brick Works, Horsens	3,860,000
Kragelund Brick Works, Aarhus	2,500,000
Vosborg Brick Works, Vemb St	2,500,000
Dangard Brick Works, Vejle	3,700,000
Emiliegaard Brick Works, Aarhus	5,300,000
Seest Brick Works, Kolding	3,000,000
Hollanders Brick Works, Kolding	3,000,000
Hopler Brick Works, Hojslev St	3,000,000
Cjammelby Brick Works, Esbjerg	3,500,000
Overhaved Brick Works, Skive	2,900,000
N. Sundby Stoom Brick Works, N. Sundby	3,500,000
Tastumgaard Brick Works, Stoholm St	3,200,000
Stenderup & Juelsminde, Copenhagen	4,000,000
C. T. Vangs Brick Works, Aalborg	3,700,000
Norre Uttrup Brick Works, Aalborg	2,900,000
Godthaab Brick Works, Aalborg	2,400,000
Bindo Brick Works, Hobro	3,000,000

The above firms, as well as the remaining brickmakers in Denmark, use the moist process exclusively. Hence the equipment of their respective plant is composed of single and double roller machines, pug mills, drain pipe machines with rollers and folders, as well as ordinary brick presses.

Much of this machinery is manufactured in the country by such concerns as F. L. Smidth & Co., in Copenhagen; P. J. Buass Maskinfabriken, in Aalborg, and the Maskinfabriken Svendborg, in Svendborg.

F. L. Smidth & Co. is by far the most important of these

View of the Kilns, Racks and Dryer, Elmwood Brick Co.

manufacturers. This firm not only fits the home plants with high-grade machinery, but enjoys a considerable trade in Russia and the other Scandinavian countries, where their makes rank favorably with those of the most prominent manufacturers of Germany, Belgium and Great Britain.

A vast amount of business is, however, done in Denmark by German and Belgian machinery merchants. Thus almost all the leading plants count in their equipment several machines made by the houses of Scheickeysen, Thr. Groke, Gehr, Pfeiffer and the Meissener Eisengiesserei & Maschinenfabrik, in Germany, and equally well-known firms in Belgium.

Of late American manufacturers of clayworking machinery have also been turning their attention to the Danish market, and the conditions they find there are in the main in favor of American machinery. There is no disputing the fact, as The Clay-Worker has time and again pointed out, that European brick machinery is inferior to the American in more ways than one. In the United States a greater degree of efficiency is arrived at in the clayworking industry, with a less expenditure of time and money, than in any other country. This hard fact

is realized now in all parts of the world where the American brick machine has made its appearance.

With these conditions in their favor, there is no tangible reason why the American manufacturer should not succeed in any market he may enter, provided he is willing to adapt himself to the conditions of the trade he desires to secure. This seems a relatively easy stipulation to agree to, and yet nine-tenths of the American manufacturers who wish to do an export trade have a mind to accept it. Consequently the foreign buyer places his orders elsewhere.

If our manufacturers will meet foreign business half way they will readily find how easy it is to build up an export trade, and how vast the opportunities are for their products abroad. Germany's unprecedented success is ample evidence of this statement.

Taking, for example, Denmark, the possibilities for the sale of American brick machinery are unrealized, but there is one condition which the United States must adhere to in canvassing for Danish trade—namely, in the matter of payment. It is customary in Denmark to pay for machinery in the following ratio: One-third on placing of order, one-third on arrival of goods and the remaining one-third on the erection of the machinery in the plant. As a rule, these conditions are required absolutely, and as they are accepted by all Continent firms, American manufacturers must give the same terms.

UNCLE SAM.

WRITTEN FOR THE CLAY-WORKER.

WATCH THAT BURNER!

D. W. Stookey.

THE NEXT to the largest item of expense for the brickmaker is his fuel. His share of the year's business is the difference between the receipts and expenses. Taking one year with another, his sales and income run near a certain amount. The tendency within the last year or two is for the manager to give more attention to the market and to sales. While this is well he must not forget the homely advice to save, as taught by our fathers.

This has become a "billion dollar" country, our foreign commerce in 1899 amounting to over $2,000,000,000, and the amount of United States money in circulation is over $2,000,000,000. We are accustomed to hear of millionaires and think of business being done in the thousands of dollars. We often read of stock companies being organized and incorporated with capital stocks of hundreds of thousands of dollars for the purpose of making brick. That is easy enough. There is plenty of capital that has been accumulated in other fields that is idle and can easily be caught by the seductive fascinations of clayworking. Observation and experience have taught that there is an attraction in clayworking that capital cannot resist. They have taught also that in clayworking the business must be managed very wisely or the capital invested will be lost. The old teaching that "dimes make dollars" is just as true to-day as it ever was. In order that it should be up-to-date, it must read "dollars make hundreds."

After capital has been seduced into the clay business and the excitement and thrill of charming it have given place to possession the responsibility of investing it wisely and using it profitably faces the managers. Then they must take up the oft-repeated thought that profit is simply the difference between expenses and income. The time has come when they must come down and study the practical details. They must make this invested capital profitable by making a dollar here and saving a dollar there.

At the kilns they will find one of the richest leads into which they must dig if they will win. It is not enough to employ the original capital in constructing such and such a kiln that has a long list of testimonials attached to an ambiguous, descriptive catalogue, telling what it will do, but failing to tell how it can possibly do so much.

It is not enough to use some more of that original capital in employing a "skilled" burner, whose opinion and will are to be law without appeal. It is not enough to expend a part of the original capital in the payment of royalties on some "patent" furnace or coking table, with a "guarantee" attached which does not guarantee anything in the sense of making good all losses and failures, and whose patent does not protect the patentee.

I say it is not enough to insure success by depending upon the powers of the original capital and what it will purchase in the way of equipment. The fact is patent to all who care to look around that financial successes are being made all around us in brickmaking by practical men without the use of a patented or guaranteed device of any kind. It is also true that many instances are around, and easily found, where stock has depreciated to discouraging figures in spite of the use of a good boost in the way of original capital and so-called "best" equipment in the way of devices for utilizing fuel.

Watch that burner!

There is no furnace that will give good results without proper management and attention, and almost any furnace will give fairly good returns if treated intelligently.

Watch that burner!

Ordinarily and in other departments the men work under the directions of those most interested, and so should the burner. A man who has brain power enough to know how to manage the burning on the modern brickyard is worth too much money to wear himself by losing sleep and shoveling coal around a kiln night and day, burning brick, or he commands higher wages than should be paid for that class of work. The managers should furnish the brains and employ men to do the work under their direction. They have not fitted themselves for their positions as managers and should not receive managers' compensation until they are familiar with every detail of the work. They are not doing their duty to the stockholders who pay them for brains, so long as they pay out large salaries or high wages to professional burners. The work on a brickyard is so much the same from day to day, so much of a repetition of the same things that the mental strain upon the managers need not be exhausting. Their time for investigation is such that they should furnish the high-priced ability so often sought in the employment of professionals. They should understand the principles of combustion and adapt them to the furnaces under their care. The practice of throwing a thing out and purchasing a new one to take its place should be used only after those in use have been thoroughly and intelligently tested and proved failures. In practice I have found that if the man who pays the coal bills will put his mind to work on the furnaces they will nearly always prove effective. Here, as elsewhere, the interested mind is most careful and devoted.

Watch that burner!

In practice the burner should be taught how to best tend his fires and should be given reasons for the methods employed. If he is not willing to learn and work under the proper direction, put some one in his place who will. No management can afford to let the hands dictate the methods to be employed.

Recently I visited a plant where the burners clinkered all the fires in the kiln at regular periods during the day and night. This was wrong. When they clinkered all the fires were cooled at once, and all were filled up with a lot of fresh coal. Thus the kiln was cooled and lost time before the fires brightened up again. Soon after the fires burned freely and

became quite hot, having clean grates. From this time on clinker gradually gathered on the grates and the fires produced less and less heat, until the next time for cleaning came. Then they went through another series of changes, and the heat was constantly swinging through a varying series. Burners should remember that kilns need steady, gradual treatment, and not sudden and marked changes.

They should also remember that each furnace is an individual not related in any way to the others, although they all work for the same kiln. Each furnace should be tended, cleaned and fed whenever it needs it, whether the others are ready or not.

The best time to clinker is all the time. Every time the burner goes around his fires let him clean one or two that need cleaning most. By this method the total influence of the furnaces on the kilns is steady and regular, and the burning will advance all the time.

Watch that burner!

(To Be Continued.)

ABOUT CLAY BUILDING MATERIALS.

OUR MODERN architecture has occasioned many new demands, in the way of building materials. In this grand round of advancement the manufacturers of all kinds of clay products are to be included. The brickmakers have been largely responsible for the advancements in the way of the bare structural work, while other fancy clay products enter largely into the exterior decoration of the modern building, and this branch of the clay manufacturing industry is one in which real art is displayed.

There was a time not so long ago that most of the enameled brick used in this country were imported and enameled terra cotta was unknown, but now these economic and artistic building materials are produced by our own manufacturers, and their quality, texture and color are the best. Just how largely these materials enter into the construction of the modern building may not at first seem apparent.

Another clay material for building purposes which has been highly developed in this country in roof tiling. For interior house finishing terra cotta is coming more and more into use. It possesses many advantages of its own in the way of interior decorating, and it is light and cheap. In this and in all other clay products which go into the modern structure there is to-day no occasion to use anything but the best. It has long been the special study of those engaged in the clay manufacturing industry to raise the standard of their products to the highest possible degree of excellence, and in this they have been so uniformly successful that to-day there is no occasion for the use of other than the best obtainable in this line.

I. S. W.

A SUCCESSFUL CHICAGO BRICKMAKER.

WHILE ANTICIPATION is the spur to success, retrospection, after success is gained, is a source of unbounded pleasure, and to a great extent smoothes the rough corners of the various trials and labors incident to the daily routine, the worries are forgotten and only the good retains a place in memory's storehouse. It is my intention to become personal, and the subject of my sketch is as well known as any man in the brick line in Chicago. Adam J. Weckler is practically a native Chicagoan. His parents were married in Chicago in 1841 and moved to St. Joseph, Mich., the same year, returning to Chicago in the fall of 1843, opening a "Farmers' Home" tavern on Kinzie street, between La Salle and Wells streets. In 1848 to 1852 young Adam attended the Wilder School, now the Kinzie. At that time his father also operated six or eight "prairie schooners," carrying emigrants to Milwaukee and other points west and north of Chicago, which afforded the boy a source of amusement never to be forgotten, as he was frequently a passenger and was also of assistance to his father. In 1857 he entered the wholesale grocery business, continuing in that line until just previous to the Chicago fire, when he was in the wholesale cigar and liquor business, but the fateful 9th of October, 1871 left him, as it did thousands of others, with nothing but his experience and an indomitable will, and from this point dates his appearance in the building world. In the winter of 1871 and 1872 he handled some 13,000,000 of old brick, selling at from $9 to $13 per thousand. March 1, 1874, he formed a co-partnership with William Lill in the manufacture of common brick, and upon the death of Mr. Lill, in 1875, he continued the business, besides acting as the executor of Mr. Lill's estate. From that date his progress has been sure. Believing in the ultimate greatness of Chicago, he had the business sagacity to purchase a tract of land on the north branch of the Chicago river in 1879, paying $550 per acre, and at the time some of his more conservative friends considered it a mistake. In April, 1898, he sold 21 acres of this property to the Deering Harvester Co. for $82,500 cash, which proves that his original purchase was anything but a mistake. He is now enjoying a well-earned respite from the exacting routine of business, and while he is at the head of two companies, the Weckler Brick Co., Western avenue and Addison street, with his brother, William H. Weckler, as his associate, and the active manager, and the Weckler-Prussing Brick Co., Blue Island, Ill., with his son-in-law, Alexander Prussing, as active manager, he is satisfied to assume the position of advisor and let the younger men do the hustling. He has been a resident of Lake View since August, 1871, and has occupied his present home for seventeen years, but the Deering sale has necessitated his removal, and he has now in course of construction a fine residence at 435 Evanston avenue. A eulogy as to the worth of a successful man, in any line, is well, as an example for the younger generation, and as a tribute to earnestness of purpose and a determination to succeed, which, in conjunction with honest dealings, is a combination that will "win out" every time.

Adam J. Weckler, Chicago, Ill.

CALORIFIC VALUE OF PETROLEUM PRODUCTS.

A useful thing for those who are experimenting with various forms of oil engines to know is that petroleum and all its products possess practically the same calorific value per pound weight. The weights of the different products vary, and consequently the calorific value is not uniform per gallon. but it is uniform per unit of weight. The best authorities give the heat units in a pound of petroleum as 21,000. At 60 degrees Fahrenheit, 86 degree Baume gasoline weighs 88.4 ounces per gallon, while kerosene weighs 104 ounces per gallon. In other words, the calorific value of a gallon of 86 degree gasoline is to the value of a gallon of kerosene oil as 88.4 to 104, therefore gasoline has 18 per cent less value, gallon for gallon, for fuel purposes than kerosene oil.—American Machinist.

BUFFALO BRICK NEWS.

Business still continues to improve in this city. Sales of over four million brick during September, and outlook bright. People are just beginning to wake up to the importance of the Pan-American Exposition, and as to what will be required of them to feed and house two or more hundred thousand people daily.

We had two large conventions recently, and although delegates numbered about five thousand, complaint was made about being unable to obtain first-class hotel accommodation. Now a canvass has been made, and owners and proprietors report stories to be added on, new buildings to be built to accommodate three thousand out near the grounds. I look for a good fall and winter trade for the brickmakers.

Bro. Alfred Yates, of the Johnsonburg Vitrified Brick Co., was here last Thursday and reports business good. He had just sold 500,000 pavers to L. H. Gipp, to be used in paving Buffalo street, in Hamburg, N. Y. Bro. Yates looked well, smiling and happy; has something new—a flashed brick, that he thinks will prove a winner; has furnished a job in Worcester, Mass., for a high school, also for a large mansion in Washington, D. C.

W. H. Signor, of the Ridgway Press Brick Co., of Pennsylvania, says he has been loaded up with work and orders, too, all reds, and mostly Romans and specials; busy filling a large order in Boston, and had a lot of work in Providence, R. I.; had to turn away orders for over 600,000 in grays since July.

I just learned that a new brickmaker has started to work right here in this city, and not a machine man has called upon him as yet. I am told he has a helper, and is hand-molding brick and drying them in the sun. They are to be used in building adobe huts for the Mexican village. The brickmaker and helper were imported from Mexico. They wear immense sombreros, but their mode of manufacture is similar to the old way of hand-molding. I am going out to see him next week, and will make a fuller report in my next. NORTON.

Buffalo, Oct. 12, 1900.

A HAND POWER BRICK PRESS.

THE accompanying cut is an exact reproduction of the Grath hand power press, which is conceded to be the only perfect hand power press in the market. Brick made on it are equal to those made on any large steam power press, as a pressure of 2,000 pounds per square inch is applied to the clay, the result being that the brick pressed have a smooth and polished face, and are free from granulation, with perfect corners and edges. Two men can make all the way from 800 to 2,000 per day, depending upon the size and shape made. This press is so arranged so that any size brick, from 12½ inches long and 10 inches wide, and from 1 to 4½ inches thick, can be made on same. The clay should be in the same condition, both as to moisture and fineness, as for any large steam power press. This press is giving perfect satisfaction to all users of same, as will be seen by the following letter received from one of the manufacturers who has the press in use. No brickyard is complete without a press of this sort, for all sizes and shapes of ornamental brick can be made on this press, with less cost than on a large steam power press.

For further information address The Illinois Supply and Construction Co., St. Louis, Mo., U. S. A.

D. J. Clahane, Pres. Sam'l Borger, Treas. C. H. Forry, Supt.
Jno. H. Rodgers, Sec'y.

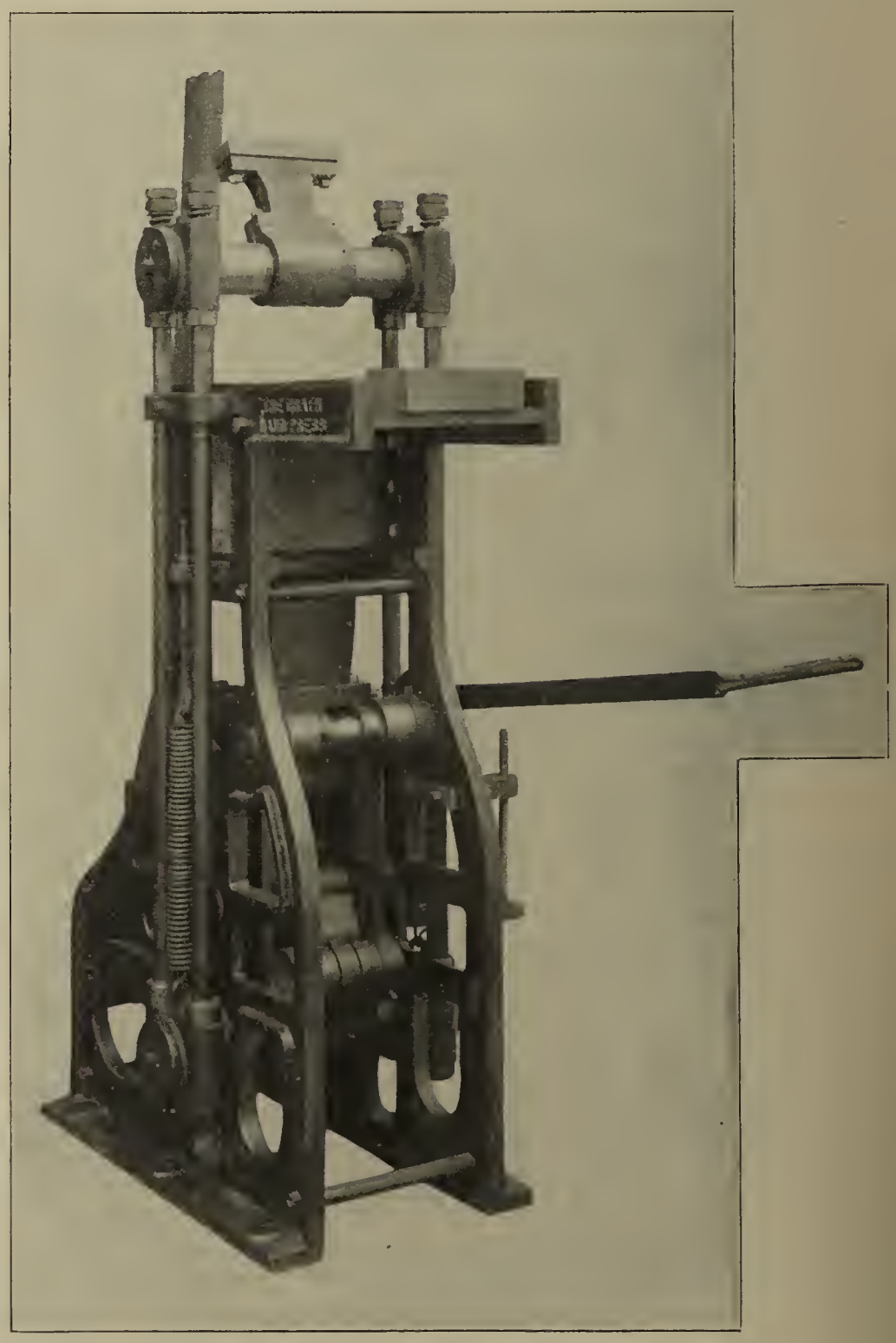
THE HANOVER PRESSED BRICK CO.,
Manufacturers of
PRESSED BRICK, RED BUFF & TERRA COTTA COLORS.
Also
ROMAN, SHAPES AND GROUND ARCHES.

Gen. Office. Columbus, Ohio. Works. Hanover, Ohio.

Columbus, Ohio, Oct. 1, 1900.

Illinois Supply and Construction Co., St. Louis, Mo.:

Gentlemen—In reply to your favor of the 29th inst., beg to



The Grath Hand Power Brick Press.

say that last spring we put a Grath Hand Power Press in at our brick plant, and can cheerfully recommend it.

The machine has given perfect satisfaction in every respect, and we have been making from 1,000 to 1,200 brick per day with our clay.

We have no doubt but that the capacity could be increased with other clay. Yours truly,

THE HANOVER PRESSED BRICK CO.

BRICKYARD SENSE AND NONSENSE.

I WAS OVER in a big mudyard the other day when a heavy northerly rain and hailstorm came up. The striking crews were ordered to quit and wash up, and half a dozen or more young fellows were soon stripped and splashing about in the pond that set in plain sight of the kiln and but a few feet away from it. Just as the men had begun to make for the shore to dress a picnic party of typewriter girls fled to the kiln ground from the adjoining fields. And they stayed right there for an hour, or till half a dozen sets of teeth were knocking themselves to pieces in the millpond and half a dozen faces grew purple and pinched with cold, and half a dozen voices began to imitate the agonizing moan of bullfrogs. Then one of the prettiest of the typewriters remarked innocently: "Mercy sakes alive, girls! Do see those men in bathing in such a storm. One would think they would find it too chilly for enjoyment." "Yes," said another innocent darling, "and they seem to like it, too, for I notice they just sit round in the water as we girls used to have to do at Long Branch." "Isn't it nice to be a big, tough man," said another miss. "How nice it must be to be able to find enjoyment in sport that would be direst hardship to weaker people!" Then a chattering chorus broke from the surface of the pond: "Say, girls, you'd better git! See? We're stark naked and we got to come out! See? And we're coming out, too, see?" But the girls didn't wait to see.

* * *

They were two stalwart old manufacturers way down in Maine along in the early thirties. Both were successful men, self-made, all wool and homespun, but with very slight acquaintance with Lindley Murray's text books. They had been life-long friends and each had many a time filled for the other a hurry order that came too quick and urgent for his plant to meet. It was on one of these occasions that the rock upon which their friendship split arose. Jones had asked Smith to take care of a hurry order for him and have it shipped without delay. Smith willingly agreed, but before he could begin shipping his own customers were so clamorous that he was obliged to defer Jones's shipment for two days. When Jones heard of the delay and found Smith filling the orders of his own patrons to the neglect of the order submitted to his care by Jones, he waxed exceeding wroth, and the hot exchange of sallies that ensued would have put the Dewey-Spanish duel at Manila in the shade. Then, exhausted in body and spirit, Jones strode sternly to his office and grabbed his pen. And this was the note that the mail brought in the morning:

"Jason Smith: No more nonintercoarse—dam you.

"WILLIAM JONES."

And the friendly intercourse of many years was ended. The grandsons of Smith show the note occasionally to the grandsons of Jones, and then they all smile at the expense (or at least from the pile) of the granddads.

* * *

They ran short of sand to shake on the new-laid bricks at one of the mudyards early this season, and the fertile fancied boss ordered the tread-tenders to shake the ashes from the arches on them. As a prevention of cracking in the sun the ashes were a grand success, and the bricks in handling were soft as velvet, but by the time two or three arches of them had been set the men's fingers were bleeding from mysterious cracks that had manifested themselves. When the ashes-covered bricks were all set in, the mysterious soreness in the hands disappeared as mysteriously as it had appeared. But when that kiln was burnt! Oh, what a sight was there, my countrymen! It was the meanest and nastiest imitation of whitewashed brick that ever was concocted. They disfigured the kiln and seared the landscape, and the proprietor was disheartened and the boss got a blowing up. Thus they stood for an interminable period, until a rusticator came to buy brick for his new cottage. The best in the kiln was none too good and he asked for the best and the best prices for the best. Both were laid before him. He was not satisfied. "But you have not quoted on these," he said, turning to the disgraceful pile. "Oh, those I do not expect to sell," said the proprietor somewhat bashfully. "Ah," said the purchaser. "I see. You have made them for your own use, perhaps?" "Well, you might put it that way," remarked the proprietor. "That being the case then, can you not make some more if I give you $5 a thousand more than your best price of your best?" asked the rusticator. The proprietor felt very faint, but he managed to say that he could make more of them, though he added a mental reservation that he'd wait for another freak order for that kind before he rushed it.

* * *

Anybody who ever began his apprenticeship in the brickyard by daubing up mouths and peepholes for the burners can shed a bucketful of sympathetic tears on the misfortune of the subject of the sketch. He was a dauber and a wood-wheeler, or, rather, he was a first-class wood-wheeler, but a poor dauber. He was willing, but he could not learn to daub the cracks, and for this he got many a round dressing down from the burner, until he grew thin and as nervous as a cat. His fellow wood-wheeler and dauber was a first-class hand at daubing cracks, but an indifferent wheeler of wood. They got the head all daubed and got a big pile along and laid down by the "outside" to snooze awhile. They snoozed peacefully for half an hour, when biff! bang! howp; whoop! swoosh! There was terrible goings on. The crew found the two daubers engaged in frightful conflict. The good dauber had the bad dauber down and was sitting astride of him and earnestly endeavoring to hammer a hole in his poll with the blunt end of a green brick. The good dauber's ear and one eye was full of mud. His nose looked like a piece of stucco and now and then he spat gobs of clay from mouth between blows. The bad dauber was with difficulty rescued from the wrath of the mad dauber and sent to the rear for repairs. A long while afterwards he regained his nerves and said that as they slept he kept his daubing point handy by in case his burner called for him to plug a crack; that as he slept he dreamed that he had a dreadful mouth to daub, but could not make the mud stick. Before he had the satisfaction of seeing the mouth well daubed he was awakened violently by his companion, who, he thought, was taken suddenly insane. 'Twas all a mistake, but they don't sleep together now.

* * *

I wish to say that stupendous success would follow if every clayworker in America should imitate the example of young Mr. Brooks, of Orrington, Me. Mr. Brooks runs a tile plant in the hollow of the hills of the Penobscot river, seven miles from the city, and out of sight of any habitation. It is such a modest little plant that one might be within a stone's throw of it and never see it, and I am sure there are many persons in his own town who never knew of its existence until recently. They know of it now. And they know more about the advantages of draining their farms, thanks to young Mr. Brooks. For their benefit and his own benefit Mr. Brooks has written and had published a scholarly and instructive little essay on the need and uses of tile draining, which he has distributed over quite an extent of Maine territory. Mr. Brooks is an enthusiast in his belief in the future of the clay industries throughout the land. He believes in his calling and believes in letting the world know some of the things it misses through its ignorance of the value of clay wares. Brickmakers, tilemakers, every sort of clayware maker must begin a campaign of education. The needs of the coming generations must be anticipated and provided for. The clayworker has a great mission to perform, a duty to posterity that cannot be shirked. We younger men are going to see country highways brick paved and city mansions brick roofed, and "absolutely fireproof" buildings brick-built, brick-partitioned, brick-tiled and brick-roofed. I believe the brick era is about to dawn. And humble Brooks is a forerunner.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted. For Sale, etc., columns a means of satisfying their needs.

WRITTEN FOR THE CLAY-WORKER.

CAPITAL BRICK AND BUILDING NEWS.

"QUIETNESS' IN THE BRICK business at the Capital City, spoken of in my last letter to The Clay-Worker, still obtains. There is no rush, but output continues moderately, and prices are steady and good as in spring and summer. Real estate sales are not effected as easily as was the case a few weeks ago, on account, it is said, of the political fever that is now heating up the land, bringing, as usual, its disturbing influence that tends in some measure to unsettle business.

Just why men should get thus "switched off" is something of a mystery; but the fact remains that there is at present here a wait-until-the-election-is-over spirit prevailing. Still business is not at a standstill; money is to be had on easy terms, and in quantity to suit; brick, as stated, are being made, and building is going on—and will go on regardless of a choice of a presidential candidate, or the election of both of them—which, as the man from way-back remarked, "Can't be did."

The larger number of houses being built are of small size, ranging in cost from $3,500 to double this amount, but this season's operations in this line have embraced not a few big structures, among these being the school building for girls, erected by Mrs. Phoebe A. Hearst, at a cost of $200,000. The edifice is situated in the District, outside of Washington, on the Tennallytown and Woodley roads; it is composed of limestone and brick, and is thoroughly fireproof. It has a steel frame, staircases of iron and marble, and wainscoting of marble and tile. The style is of the Italian renaissance, and the size gives room for one hundred boarding and as many day pupils.

Other large structures being built in D. C., outside of the city, are Trinity College—for girls—and St. Vincent's Orphanage, both nearing completion, and both in the same neighborhood, about one mile northeast from city boundary. The college is an immense building of Port Dposit stone and brick; the orphanage, a brick edifice, with limestone and terra cotta trimming. The latter structure is E-shaped, with the three wings fronting inward and forming two courts. The front is 235 feet in length, having a central tower and a series of oval gables; depth of center wing is 136 feet, and height five stories. Pressed brick were used for the edifice, the number being about 2,000,000, which, with their brown terra cotta decoration, make a very artistic and imposing effect.

In the West End—the bonton part of the Capital City—a number of fine residences are being built, and their individual cost ranges from $25,000 to nearly half a million. One of the very costly of these, on Massachusetts avenue and Eighteenth street, will be composed principally of terra cotta. Further down town—on Pennsylvania avenue, near Fifteenth street—the new Riggs Bank is nearing completion.

This building, though simple in architectural style, is quite attractive. Its sides and back wall are of red brick; the front of granite. It is 154 feet deep, 54 feet wide and 66 feet high. The vaults are of brick and will be steel lined, and the whole structure will contain 1,500,000 brick. A peculiar feature of this bank is the thickness of the walls—2 feet, 6 inches. They rise up in a single, lofty story, to the copper roof, wherein is set a thick glass skylight. In front of the building, on each side of the broad entrance, a huge fluted granite column, nearly 4 feet in largest diameter, and topped with Ionic capital, rises to the frieze, and these give the structure an imposing appearance, and redeem it from severe plainness. The cost of the building will be about $150,000.

The new Riggs Bank is located within a few feet of the old bank of that name, which was one of the first United States banks in the country, and one which has had more famous men for depositors than any other such place of business now in existence in America. Senators and members of Congress, judges of the Supreme Court, celebrated government officials, and many others who lived in Washington in the long-ago, and many of more recent years put their cash in this bank, and not a few of our chief magistrates have taken their "rolls" from the White House—only a short distance further up the avenue—to the Riggs Bank for safe keeping.

Mr. W. W. Corcoran, Washington's greatest philanthropist, who gave to the city the Corcoran Gallery of Art, the Louise Home, for poor gentlewomen, and the Church of the Ascension, was associated with Mr. Riggs in the banking business in the old building mentioned; and while thus engaged these two men negotiated the loan for the United States made necessary by the Mexican war. Out of this transaction these bankers made a large sum of money, a great deal of which was invested by Mr. Corcoran in Washington real estate. One of his purchases was the mansion situated on the corner of H street and Connecticut avenue, and once the property of Daniel Webster. Its next occupant after the great orator and statesman was Richard Pakenham, Minister from Great Britain.

The homes of the foreign legations in Washington form interesting features of the city's architectural makeup. A few of these places are owned by their home governments, and the ground upon which they stand, although in the United States, is really foreign soil. Those thus situated are British, German, Austro-Hungarian, Mexican, Japanese and Corean. Improvements have recently been made in the Austro-Hungarian ambassador's home, consisting of a two-story office building in the rear of the main building. This is situated on Connecticut avenue, opposite the British legation, which building has lately been having an addition constructed also for office work, and to give more room to the ambassador's household. The improvement will cost about $15,000.

Queen Victoria's American possession in our Capital City was one of the first of its kind here, and was also one of the first houses with any pretension to style built in the now fashionable West End. Its cost was $125,000, but the property is now worth several times that amount.

The house is large, and with its outbuildings takes up a goodly portion of the square of which it is a part. Its material is red brick, outlined on south and west part of the building by broad, horizontal white stripes. English ivy clings to the walls, shade trees adorn the grounds, and, altogether, this little domain of Her Majesty is a most charming place outside, while inside there is comfort and luxury. The rooms are spacious, the entrance hall wide, and from this fine oaken stairs lead upward. Sir Julian Pauncefote is well housed in his fine brick palace, where he sits and figures on the diplomatic game.

Uncle Sam's building enterprises in his government city are not making race horse time. The Attorney General has not yet dug up a spadeful of dirt for starting his new official quarters, because he still thinks a brick building would not fit the dignity of the office, the home for which he desires to be in a stone edifice. There has been only one little million dollars appropriated, so far, for the building, and it is a pity that Justice should be so poor and homeless, when there are so many people looking for it and howling because they can't get it. Some are throwing building bricks at it and these it is trying to dodge.

The Government Printing Office is getting its steel framing up and such huge framing! the like has seldom been seen in these parts. When all of it is assembled the weight will be 6,000 tons of steel, with a casing of some ten million bricks. But it requires a very strong structure for the big book and pamphlet factory where heavy machinery will deal with heavy-thought products. The work on the printing office has been retarded, it is said, by a mistake made by the manufacturers in the length of the steel uprights—they seem to have been too long, and gave to the building an additional height of some inches.

The 1,500,000 enamel brick to be used in this new printing shop were accepted at $63 per thousand. Bids as low as $47 per thousand were offered, which goes to show that enamel can be made in this country and sold for far less than $100 per thousand, which your Uncle Samuel has been made, in the not distant past, to shell out for foreign enameled brick. Such brick can be made as good in this country as anywhere, and they ought to find a market here. "Render unto Cæsar the things that are Cæsar's."

NICODEMUS.

THE KAOLINS AND FIRE CLAYS IN EUROPE.

By Heinrich Ries.

(Abstract of article in Annual Report of U. S. Geological Survey. Revised for the Clay-Worker by the Author.

UCH KAOLIN AND FIRE CLAY is annually exported from Europe to the United States, partly because it can be obtained cheaper, and partly because some of the materials imported have not been found in this country until recently, but as the development of clay deposits in the United States increases it becomes of value to know what the character of the imported material is like so that newly discovered beds on this side of the ocean can be compared with ...

To facilitate this work, a collation has been attempted of the information bearing on the character of the more important kaolins and fire clays. The information concerning European clays and clay products is scattered through the technical journals devoted exclusively to the clay-working industry, but even here there is not an excess and competition has tended to restrict the publication of tests. From time to time, however, investigations of one or the other well-known clays have been published, some of them the results of detailed studies. The work of Bischof, Seger, and Hecht has added much to our knowledge of the plastic materials of Europe and their technology, and the work of Seger especially commends itself to all those interested in this subject.

Many of the facts presented here are based largely on notes collected by the writer during the summer and winter of 1897, during which time most of the important kaolin and clay deposits were visited, and to them are added such facts of importance concerning the clays as have already been published.

Those desiring to obtain information concerning the extent of the clay product industry in Europe, especially in Germany and Austria, are referred to the "Adressbuch der keramischen Industrie," Coburg, 1896, as in these pages it is not possible to go beyond a discussion of the raw materials.

The grades of clay which are of especial interest to Americans are those used in the manufacture of porcelain, white earthenware, and glass pots and blocks for tank furnaces. So far as porcelain materials are concerned—viz., kaolin, ball clays, quartz, and feldspar—the United States probably has supplies of them equal to those of Europe, but comparatively little porcelain is manufactured in this country.

—Preparation of Pottery Materials.—

All of the foreign kaolins, except those at Coussac-Bonneval, in France, have to be washed before being sent to the market, but sometimes the washing is done at the factory, as in the case of the Royal Porcelain Works in Berlin. At some factories only kaolin, quartz, and feldspar are used in the manufacture of porcelain, but generally a certain amount of plastic clay is added, especially if large objects, such as plates, are to be made. The relative proportions of kaolin, quartz, and feldspar used vary according to the style and grade of the ware and the manner in which it is to be formed. The feldspathic kaolins of Limoges need the addition of quartz, and in some factories a little carbonate of lime is added. The quartz and feldspar are usually calcined first, the red spar of Norway and the cloudy flints from the North Sea both calcining to a white powder. This process also serves to break up the material and prepare it better for grinding.

Rolls of granite or other stone were formerly much used for grinding the quartz and spar, but mills devised by Alsing find almost universal application at the present day, as they are far more economical of power and possess greater capacity. The old stone mills yielded angular, the latter give round grains. The Alsing mill consists of a horizontal sheet-iron cylinder through which an axle passes. Both the interior of the cylinder and the axle are covered with wood, and over this there is a covering of porcelain about 1¼ inches thick. A mill of medium size is 3 feet long and 4 feet in diameter, and is filled with 350 pounds of rolled flints and the same quantity of charge. About two charges a day can be ground. The kaolins used show a varying rational composition, those of Zettlitx and Cornwall being high in clay substance, while the Prussian and French kaolins often have appreciable amounts of feldspar, but as the foreign manufacturer is usually thoroughly familiar with the rational analysis of his clays he is able to correct it accordingly.

The effect of excessive grinding on the ingredients of a porcelain mixture has recently been shown to be serious.[1] It was found that if a mixture of kaolin, quartz and feldspar was ground in a ball mill for 120 hours, the ware in burning became blistered and showed a finely vesicular structure throughout. If, on the other hand, only the quartz and feldspar were ground for 96 hours, and the kaolin then added, the result was a strong, translucent porcelain of normal color and free from blisters. The experiments suggest how porcelains which are only slightly transparent can be made more so.

Much attention is paid to the preparation and mixture of the clay, for years of experience have proved this to be a matter of the highest importance, and for this purpose all large factories have storage tanks where the mixed clay is piled up and allowed to remain until used, it remaining two years at times. When taken from the storage bins for working into forms it is first thoroughly wedged, to insure the production of the necessary homogeneity in the mass. This operation was formerly done by hand, but in recent years an excellent form of kneading machine has been introduced by Mr. P. Faure, of Limoges. It consists of a circular table about 6 feet in diameter, whose upper surface slopes outward. On this are two conical rolls, 20 to 30 inches in diameter and about 18 inches wide. These rolls have a corrugated rim and are attached to opposite ends of a horizontal axis having a slight vertical play. The clay is laid on the table, and as the rolls travel around on it the clay is spread out into a broad band. A second axle carries two other pairs of rolls of the same shape, but smaller size, which travel around in a horizontal plane. These rolls press the band of clay together again. In this way the clay is subjected to successive vertical and lateral pressures, and all air spaces are thoroughly eliminated. The rolls make 10 to 12 revolutions per minute, and a machine kneads two to three charges per hour of 350 pounds each. The introduction of this type of machine into American factories is well worth considering.

Even among porcelain mixtures Hecht shows that there is a considerable variation.

—Composition of Mixtures for Making Hard Porcelain.—

	Per cent.
Clay substance	40 to 66
Quartz	12 to 40
Feldspar	15 to 30
Carbonate of lime (at times)	6

The variation outside of these limits should be very small, for if the clay substance gets under 40 per cent. the refractoriness decreases considerably, as does also the ability of the ware to withstand sudden changes of temperature. Coupled with a fair refractoriness there should be a low shrinkage, and experiments have indicated that the use of porcelain sherds ground up gives a much more homogeneous mass than can be obtained by the use of quartz.[2]

---

[1] Dammer, Chem. Tech., Vol. I, p. 773 et seq.

[2] Chem. Zeit. 1895, p. 89, and Keram. Rundschau, 1895, p. 129.

One mixture of this type is as follows:

—Composition of Porcelain Mixture for the Production of Bodies of Low Shrinkage.—

	Parts by weight.
Quartz sand	120
Feldspar (Norwegian)	85
Marble	3
Zettlitz kaolin	60 to 70
Porcelain sherds	20 to 60

It has also been found that porcelains rich in fluxes are soft, while those poor in these ingredients are hard, and the most plastic masses do not always show the greatest shrinkage. The shrinkage of Seger's porcelain, which is rich in fluxes, occurs mostly in drying, and the total linear shrinkage is 10 per cent.; it expands in firing when a certain temperature is reached, owing to the high percentage (45 per cent.) of quartz which it contains. Plastic clays give a very smooth surface and are difficult to dry, and are not adapted to the manufacture of large pieces, while a mixture poor in fluxes, and with a high shrinkage, can be very lean when it contains no sedimentary clay but kaolin as the plastic element. Bodies of good plasticity, but low in fluxes, are of comparatively recent introduction, and are especially adapted to large objects and chemical stoneware.[1] Owing to its high percentage of clay substance and low fluxes, the mass acqüires little translucency when burned at high temperatures, but stands temperature changes very well.

The old theory that white earthenware and porcelain were made from mixtures of somewhat definite rational composition turns out to be in error, according to the researches of Hecht. It was formerly supposed that in white bodies free from lime a preponderance of feldspar in the mixture was confined to porcelain, but Hecht finds porcelains poor in feldspar, and earthenware bodies high in it, the facts being proved by the following examples:[2]

—Comparative Compositions of Porcelain and White Earthenware.—

	Japanese porcelain mixture.	Wegeli porcelain mixture.	Belgian white earthenware mixture.
Clay substance	49.44	81.37	58.56
Quartz	45.36	5.53	30.36
Feldspar	5.20	13.10	11.08
Total	100.00	100.00	100.00

The conclusions are that the difference between porcelain and white earthenware depends on the temperature at which the material is burned, viz., to vitrification or incipient sintering, and not on the composition.

Some porcelains are vitrified at a temperature of only 2,400 degrees F. (Seger's cone 9.) Examples of this are Seger's porcelain and Copenhagen biscuit ware, whose rational compositions are as follows:

—Composition of Seger's Porcelain and of Copenhagen Biscuit Ware, Vitrifying at 2,400 Degrees F.—

	Seger. Per cent.	Copenhagen. Per cent.
Clay substance	25	32
Quartz	45	..
Feldspar	30	68

These bodies when burned show a glassy, conchoidal fracture. As the feldpsar is that part of the porcelain which brings about the vitrification, we must assume from the Japanese and Wegeli porcelain mixtures, given above, that a much higher temperature is required to sinter them than the Seger and Copenhagen mixtures.

It is possible to find mixtures showing all grades of transition in composition between white earthenware and porcelain.

As to the behavior of easily fusible white earthenware glazes and porcelain glazes on these transitional members, Hecht finds that a great number hold without crazing on bodies having the following composition, whether burned in a hard porcelain fire or moderate white earthenware fire:

—Composition of Bodies on Which Many Earthenware and Porcelain Bodies Do Not Craze.—

Per cent.		Per cent.
80	Clay substance	30
20	Quartz and feldspar	70

The degree of tenacity with which the glazes hold depends on the temperature at which the biscuit and glazed ware is burned, and to a greater or less extent on the relative amounts of kaolin and plastic stoneware clay in the body.

The practical value of the above observations is that it points toward much greater possibilities in underglaze decoration, for while in the past such work could only be done under hard-fire glazes, we can now paint the porcelain with underglaze colors hitherto used only for white earthenware and cover them with easily fusible muffle glazes.

(To be continued.)

[1] Chem. Zeit. 1894, p. 821.

[2] Thonindustrie Zeit. 1897, No. 21, p. 714.

VALUABLE MATERIAL FOR POTTERS, SEWER PIPE MANUFACTURERS, ETC.

It is only within recent years that the pottery industry has begun to receive the scientific investigation which has so benefited other industries. These investigations are still very fragmentary and incomplete, and no book has yet been published which attempts to give an adequate account of the results already obtained. Even the methods of observation and comparison, which are the foundation of all scientific progress, are not properly described or commonly known among potters.

Realizing this, The American Ceramic Society, through its Committee on Equivalent Weights, Prof. Chas. F. Binns, chairman, director of the New York State School of Clayworking and Ceramics; Prof. Edwin Orton, Jr., E. M., director of the Department of Clayworking and Ceramics, Ohio State University, and Dr. Wm. H. Zimmer, Ph. D. (Berlin), chemist of the Wheeling Pottery Company, has prepared and issued a "Manual of Ceramic Calculations," which embodies the modern methods of calculation of the formulae for bodies and glazes, and which to a great extent places the tools and methods of science in the hands of the practical potter.

The aim of the society is to disseminate knowledge on the whole subject of ceramics, not only among its members, but among all English-speaking potters and clayworkers. With this object in view, the manual has been kept as simple in form and diction as possible, so that all potters who have had even an elementary course in chemistry and are familiar with merely the fundamental conceptions of that science, will be able to follow its calculations and understand its reasoning. By a diligent study of this book, they may soon gain an intelligent appreciation of the great work which has been done in this field in the last two decades, and better still, the power to reap the benefits in their own immediate business.

The treasurer is prepared to mail copies of the Manual to any address, at $1.00 each. Volume II. of the Transactions of the Society, containing the papers and discussions for 1899-1900, including the Manual, can be had for $4.00 each.

Address all correspondence on the subject to

STANLY G. BURT, Treasurer.
Rookwood Pottery Co., Cincinnati, O.

YOUR VACATION.

By no means neglect your vacation. The best days of the year lie between September and November, and if the hard grind of work has shifted your holiday into the tail of the summer so much the better for you. Those wise, bespectacled fellows, the statisticians, have found that a man can work only about three hundreds days in the year with safety. Even the healthy youngsters in European armies are incapable of more. Therefore, it stands to reason that a business man carrying a brain full of affairs Sundays as well as week days would better toss work aside for mere health's sake. So lay down the pack and vacate before snow threatens.—Ad. Sense.

Patent Suit Decision.

The suit of Messrs. C. & A. Potts & Co., Indianapolis, against the Anderson Foundry and Machine Works for infringement of disintegrator patents was decided in favor of Potts & Co. by Judge John H. Baker, of the United States Court, October 18, and an injunction granted. The case will be carried to the Circuit Court of Appeals.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

A Rational Method of Burning.

Editor Clay-Worker:

We have just finished our season's work here. It has been a very wet season for a hand yard, and as it was late in the season before we got started, we have not done much. We have made two small kilns of about 50,000 each. We had to make yard, make a dam for water and buy necessary tools, etc., and after all, will make both ends meet. There is another yard here that has made about 50,000 not yet burned. Millions are used here which have to be shipped in, so you see there is a good opening for an enterprising brickmaker, who has the money and the sand to put in a good plant.

We are selling for $8 at kiln or $10 delivered at North Sidney, which is about three miles distant. When I commenced to burn my first kiln I was told it would take about ten days to burn. I started fire Monday morning. As our kiln was not shedded in I sealed up the mouths of the arches on one side, as the wind was on the other, fired from one side only till water smoke was off, thereby saving fuel, which would have been blown into the wide world by firing both sides before the kiln got warm enough to draw fire in from both sides. Fired from both sides Thursday morning; finished the following Sunday, midnight. Hard brick within three courses of top.

I never heard of any one burning that way before, but I think it a fuel saving system under the circumstances.

Leithes Creek, C. B., Nova Scotia, Sept. 18. DERRY.

Good Roads—The Wheel Track Project.

Editor Clay-Worker:

In acknowledging the receipt of The Clay-Worker our attention is called to a very interesting letter from "Burton" on "Good Roads—A Paying Investment." As an advocate of good roads and plenty of them, we are much encouraged in the present outlook for greater activity in road improvement.

Your correspondent being a radical, naturally turns his thoughts in search of new methods, other than expensive macadamizing, which seems illy adapted to the necessities of our poor locality. Some of the States are making progress towards improving their outlying districts, but at great expense of labor and material, which might be cheerfully borne, were they not confronted with an enormous future tax for annual maintenance. We advocate a wheel track for country roads, inasmuch as the track principle having solved the problem of land transportation, it would be the part of wisdom to incorporate the same in the improvement of our highways.

A wheel track composed entirely of vitrified clay, with ample turnouts, can be constructed at a cost of $2,000 per mile. This, in connection with a nominal sum for maintenance, places the financial part of the good roads question in a very desirable light, in fact, makes good roads a possibility. There are grave doubts in the minds of many of the friends of the cause as to the efficiency of this method. This is mere prejudice, which would be early overcome, provided we had a few object lessons giving a practical demonstration of its merits.

Under Mr. Dodge's administration of the "Road Inquiry Bureau" an exhibition was given at the Omaha Exposition of a steel rail track. While we scout the idea of steel rails for country roads, nevertheless, we rejoice that the government has done that much toward the enlightenment of the people upon the merits of a single track.

After years of experimenting, we have become firmly grounded in the belief of the merits of "burnt clay" for highways, in fact, there is no other material so well adapted for surface or underground work, and the sooner we get down to the idea, the more rapid will be our progress in substantial improvements, which will redound to the credit of the nation, for it has been truly said, "that the intelligence of a community can be measured by the conditions of its public highways."

O. L. DEFOREST.

A Query.

Editor Clay-Worker:

Please find inclosed $2 to pay for Clay-Worker for one year, beginning with September issue.

In regard to D. B. Chamber's inquiry in August number, it is my opinion that he does not need another kiln as much as he does more time for burning. He says he burns in 110 hours. If he will double his time, say make it 220 hours, he will find his arch brick more satisfactory. He should allow as much or more than his present time for water smoking.

Have any of the readers of The Clay-Worker had any experience in getting clay out of a marsh that is regularly overflowed by the tide? If so, their experience given in The Clay-Worker or correspondence will be greatly appreciated.

Durmid, Va., Sept. 15, 1900. J. J. BLANTON.

The Chicago Brick and Building Situation.

September Shows a Marked Revival.

Editor Clay-Worker:

The building interests of Chicago experienced a general revival in all lines for the month of September, which was both appreciated as well as unexpected. Dealers in stone, lime, common and pressed brick report a gain of from one-third to one-half in volume of business as compared to July or August, and the gain is in comparatively small jobs in all sections of the city, and it is a fact worthy of mention that at no time in the growth of the city has there been so few large buildings in course of construction in the down-town district as at the present time. The building permits for September figure nearly $3,000,000, the best month for the season. Money is plentiful for real estate and building loans, ranging from 3½ to 6 per cent., as the location of the property will warrant. As real estate usually is at the tail end of business revivals, the prospects are favorable for the beginning of a season which will demonstrate in 1901 what this present year should have been.

One feature of the present rush is the scarcity of teams, which is felt not only in the building lines, but in the street-paving work. To the irreverent, this scarcity of horse flesh might suggest activity in the sausage trade. Speaking of eatables, Mr. H. H. Kohlsaat, not satisfied with taking the cake in the newspaper field as proprietor of the Chicago Times-Herald, will do so in a literal sense by building the most complete plant for hand-made bakery goods in the country.

Oak Park, our progressive suburb on the west, is to have an auditorium at an expense of $75,000. The plans are as yet incomplete, but the incorporation has been perfected and material men will soon have an opportunity to make life miserable for the building committee. Among the larger operations started in September are nine three-story flat building for H. L. Newhouse, cost $90,000; a three-story apartment building, for C. J. Trayner, cost $40,000, for the South Side, and to the credit of the West Side is an eight-story factory, cost $40,000; also a factory addition, cost $60,000. And why this activity in the face of conditions which one month ago threatened destruction to all building and manufacturing interests? It is because the rank and file of labor have repudiated their blatherskite leaders, under whose direction they have been for the past eight months, fighting against prosperity and diverting from their special lines millions of dollars.

The first breach in labor's ranks occurred with the withdrawal of the bricklayers' and stonemasons' unions from the building trades council. This was an opening wedge; rumors came thick and fast as to the dissatisfaction of various branches of the council, and some of the leaders sought pastures new. The business agent of the gasfitters' union is reported to have left the city, and is now actually working at his trade in New York. The business agent of the sheet metal workers is reported in three different places at once, following his trade, and even the walking delegates break into print with the complaint that their duties have now assumed such proportions that its really hard work to perform the demands of their office, and of all ingratitudes, the one-time president, guide and mentor of the building trades council and president of the plasterers' union, Edward Carroll, has been fired from all official position and is known no more at headquarters. His old-time friends of the plasterers' union hope in time, with proper

nursing and the necessary exercise attendant upon a revival of business, to restore their respective legs to equal lengths. The deposal of Mr. Carroll from his union was theatrical in action, but effective. Having a premonition of his defeat, Mr. Carroll caused their hall to be occupied on the night of their regular meeting, but the members, not to be cheated of their diversion, adjourned to a livery barn, across the way, and in short order Mr. Carroll was skinned, the pelt nailed to the door and a three-year agreement signed with the bosses. The place selected for their emergency meeting would at least give to their deliberations an air of stability.

On the heels of the general dissolution of the council, comes the newspaper reports of a benefit given by the building trades council of New York to the "locked out workmen of the building trades in Chicago" the 1st inst., claiming $4,000 realized. Had this occurred sooner, and the cash actually remitted, the break-up would have been delayed a week or so longer.

The headquarters of the masons association were roused from their lethargy the 3d inst. by the invasion of Business Agent Higgins, of the bricklayers' union, who used too much zeal in trying to secure converts from the industrial union, which is a bone of contention between the masons and the former Carroll combination. The interview sought by Mr. Higgins was productive of immediate results. There was a show of guns, much bluster, and in the finish Mr. Higgins found himself in the street, much worse for wear. At the present time both the unions and contractors are entitled to sympathy. Having been in the public eye, as it were, for the past nine months, and then to find that the yawp of the compaign orator is to them as a damp cellar is to the dainty violet, is, indeed, hard.

From present indications, after the aforesaid orator is choked off by the election, the leaders of the unions and the guardians of the public welfare, as represented by the building contractors' council, will have to do some tall sprinting to catch up with the procession. Mr. J. P. LaBahn, an old brickmaker of Chicago, has purchased a tract of land at Evanston, upon which he will construct a modern common brick plant of 500,000 capacity daily. This will not be in connection with the Illinois Brick Company, which would prove that large combinations are not as black as some of our political friends would have us believe. I have some more gossip on tap, but a wholesome fear of your official blue pencil forces me to subscribe myself VERITAS.

Chicago, Oct. 10, 1900.

Good Business and Good Resolutions.

T. A. Randall & Co.:

Gentlemen—Our paving brick business is good, and we are pleased to say has been good throughout the season. We are now engaged in filling a large order from Rochester, N. Y., for paving purposes. It will take two-thirds of our output for the balance of the season. It is our candid opinion that the paving brick industries of this country are now better established than any or all of the other paving industries combined.

We are always pleased to see The Clay-Worker each month. We will be glad to learn where the next N. B. M. A. convention will be held, as we want to attend sure this winter.

Hornellsville, N. Y. THE PRESTON BRICK CO.

Notes From Tide Water, Va.

Editor Clay-Worker:

The dull season is on, and many of the yards have shut down with overstock of brick on hand. Prices are down very low, and the brickmakers feel a little blue. Quite a number of them say: "Well, if McKinley is elected, we will sell our brick at a profit."

The Suffolk Clay Co. are in the market for a dryer. They have a Sharer dryer of 25,000 daily guaranteed capacity, from which they are only getting 10,000 per day, and these are so badly cracked and blistered that they are hardly fit to put in the kiln. They want a dryer to dry 25,000 per day.

During the dull brick season the Nansemond Clay Co. and the Suffolk Clay Co. are making drain tile.

In going over the brick market a few days ago I found some of the river yards were delivering brick in Norfolk for $5.50 to $5.70 per thousand, and the manager of one of these plants, who is from Ohio, told me when he was here looking for a site that he would not make brick for less than $8 on vessels at yard, and now has cut prices to $5.50 to $5.70 delivered, with $1.25 freight. The Suffolk Clay Co. have shut down on brick, with one million in stock, and are holding them at $6 f. o. b. plant, and will stay shut down until they can get their price. "Better do nothing than work for nothing."

I am trying now to organize a brickmakers' union or association to establish a uniform price and size of brick for Tidewater, Va. If the brick manufacturers could get together and form an association, and put the price up and make a standard size brick (cut down the present size, which is almost equal to building block), then every brickmaker in this section would be benefited several thousand dollars, but they don't seem to realize or know it. They take a pride in cutting prices and selling their output for nearly cost. We only make so many brick a year, and they are all used. Why not get more for them. Oil, lumber, iron, and, in fact, everything, has advanced in price. Why not advance prices on brick?

The Suffolk Clay Co. have struck a forty-foot vein of very fine marl under their clay, and are thinking about going into the cement and fertilizer business. Cement and fertilizer machinery manufacturers might do well by corresponding with them.

The brickmakers of this section are very much elated over the fact that there is a prospect of the N. B. M. A. meeting at Old Point this winter. H. L. JACOBS.

Suffolk, Va., Sept. 18.

Escaped the Dreadful Storm.

T. A. Randall & Co.:

Gentlemen—Replying to yours of 13th inst., we are happy to state we escaped the awful storm that brought so much distress to Galveston, Tex., and vicinity. We have had good trade this season, with prices ranging from $5 to $6 per thousand at kiln. Texas is in good condition, has raised good crops of oats, wheat, cotton and fair crop of corn, and all the farm products are bringing good prices. The future of this section is exceedingly bright. We send you under separate cover Galveston paper, which will give you some idea of the storm. With our best wishes we remain, yours very truly,

Dallas, Texas, Sept. 17. J. M. HARRY & CO.

Down in Jersey.

Editor Clay-Worker:

As I commence this letter the rain is coming down steadily, and for the past week we Jerseyites have had more rain than during the balance of the season previous.

No doubt this will wind up the outdoor brickyards, of which there are acres in this region.

Perhaps it will be all for the best, as prices need toning up somewhat. From $3.50 to $4.50 at the yards is certainly not too much for so many pounds of clay done up in cubes.

Politics are warming up as November approaches, and most business men the writer has talked with seem to dread a change that it seems the American people desire every four years. Doubtless those who contemplate the expenditure of large sums for buildings would prefer to have these fourth-year elections extended at least two years, and it would be better if it were doubled.

Well, if one side can stand it, certainly the other should. We all desire the full dinner pail, I am sure.

From the outlook at Perth Amboy, the business men have no fear for the future. Building continues as brisk as ever.

The knee pants factory now being erected on New Brunswick avenue is going up nicely. This same firm are erecting some forty dwellings a few blocks further south, all of brick. This is really an advance in modern house building in Perth Amboy. Probably no city of its size in the West could compete with it in the number of frame houses. This has always been a mystery to the writer, for as a rule brick are cheaper here than in many sections, and any one who has paid any attention to the effect the climate has on paint will observe that about every three years paints should be renewed; if not, the wood decays fast.

It has been rumored that the C. Pardee brick plaint has been sold to a trust, but nothing definite can be obtained about the rumor. I wonder what a trust is in the brick line. Brickmakers, as a rule, go on in disregard of every other fellow, and bake their clay into various shapes irrespective of trusts or busts.

In speaking of the C. Pardee plant brings to mind the fact that during the summer Mr. Pardee has had erected upon lands adjoining the old tile works a large plant for the manufacture of shafting. This department has been in operation for some time. At the present writing the same firm are having erected a large steel building for a rolling mill to roll the steel for

shafting. A new railroad is being built from these works across the city to connect with the Lehigh Valley track, thus making one more quick outlet for the products, and also a chance to get coal in cheaper than heretofore.

We are glad to note this new undertaking upon Mr. Pardee's part, as he has stuck to the clay manufacturing plant through thick and thin.

Mr. Stacy Tuttle, of the Standard Fire Proofing Co., of this city, has returned home, after an absence of five months in Mexico.

Mr. Tuttle was sent out there by Robert Lyle and his associates to superintend the work on a plant in the suburbs of the City of Mexico. It is undecided, we understand, as yet whether Mr. Tuttle will return to Mexico. Doubtless the men employed there would like to have him back. Just before leaving for home a delegation of the employes presented him with a fine gold watch.

Perth Amboy's fire lines or limits are seriously in need of extension. Years ago, when the town was dead, a small fire district was laid out, but now that the city has taken on such a rapid growth, wooden buildings have sprung up all over the business portion and, therefore, make an extension absolutely necessary for the preservation of the welfare of the business center. What folly it is to build wooden buildings at any time, but more especially in the heart of a thriving city. Some day when a gale is blowing from the bay and a shortage of water is found in the supply pipes, a fire will get a start, and the result will be a clean-up of the whole section, together with the good buildings now on the streets.

The Raritan Traction Co. are now extending their tracks to Keasby and Metuchen. This will give vent to the overcrowded condition in Amboy, and also be of much benefit to the intermediate country.

It is simply astounding to see the results accomplished by the Raritan Copper Refining Co. on the old Watson Co.'s property. Where once stood the old fire brick works an immense brick structure, or, rather, many of them, now stand, covering many acres of land.

It would be a satisfaction to know exactly how many brick were used in the construction of these works. Certainly millions. The Raritan Traction Co., contrary to most companies after a charter is granted, absolutely live up to every detail of the requirements of their franchise, and for this reason we hope to see a wonderful extension of the building lines along this company's tracks.

At Keasby's works everything is being shipped as fast as possible. The old department formerly devoted to the manufacture of fancy brick is now devoted to the manufacture of fire brick. All the hill section above these works has been surveyed and laid out in streets and building lots, and placed upon the market. As there is too much striping on top of the clays underlying this part of the property it was concluded to place it upon the market. A beautiful view of the Raritan valley can be obtained from this high ground, and no doubt it will sell readily.

At the Adam Weber Son's works, nearby, we notice four new down-draft kilns, with another new stack, built of the round, hollow brick, which this firm have obtained the right to make in this country.

At the M. D. Valentine Bros. Co.'s plant, at Woodbridge, we notice two more of those steel-shell kilns spoken of in these letters from time to time.

They are also laying foundation for an extensive dryer, it being necessary to drive piling for the building to stand upon. As the old works were erected just at the edge of the salt meadows, the gradual extension of the plant has gone seaward, and, of course, the only method to make a foundation is to drive long poles into the soft, oozy ground. A heavy demand for this firm's make of fire brick is the cause of the increased facilities.

Mr. Charles S. Edgar, the clay miner, and Mrs. Edgar returned from Europe recently. While Mr. Edgar thinks Europe is a big country, yet "none of it can compare with America."

Mr. Edgar was out for the nomination of State Senator at the recent primaries, but, after 37 ballots were taken at the county convention, he withdrew his name in order to allow a choice.

We remarked to him yesterday "that there was no use in an honest man going up against the politicians, as he would get left every time."

It still rains. W. R. O.

A Busy Brickmaker.

Editor Clay-Worker:

Yours of recent date is received, and in reply will say, Dixon is the county seat of Lee county, of about 12,000 inhabitants, located on Rock river and the crossing of the Illinois Central and Northwestern railroads. Dixon has the Northern Illinois Normal School, Stineman Institute, a large condensed milk factory, wire screen factory, two large shoe factories, a plow factory, and will soon have a new court house, and last, but not least, a brick and tile factory, which employs twelve hands, and yet cannot make half the brick demanded. The brick plant has a 80-horse-power boiler, 50-horse-power engine, a No. 1 combined brick and tile mill, a six-track dryer, all furnished by E. M. Freese & Co., of Galion, Ohio, which runs as well as could be asked. Have not had one break-down all summer. There are two Eudaly down-draft kilns and one clamp kiln. Will run as long as we can dig clay.

Brick sell here from $6 to $7 per thousand. Wishing The Clay-Worker success, I am, sincerely,

C. W. NORTHRUP.

A Good Point to Locate a Brick Plant.

Editor Clay-Worker:

By Northern Pacific Express I send you to-day samples of a clay found on my land at La Camas, Clarke county, in this State, about one-half mile from the Columbia river and fifteen miles from Portland, Ore. The clay is exposed on the sides and bottom of a ravine, and appears to be of vast extent. It is easily accessible, with plenty of water and wood. A lovely home could be made here, with a magnificent view of the river and mountains. I would like to rent or sell this clay bed, and will be very glad if you will call the attention of your readers to its merits. Am told that vitrified brick for street paving, etc., can be made from it, also that fire clay and a fine white clay are found here also.

Not being posted in matters of this kind, I am quite at a loss as to how to proceed, but have been advised by prominent brick men here to lay the matter before you, asking you to kindly notice it in your paper and invite the fullest investigation by any one wishing to come to our State and build up a paying business. MRS. J. W. MIDDLETON.

Olympia, Wash.

DETROIT BRICK NEWS.

THE SEASON just closed has been an exceedingly good one for the manufacturers, so far as the weather was concerned. Few days, indeed, during the whole season has any plant in this vicinity been suffered to remain idle on account of inclement weather.

Mr. Andrew Lonyo, who purchased one of Greusel Bros.' plants, has bought additional property adjoining it, and added to his kiln shed, which places it among the largest in this locality. It has a storing capacity of about 5,000,000 brick.

Another young firm of Detroit brickmakers, who have been very successful is that of Proctor Bros., comprising Wm. H. and Otis M. Beginning on a modest scale, but by energy and enterprise their plant has developed into a large and well-regulated concern.

Rumor has it that George H. Clippert, of Clippert & Bro., is being urged to make the run for supervisor, but as yet is undecided. Should he conclude to make the attempt, indications point to an election by a handsome majority.

The Wolf Brick Company, which has had an improved dryer erected on their plant, has the honor of having the first dryer in successful operation in Detroit. Next season will see several other plants likewise equipped, now that the ice is broken.

Wolf Bros., whose plant is located at Wyandotte, Mich., although a firm of young men, and this their first good running season, report that they have enjoyed splendid business, and despite a large demand, they have succeeded in laying in a supply which they hope will carry them through the winter season.

Mr. Horace G. Smith, who some years ago was extensively engaged in brickmaking, being at one time connected with the R. H. Hall Brick Company, but since retiring from that firm, has not been engaged in that pursuit. It is understood that Mr. Smith is anxious to re-enter the field of brickmaking, and if a suitable locality can be found will establish a plant where he will make brick of every description, also tile.

Mr. Jacob Daniel, whose plant has almost reached the limit of its supply of clay, will be forced in the near future to locate elsewhere. It is said he will try to negotiate with Greusel

Bros., with a view to renting their concern. Mr. Daniel is a son of the late Jacob Daniel, who was one of Detroit's old brickmakers and who for several years was in partnership with Conrad Clippert. Mr. Daniel, though still a young man, has made rapid strides in brickmaking, and his plant is considered one of the stanchest in Detroit.

A visit to the brick and tilemaking plant of John C. McDonald & Son discloses the fact that their kiln shed is nearly filled, and it is hoped when the green brick are set the shed will be completely filled. They will then have a huge supply of brick of all descriptions on hand for the winter market. In McDonald & Son's plant Detroit has her only tile manufactory, and the output of this plant must supply the whole city's demand, and which it succeeds in doing. They manufacture tile in all sizes, from 2 inches to 24 inches. The demand for tile on this firm is necessarily large, yet their output is sufficient to supply this demand and enable them to place in stock enough to care for winter orders.

Michael Downey, a son-in-law of the late Francis Hyns, has had the plant of the latter in full operation the past season. Under the supervision of Mr. Downey the old plant, which is now a landmark in this vicinity, has turned out the same quality good brick, well made and well burned, for which it had long been noted under the direction of Mr. Hyns. Mr. Downey by occupation is a locomotive engineer, though it is a foregone conclusion that he is entirely familiar with all the affairs and details of brickmaking. During the season not only has Mr. Downey made excellent brick, but enjoyed excellent sales as well, and fall finds him with a good supply of orders on hand to be filled and a shed well stocked. Mr. Downey has the best wishes of his brother manufacturers and the public in general for a successful enterprise.

Stephen Pratt, one of Detroit's foremost boiler manufacturers, has added, along with his other enterprises, that of brickmaking. Early in the spring he secured the plant formerly operated by A. H. Schmittdeil. After giving it thorough inspection, he ordered needed repairs and other minor improvements, and immediately began manufacturing on a large scale. By several it was believed his enterprise would prove futile, but those who prophesied misfortune are forced to acknowledge fortune. Mr. Pratt has been very successful in his new enterprise; he has turned out good, uniform brick, and burned them well. He has enjoyed a big demand and in large quantities, and with sufficient orders on hand to keep him busy until late in the fall. Chances are that the opening of the season will find him with but a limited supply left over. Mr. Pratt, we congratulate you and trust that in the field of brick manufacturing you will be rewarded with the same success that mark your other enterprises.

A large stock on hand for fall and winter markets, is reported by nearly all the brick manufacturers in this vicinity.

It is safe in saying that prices will remain about the same as at present for some time: Common, $5.00 per thousand; pallet, $5.50; sewer, $5.50, and stock, $6.00.

All told, at the close of the season there were about 50,000,000 brick on the market for the fall and winter buyers.

Brickmakers are getting ready to handle the promised big rush of fall buyers. Architects report that the demand will be very heavy.

All the plants in this vicinity have closed for the season, nearly all have their sheds fairly well stocked for fall trade.

We are glad to know that Mr. I. L. Greusel, of Greusel Bros., who has been indisposed, is able to be about again.

At present there is a large demand for common building brick; nearly all the manufacturers have many orders for such, ranging from 25,000 to 35,000.

Mr. Lorenzo D. Haggerty, one of Detroit's old brickmakers, has the distinction of being one of the members that comprise the first Board of Public Works in Springwells.

Mr. Louis Lonyo, of Lonyo Bros., was made happy last week —not by an order for a large amount of brick, but by the arrival of a new baby; it's a girl. J. G. G.

Good Times in Georgia.

T. A. Randall & Co.:

Gentlemen—Herewith you will find check to pay for the coming year's subscription to The Clay-Worker. I am a small brickmaker in central Georgia, and made about three million of merchantable brick this season, find ready sale for them and manage to make a living out of it. I could not manage to get along without The Clay-Worker. I am going to put in some new machinery this winter, and when work is completed will send you photographs of my plant, with a brief description of how we manage our clay. Wishing The Clay-Worker lots of success and endless life, I am your friend.

W. A. ROBERTS.

OFFICIAL ANNOUNCEMENT.

The Fifteenth Annual Convention of the National Brick Manufacturers' Association to be Held at Old Point Comfort, Va.

AT OUR LAST annual meeting invitations were received from several cities in the Middle West, each setting forth its advantages and urging that it be selected as our next meeting place. At the time, in lobby talks, a number of our Eastern members suggested the advisability of our selecting some Eastern city, calling attention to the fact that we had not met in the East since the convention at Washington in 1892. Others from the South suggested that if we could meet at some point where the cold would be less intense there would be a larger attendance from the South.

We are pleased to be able to gratify both of these factions by arranging for our next annual meeting at Old Point Comfort, Va., early in February, 1901. Situated midway on the Atlantic coast, Old Point may be reached in a few hours from any of the Eastern or Northern points. It is equally accessible from Southern territory, and being a delightful winter resort, it will afford those accustomed to mild weather a pleasant and safe harbor, while its many other attractions, not the least of which is Hampton Roads, a broad and beautiful expanse of sea formed by the confluence of Chesapeake bay, the James river and the Atlantic, where the Nation's greatest naval fleets are wont to gather, make it equally attractive to those from the Central and Western sections.

The facilities for convention work are unexcelled. Hotel Chamberlain, which will be headquarters, is noted for its excellent equipment and splendid service, and will afford every convenience necessary for the entertainment and comfort of our entire membership. A special rate will be made to all delegates and their families. Those who may want to stay longer than the week of the convention will be granted the same rate so long as they remain there.

In due time the usual arrangements for reduced railroad rates will be made, and we hope, also, to provide for stop-over at Washington, D. C., so that those who wish to do so may visit the national capital on their way to or from the convention. The splendid steamships plying between Old Point and Washington run the year around, as do also the boats to Baltimore and Atlantic coast points.

Already inquiries are being made relative to time and place for our next convention, which indicate widespread interest. Evidently, the attendance will be fully up to that of recent years, if not greater. The programme will be announced in good time. Clayworkers who are not now members, but who wish to join the association, and attend the meeting at Old Point Comfort, are requested to write to the secretary at Indianapolis for further particulars.

THE EXECUTIVE COMMITTEE.
W. D. GATES, President.
THEO. A. RANDALL, Secretary.

Fire fighting apparatus, and fire brigades composed of employes, must be kept in good working order if they are expected to do efficient service when called on in earnest. There must be no guesswork as to the condition of pumps and hose, nor as to whether each member of the brigade knows exactly what he is to do in case of fire. Just as well trust to luck as to inefficient fire service.—Exchange.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SEVENTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIV. OCTOBER, 1900. No. 4.

CURRENT COMMENT.

The announcement of the selection of Old Point Comfort, Va., as the next meeting place for the N. B. M. A. seems in the nature of glad tidings to many of the members. Some who have not attended the conventions for some years past have expressed their intention to go to Old Point Comfort convention time.

* * *

Old Point is indeed a delightful winter resort, and affords unrivaled opportunities for rest and recreation. Few places are of such great historical interest. Who of us has not read over and over the battle of the Monitor and the Merrimac, and longed to visit the scene of that memorable contest. Those who attend the convention will be able to gratify that desire, and to inspect the modern warships, compared with which the Monitor and the Merrimac are mere toys.

* * *

Fortress Monroe, within almost a stone's throw of Hotel Chamberlain, is of itself worth the trip to Old Point. Here the boys in blue, the defenders of the Nation, are drilled and educated in the arts of war. The daily guard mounts and dress parades, with the brass band accompaniments, all under the fluttering folds of "Old Glory," afford amusement gratifying to old and young alike. There are many other points of interest near by, of which we shall speak later. Those who consider a brickyard pilgrimage a necessary incident to a convention trip will find abundant pleasure of that sort, as there are a number of brickyards in that vicinity.

* * *

Our esteemed townsman, Frank W. Butterworth, for years manager of the Marion Brick Works, has severed his connection with that company, and is making arrangements to establish a modern building brick plant near Danville, Ill. The new brick company will be known as the Western Brick Co., and the works will be equipped with both stiff clay and soft clay machinery. "Frank" says they have a fine body of shale, and may in time manufacture paving brick, as well as builders. His connection with the enterprise is a guarantee of its success. His old company and associates regret his departure and wish him all sorts of good luck. He is succeeded as manager of the Marion Brick Works by the treasurer, A. W. Penny, of Chicago.

* * *

A new method of fireproofing wood, of English origin, is said to be so effective that a box made of wood so treated, though subjected to a very hot pitch pine fire for twenty-three minutes, preserved documents unscorched, though the outside of the box was charred. Very good, but why not make the box of burned clay? Terra cotta is absolutely fireproof.

* * *

This month's leading article, entitled "A Brick, Brick Plant," is interesting and suggestive at least. Brickmakers who are wont to grumble at high insurance rates will find in it the key to relief. Use your own noncombustible material. Build your buildings of brick, roof them with clay shingles or tile, and you will have no trouble to get good insurance at reasonable rates.

* * *

In this connection the thought suggests itself, why cannot some method be devised that will permit the use of tile for kiln shed covering. The commonest kind of tiling, such as Germans use on their outbuildings, might be utilized, it seems to us, for such use. Tile like the Ludowici that are not nailed down, but hung on cleats in a manner to be easily removed or replaced at will, might be used to great advantage in this way, if some practical means are devised for supporting them. If they could be handled a half dozen, or a dozen at a time, they would prove a factor of safety.

* * *

Those who keep tab on mechanical inventions and note the wonders accomplished in the various arts and industries say there is no telling what may not be accomplished by the inventive genius. Things that yesterday seemed impossible are accomplished facts to-day, and superseded by something even better to-morrow, so it may not be so visionary to contemplate the erection of brick and tile plants constructed so largely of their own products as to be fireproof and indestructible so far as the elements are concerned. Clayworkers should contrive methods of using burned clay in all manner of ways, and so multiply their own possibilities.

* * *

Henry Ames, of Litchfield, Minn., president of the Northwestern Brick Manufacturers' Association, is making a tour of the clayworking machinery plants of Indiana and Ohio. He contemplates putting new stiff clay brick machinery in his plant, which at present has a capacity of 3,500,000 bricks per annum. He called at The Clay-Worker sanctum, renewed his subscription, and reported a very satisfactory trade situation in his section. More brick are being used there than ever before, and there is but little doubt but that the situation will be even better next year. The brickmakers of Central Minnesota have no combination or association, but they are on friendly terms, as a rule, and the business is conducted on lines that admit of a fair profit. This is as it should be.

WOODEN BLOCK PAVEMENTS AN EXPENSIVE LUXURY

Wooden block pavements, when new, are in some respects the most desirable of pavements, but their wearing qualities are so poor that they are at best an expensive luxury. Speaking of one of the best wooden pavements in Indianapolis, a local paper says:

How about the wooden pavement of North Meridian street? The guarantee period is soon to expire. The pavement is in a wretched state. There is not a square rod of it in which there are not blocks that ought to be removed and replaced with new ones. In many places several contiguous blocks are decayed, making bad holes. Is not the pavement to be put in repair before the guarantee expires? If the contractors are not responsible for the work, the pavement in any event should be overhauled. The longer it is left uncared for, the greater the expense in the end, and the shorter the life of the pave-

ment. It is only five years since the pavement was laid, and already the street is in almost as bad a condition as it was before.

The street referred to is one of our finest resident thoroughfares. The residents can afford to have what they want, but as we have stated, they are finding wooden block pavements an expensive luxury.

MORE PROSPERITY AT GALESBURG.

While at Galesburg recently it was our pleasure to visit the new plant of the Frost Engine Co., with its able and genial manager, Andrew Harrington. The works are nearing completion, and when finished will give them facilities second to no engine and boiler factory in the United States. The buildings are all of brick, Galesburg pavers, and roofed with Ludowici tile, thus being fireproof, are spacious and well lighted, and will be equipped with every modern convenience for carrying on the work. No expense of capital or labor has been spared in planning and equipping the various buildings which cover several acres. In due time we will give a detailed description of the works, with a series of illustrations. Those who want up-to-date engines and boilers, they manufacture dry pans, too (see page 326), will do well to investigate the merits of their products. They esteem it a pleasure to quote prices to any readers of The Clay-Worker, for they know from past experiences that when our readers ask for prices they mean business.

TRANSACTIONS OF THE AMERICAN CERAMIC SOCIETY

A Correction.

In our review of Volume II of the Transactions of the American Ceramic Society we erred in naming the price as $1. In calling our attention to the item, Prof. Orton writes:

"It happens that we have given you good cause for making that error in the book itself. The price was first agreed upon at $1 per volume. Later, when the Manual was brought out, the committee revised the price, charging $1 for the Manual and $2 for Volume II (all of these prices, of course, are for members). For those not members, the price is $4 for the Transactions. I am already receiving $1 from parties who expect to buy the book for $1, on account of the article appearing in The Clay-Worker, so please make correction, stating that the price of Transactions is $4 to people not members of the Society. The price of the Manual of Ceramic Calculations is $1 to members and non-members alike. To members of the society, Vol. II is priced at $2 and Vol. I at 50 cents. An explicit statement of this kind coming from you will do a great deal to set the matter straight."

Our readers will please take due notice and govern themselves accordingly. The publications of the American Ceramic Society are well worth many times the price put on them to any ceramist. The volumes can be obtained from Prof. Edward Orton, Jr., Department of Ceramics, Ohio State University, Columbus, Ohio.

PHILADELPHIA PAVEMENTS AND PAVING BLOCKS.

The writer spent a profitable and pleasant twenty minutes last week conversing with Mr. Frank McAvoy, the genial and well-known brick manufacturer. Touching upon the subject of brick pavements, he said that Philadelphia work had greatly improved in the last two years, and that this was due to better inspection on the part of the city, which compelled the contractor to do better work. The main trouble with brick pavements in this city in the past has been the lack of proper foundations under the brick surface and lack of grout filler between the bricks. The best brick made will not stand up on a poor foundation. All of which is good common sense.

He thinks the cities of the Middle West have the best brick pavements in the country, though some of the paving laid in Norristown a year or so ago will compare favorably with any in existence.

The McAvoy Co. have just completed the installation of a vitrified block making machine at their Perkiomen Junction plant, and expect to be turning out high-grade vitrified shale blocks this week.

Mr. McAvoy stated that he has always contended that the superior showing of blocks as compared with bricks, in the abrasion tests, such as you published last month, was misleading, as the 7-inch iron rattler bricks used in such tests naturally make more impression on the bricks than they do on the large blocks. This is sound logic, and as a matter of fact, in actual service on the streets, the iron-shod horses' hoofs and wagon tires abuse the blocks less than the bricks, and the block is gradually becoming recognized as the better article for street pavements. This subject was discussed by the writer in the last issue of The Clay-Worker in the article on "Philadelphia Brick Pavements. I hope to present some views of Norristown pavements and also some of a model brick and blockmaking plant in the near future.

HARRISON SOUDER, C. E.

TRADE LITERATURE.

"WHAT! ONLY 27 REVOLUTIONS?" is the startling title of a very neat little catalogue received from F. L. Smidth & Co., of Copenhagen. The interrogation relates to the tube mills and grinding machinery which they are offering clayworkers and cement manufacturers, and for which great efficiency is claimed. In addition to the illustrations of the grinding mills, the book contains much information of special interest to ceramists. Our American readers desiring a copy are requested to address the company at 66 Maiden Lane, New York City.

THE AMERICAN BLOWER CO., Detroit, Mich., have favored us with a copy of their new catalogue, No. 117. It is a handsome book of 60 pages. The cover is a rich dark green paper, and the title is embossed in gold on a black background, giving a very rich effect. The book contains a large number of handsome engravings of brick, tile and lumber dryers erected by the American Blower Co. at different places in the United States, and a number of foreign points, as well. The descriptive matter is both interesting and instructive, and there are also a large number of illustrations of fans and blowers and other apparatus for heating and ventilating purposes. A copy of the catalogue can be had for the asking.

"STREET PAVEMENTS AND PAVING MATERIALS" is the title of a new work by George W. Tillson, C. E., published by John Wiley & Sons, New York City. It is a manual of city pavements and the methods and materials of their construction for the use of students, engineers and city officials. It is an 8vo. of 532 pages, and contains 60 illustrations. Price in cloth cover, $4.00. Mr. Tillson is known to our readers as the author of the series of papers recently published in this paper under the title of "Brick Pavements in Greater New York." He has made a study of pavements and paving materials for years past, and as he is an engineer of note, the work will doubtless become a text-book. Those of our readers desiring a copy are requested to order same through The Clay-Worker.

ELECTRIC POWER FOR OPERATING BRICKYARDS.

One of the interesting features in Mr. Durant's able article, entitled, "Southern California Brickmaking and Brickmakers," in this issue, is the reference to the use of electricity as a motive power for brick works. This is a matter of much importance to clayworkers who are located within reach of cheap electrical power. Brickmakers in the Niagara belt and similar electric zones may well investigate the economy and efficiency of this new power. Where it can be had at a reasonable price it seems to be an ideal power.

PRETTY FAIR WORLD, AFTER ALL.

With eyes of many colors, many hues,
We look at things and all get different views;
But when we meet and view with view compare,
Why, bless your hearts, all things look pretty fair.
Indeed they do,
Despite what some declare;
For it is true
That things look pretty fair.

We speak in many tongues these latter days.
And find more faults to blame than good to praise;
But when the speech is done to the last letter,
Each one admits this world is getting better.
Indeed they do,
Despite of faults that fetter;
For it is true
This world is getting better.

Even the ones that wore the narrow face,
And said that we were heading for some place,
Now hug a thought, a haunting, shadowy shape,
Half fear, half hope, that we may yet escape.
Indeed they do,
That by scratch and scrape
We might pull through,
And barely escape.

O! it is good to live these latter days—
So good we just would like to live always;
For we are getting better everywhere
And all around us things look pretty fair.
Indeed they do,
Despite what some declare;
For it is true
That things are pretty fair. —Galveston News.

BLOW YOUR OWN TRUMPET.

Blow your own trumpet, but do it discreetly,
Don't make a noise that is sure to offend;
Sing your own praises, but manage it neatly,
Try to make every hearer a friend.
Don't be bombastic, for people don't like it,
Don't be importunate—that will disgust.
When the iron is hot is the time you should strike it,
Strike it when cold, it will yield you but rust!

Blow your own trumpet, be modest about it,
Others have trumpets to blow just as well;
Here's a little advice, and you can not well doubt it—
The loudest of horns does not always excel.
Blow, but blow easy, the music is sweetest
That falls on the ear with gentle refrain.
Melody always is thought the completest
When soft and low, and without any strain.

Blow your own trumpet—but not to drown others;
Don't be discordant—"ahead of the band."
Remember that even in business we're brothers,
All are entitled to "blows," understand,
Keep in the lead if you like, recollecting
Others have places to fill just the same.
Do not be selfish and always expecting
You are the only one striving for fame.

Blow your own trumpet, but don't blow too loudly,
You will be heard by sufficient, I guess;
Experience shows that those acting too proudly
Often are humbled and meet with distress.
Don't be too blatant or too self-asserting,
The reason is in this old axiom found—
A maxim that only false pride can be hurting:
"'Tis the emptiest vessel that makes the most sound."
—John S. Grey.

TRADE NOTES.

The Morrison-Trammell Brick Co., Rome, Ga., are in the market for one hundred single or double-deck dryer cars. They prefer to purchase second-hand cars if in good condition.

W. D. Richardson, the worthy ex-president of the N. B. M. A. has severed his connection with the Ohio Mining and Manufacturing Co., of Shawnee, Ohio, his resignation to take effect October 31, and is now looking about for a desirable location for a press brick plant, having it in mind to establish a modern brick plant if a suitable opportunity presents itself. Mr. Richardson's known ability is a guarantee of the success of any plant with which he may identify himself.

C. & A. Potts & Co., Indianapolis, report a very satisfactory trade. Their output so far this year exceeds that of any former season. Among recent orders booked is one for a complete brickyard outfit, including a Potts stock brick machine, mold sander, disintegrator, trucks, molds, etc., for the Cliffwood Brick Co., Cliffwood, N. J. The equipment is for a new plant to be erected near their old yard. This will increase their daily capacity 40,000.

TABLE OF CONTENTS.

A Brick, Brick Plant 263
The Trusts and the Small Brick Factories 265
Brickmaking in Colonial Days 266
Vitrified Brick Pavements in Philadelphia 266
Fire Brick: Their Manufacture and Uses 268
Chimneys and Riddle-Bottom Kilns 270
Southern California Brickmaking and Brickmakers 271
Terra Cotta in Architecture 274
Button-Hole Talks 275
Giant Dry Press Brick 275
A Clayworker's Observations in Havana 276
Clay Products in the National Museum 277
A Contented Brickmaker 278
In Philadelphia Brickyards 279
Clayworking in Denmark 281
Watch that Burner 282
About Clay Building Materials 283
A Successful Chicago Brickmaker 283
A Hand Power Brick Press 284
By the Light of the Kiln Fire 285
The Koalins and Fire Clays in Europe 291
Valuable Material for Potters, Sewer Pipe Manufacturers, etc 292
Official Announcement 296

CORRESPONDENCE.

Buffalo Brick News 284
Capital Brick and Building News 290
A Rational Method of Burning 293
Good Roads—The Wheel Track Project 293
A Query 293
The Chicago Brick and Building Situation 293
Good Business and Good Resolutions 294
Notes From Tide Water, Va 294
Escaped the Dreadful Storm 294
Down in Jersey 294
A Busy Brickmaker 295
A Good Point to Locate a Brick Plant 295
Detroit Brick News 295
Good Times in Georgia 296
In and About Pittsburg 304
The New York Brick Market 306
Pacific Coast News 308
St. Louis Notes 309

EDITORIAL:

Current Comment 297
Wooden Block Pavements an Expensive Luxury 297
More Prosperity at Galesburg 298
Transactions of the American Ceramic Society 298
Philadelphia Pavements and Paving Blocks 298
Trade Literature 298
Electric Power for Operating Brickyards 298
Trade Notes 299
Editorial Notes and Clippings. 302

MISCELLANY:

The Season 265
First in the Field 280
Calorific Value of Petroleum Products 284
Your Vacation 292
Pretty Fair World, After All 299
Blow Your Own Trumpet 299
A Kick Against the Summer Girl 304
His Mark 308

Index to Advertisements on Front Inside Cover Page.

Will Use Our Filter.

The Westinghouse Air Brake Co. have just ordered a large filter to equip their power house. This filter will clean the waste oil for the new steam turbine, which they use.

One by one the large concerns the World over are recognizing the ever evident superiority of

The Cross Oil Filter.

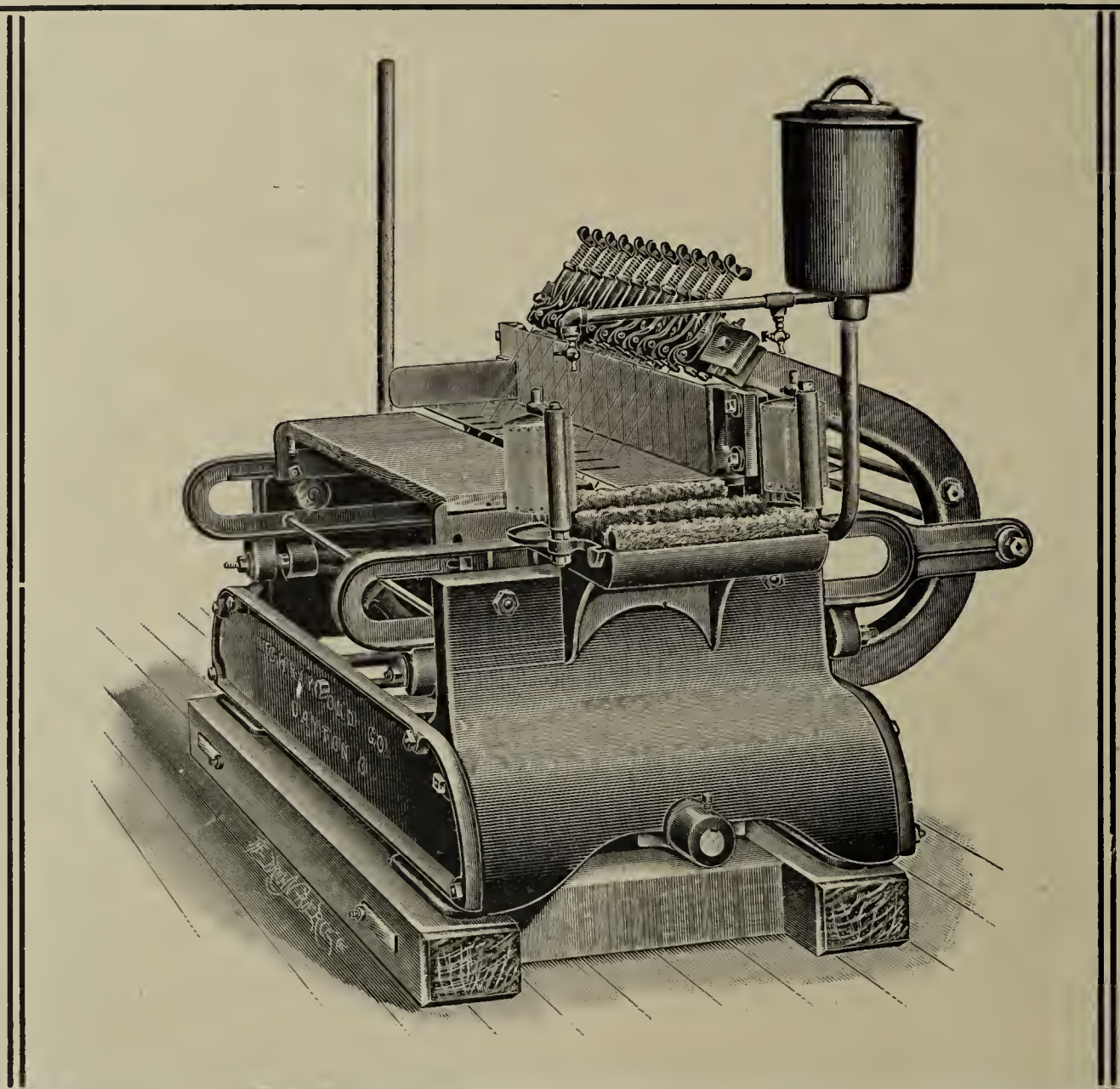
The Cross Filter will save half your oil bills. We send on approval at our expense.

The Burt Manufacturing Co.,
Akron, Ohio, U. S. A.

Largest manufacturers of Oil Filters in the World.

We also manufacture the BURT EXHAUST HEAD.

The RAYMOND Down Cut Board Delivery CUTTING TABLE.



Our Line of Stiff Mud Machinery

Is in use throughout the civilized world in hundreds of the largest yards, giving the best of satisfaction to its users. This universal recognition of its merits is the highest encomium that can be offered. Its design is the result of twenty-five years of hard study and experience, and into its construction enters nothing but the best of materials and workmanship. You make no mistake in using a **Raymond Auger Machine.**

Our Line of Soft Mud Machinery

Is no experiment and is daily winning its way into the favor of the progressive brickmakers. We are selling large quantities of them and each and every one, as it is placed in position, is doing more than we promise. **The Raymond No. 1 Horizontal Stock Brick Machine** occupies the highest pinnacle of success in Soft Mud Machine construction.

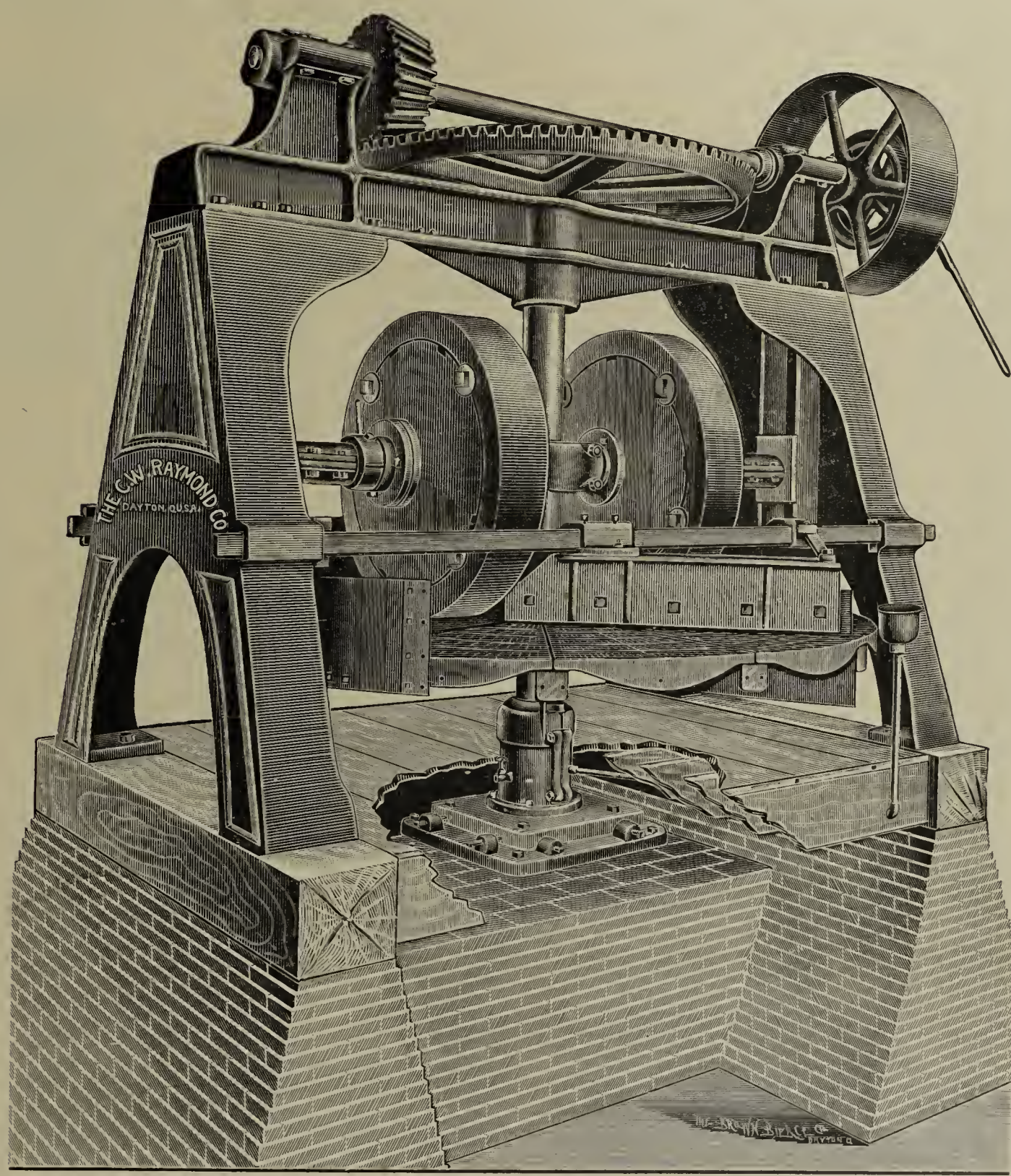
The C. W. RAYMOND COMPANY,

Send for our New Catalogue. *Dayton, Ohio, U. S. A.*

Do You Realize the Advantage

Of weight, solidity and strength.
Of the absence of all springs and pieces of light and trivial construction.
Of large and substantial gearing so arranged that it cannot get out of line,
Of muller rims so attached that they will not work off,
Of mullers with renewable hubs, all lathe turned and centered so they run absolutely true,
Of a step that will not heat or show undue wear, and which is absolutely dust proof,

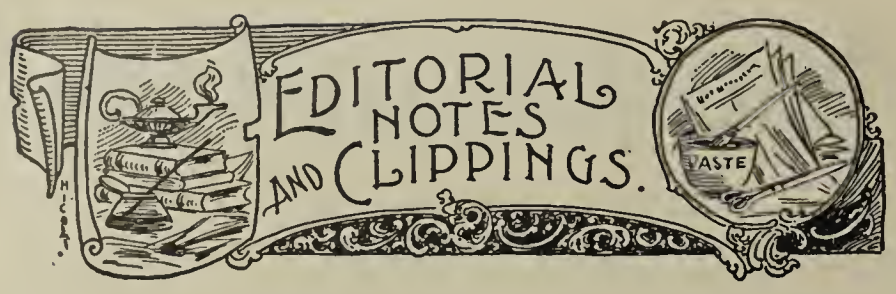
IN A DRY PAN?



RAYMOND IRON FRAME DRY PAN.

If you do, drop us a line and we will tell you all about one that possesses, not only these, but a hundred other valuable points, that you cannot afford to be without.

The C. W. RAYMOND CO., Dayton, Ohio, U. S. A.



Aitkin, Minn., wants a brickyard.

R. W. Gambill has opened a new yard at Kingston, Tenn.

Andrew J. Ward will establish a new brick plant at Flint, Mich.

Hart's Brickyard, at Weir, Mass., was slightly damaged by fire recently.

The People's Manufacturing Co. has been granted a charter to manufacture brick at Salem, Va.

The Abingdon (Ill.) Clay and Tile Co. has changed its name to the Abingdon Paving Brick and Tile Co.

A. Clothier has started a new brickyard at Kemptville, Ont., where he will make face brick for the Ottawa market.

The W. D. Johnson Brick and Tile Co. have started a brick plant at Craig Hollow, a small suburb of Ft. Dodge, Iowa.

A company, of which C. C. Auld, of Washington, Pa., is manager, contemplates erecting a brick plant at Waco, Texas.

Patrick J. Dalton, a pioneer brick manufacturer of Western Pennsylvania, died at his home in Latrobe, Pa., September 30.

A new brick plant will be established at Strasburg, Va., by J. W. Eberly and others. They will manufacture vitrified paving brick.

John L. Toler, Anna, Ill., writes that he wishes to purchase a small second-hand or new glaze mill for either hand or horse power.

Joseph Kuhlman, an employe of the Merchants' brickyard, at Cleveland, Ohio, was quite seriously injured by a cave-in at the plant recently.

Jacob J. Bram, 120 Cator avenue, Jersey City, N. J., advises that he is in the market for some second-hand clay machinery and dry pans.

The Alexis (Ill.) Pottery, which was recently destroyed by fire, will be rebuilt in the very near future with a much larger capacity than before.

The Lincoln Brick and Tile Co. has been incorporated at Homestead, Pa., by O. Hodder, C. Hodder and C. C. Ziegler. Capital stock is $50,000.

The Westinghouse Air Brake Co. have just ordered from the Burt Manufacturing Co., of Akron, Ohio, a large Cross oil filter to equip their power house.

The Nashville (Tenn.) Brick Co. has been chartered by J. L. McFadden, J. H. Connor, J. R. Thompson and others. The capital stock is given as $25,000.

Jno. Houser has purchased R. W. Crofoot's interest in the Troy (Ohio) Brick and Tile Co., and from this on will be associated with Mr. Beedle in the business.

The American Brick and Tile Co.'s new plant at Mason City, Iowa, is finally ready for operation and a fine grade of brick will be turned out regularly now every day.

The Keller-Marquis Brick and Tile Co. have broken ground for their new plant at North Judson, Ind., and the work will be pushed to completion as rapidly as possible.

W. A. Neal, of the firm of Neal & Newell, of Pickens, S. C., has purchased the interest of his partner, A. T. Newell, and will hereafter operate the plant on his own account.

The Boulevard Brick Co. is the name of a new concern to be organized at Pittsburg, Pa. Reed B. Coyle, John Munhall, O. O. Page, J. H. Palmer and J. B. Murdoch, all of Pittsburg, are interested. It is now planned to have the plant in operation by the close of the year.

The Warden Cliff Brick and Tile Co. has been incorporated by William F. McNamara, Charles Kirwin and M. P. Davidson to manufacture brick and tile at Brookhaven, N. Y.

The Consolidated Ward Brick Co. is the name of a new concern organized at El Paso, Tex., by P. F. Edwards, B. F. Hammett and B. F. Darbyshire for the purpose of manufacturing brick.

The Sloan Clay and Development Co. has been incorporated to manufacture clay products at San Diego, Cal., with $500,000 capital stock. J. A. Flint, E. T. Blackmer and others are interested.

The Kewanee Mining and Manufacturing Co. has been incorporated to manufacture brick and ice at Kewanee, Ill. The incorporators are W. V. Eddy, F. H. Davis and A. C. Scott, all of Kewanee.

Lightning hit a kiln in the Glen Carbon brickyards, at Edwardsville, Ill., September 26, demolished the kiln and buried five men under tons of brick. Four were instantly killed and one was badly injured.

The Broadway Pottery, Harrisburg, Va., is running full-handed, and the employes are getting the best wages that have been paid in that section for some time, many of the men earning from $4 to $7 a day.

Syme, Baldwin & Co. have started a new yard at Glenwood, Wis. They have started in a small way, but expect to enlarge their capacity for next season, if their anticipations of a good fall and winter trade are realized.

The Amos Kent Brick and Lumber Co.'s plant, at Kentwood, La., was damaged to the extent of $4,500 by fire last month. The fire originated in the dryer. The company carried $2,000 insurance. The plant will be rebuilt.

The Shaw Enamel Brick Co. has been chartered at Dover, N. J., to operate at Wilmington, Del. The incorporators are P. A. Horty, H. T. Graham and J. F. Daley, all of Wilmington, and Mrs. Frances Shaw, of Chicago, Ill.

Evanston, Ill., is to have a large brick plant. Thirty-one acres of land have been purchased, and ground will be broken at once for the erection of a plant of 500,000 daily capacity. John B. La Bahn is the prime mover in the affair.

In a recent letter, renewing his subscription, F. L. Cook, of State Farm, Mass., says he has had a good season, and has made a number of improvements at his yard that will enable him to meet the steadily increasing demand for his product.

J. L. Higley, of Higley, Keplinger & Co., Canton, Ohio, says that the brick business in Canton is "humming." The brick plants are all running full handed to fill orders, and the prospects are that the close of the season will find the stock all cleaned up.

The works of the Soisson Fire Brick Co., at Moyer, Pa., was burned to the ground Sunday, September 30, entailing a loss of $12,000, partly covered by insurance. The plant will be rebuilt at once, and this time will be absolutely fire-proof, with a capacity of 50,000 brick per day.

Thomas Hanlon, of Washington, D. C., writes that he will be pleased to receive quotations for either new or second-hand brick and tile machinery for plants which he [illegible] to establish in the South. Parties interested can address [illegible] Hanlon, The Kenmore, 226 North Capitol avenue, N. W.

The Diamond Fire Brick Co., of Canon City, Colo., which was organized in February of this year, have their new plant almost completed, and expect to make their first brick now in a short time. The officers of the company are: President, E.

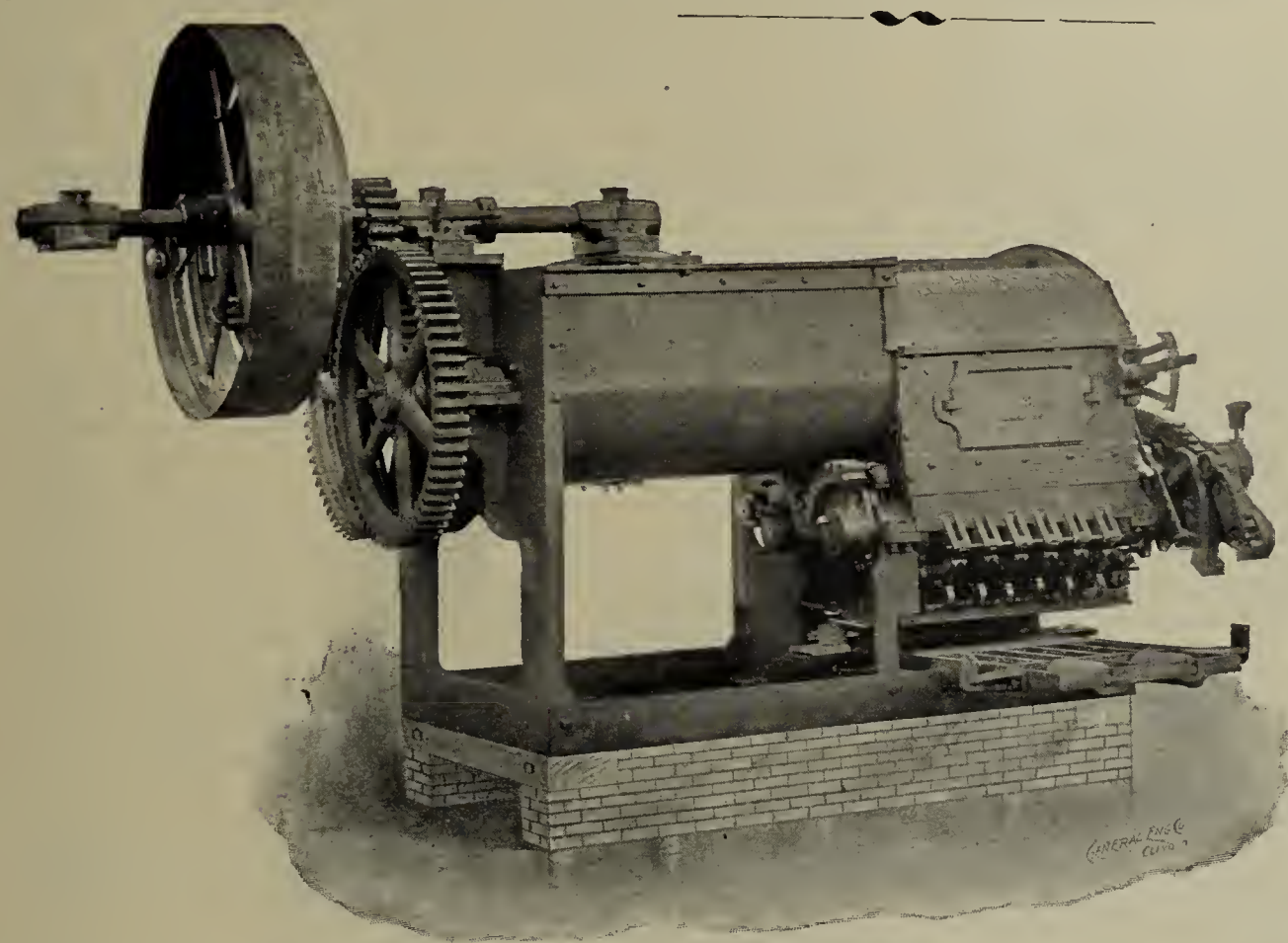
[CONTINUED ON PAGE 304.]

LIGHT HOUSES

Do not have to hire bands or fire cannon to call attention to their shining—**THEY JUST SHINE.**

Thus it is with the two "soft-mud" machines we manufacture (one horizontal and one upright). **Each** is at the head of its respective class, and the number of each in use, (note the figures)

TELLS THE WHOLE STORY.



Over 100 "Monarch" Brick Machines In use.

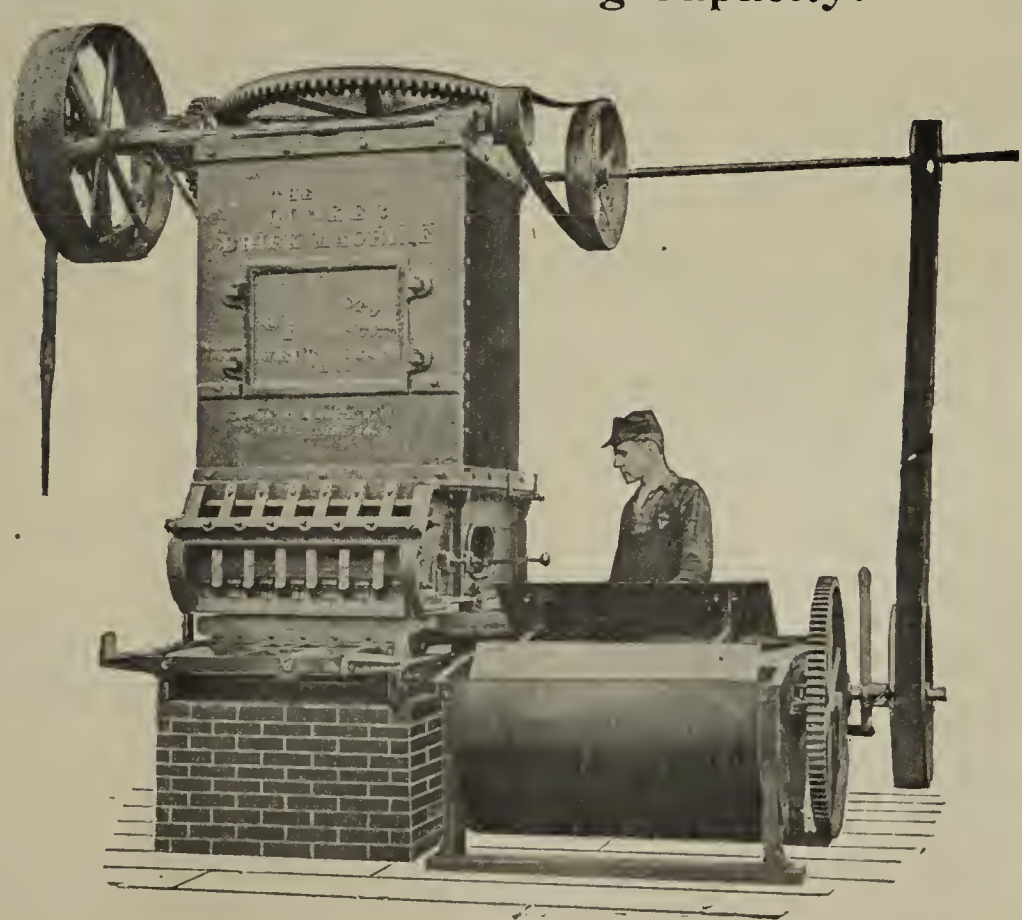
Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

Our mould-sander is the best, simplest and cheapest.

With our Roller-bearing Brick Barrows you can wheel 20 per cent. more load and do it as easily. Order one subject to approval.

ALL OTHER SUPPLIES. Send for Catalogue.



The Wellington Machine Co.,
WELLINGTON, OHIO.

EDITORIAL NOTES AND CLIPPINGS—Continued.

F. Jewett; vice-president and secretary, E. C. Hiatt, and treasurer, G. F. McRay. Mr. Jewett has had a great deal of experience in the handling of clay, and the other officers are gentlemen of good business sense, so there is no doubt as to the success of the enterprise.

The brick manufacturers of Sioux City, Iowa, have been experiencing an unusually busy season. All of the yards are working to their full capacity to fill rush orders. A big portion of the demand is local, due to a building spurt that is on now, but a goodly share of the orders come from outside towns.

The Drayton Brick Co. is the name of a new organization at Drayton, N. D. The officers are: President, H. W. Wallace; vice-president, H. W. Gilroy; secretary and treasurer, George A. McCrea, and manager, William Moore. The new company has bought the yard, including machinery, etc., of Moore & Storfield, and will enlarge same, greatly improving the facilities for brickmaking.

The new plant of the Montello Brick Co., at Wyomissing, Pa., is now completed, and has a daily capacity of 120,000 brick. It is equipped throughout with modern machinery and appliances, buildings are all fireproof, and the plant is one of the finest in the country. The company will operate the new plant, where they will manufacture building and sewer brick, in connection with their paving brick plant at Reading, Pa.

John T. McElroy, of the Brazil Brick and Pipe Co., whose plant is located at Brazil, Ind., has purchased the interest of Joseph V. Ayer and W. L. McCarel, and is now sole owner. A new office building has been built out at the plant, and the head office will be located there. The company is doing a big business on hollow brick at present, and the plant is working to its fullest capacity to fill the orders. The yards are at present filled with conduits, and none of this product is being made.

Peter Byrne, senior member of the brick manufacturing firm of Peter Byrne & Son, of Philadelphia, Pa., was stricken with heart disease while giving orders to an employe at the plant, and expired before a physician could be summoned. Mr. Byrne was born in Ireland sixty-one years ago. He began making brick in Philadelphia in 1866, and had been engaged in the business continuously ever since. He is survived by a wife, three daughters and one son, Frank, the latter being associated with him in the business.

Mr. Lewis Dietz was accidentally killed early this month at the clay pit of the Washington Hydraulic Press Brick Co., near Severn, about twenty-eight miles north of Washington, D. C. He was the superintendent there, where in blasting the clay dynamite was used The day of the accident a blast was fired and a large lump of the clay was hurled with such force against his head as to kill him instantly. Mr. Dietz was sixty years old, and leaves a wife and seven children, and had resided in or near Washington for forty years.

IN AND ABOUT PITTSBURG.

THE MOYER PLANT of the Scisson Fire Brick Company, located near Moyer, in Fayette county, Pennsylvania, three miles from Connellsville, was destroyed by fire on the night of Sept. 29. The entire loss, aggregating about $5,000, is covered by insurance. The plant had a number of rush orders on hand.

The Rumbaugh Brick Company, of Greensburg, Pa., has just been awarded a contract for 300,000 brick, to be furnished for a Pittsburg artificial gas company, which is represented by W. J. McClurg and which concern is erecting a big plant near Irwin, Pa.

The Hires Company, of Malvern, Pa., have just begun work on a brick and structural steel building, which will be used as a tin-can factory.

The school officials of Rankin borough have just awarded the contract for a brick school building, which is to cost $48,000.

The anthracite coal strike is slightly felt by the brick manufacturers of the Pittsburg district. The brickmakers of this district have been filling many orders for the eastern coal operators.

Among the modern office buildings projected for this city is a twenty-story one which will occupy the site at the corner of Market street and Fifth avenue. The new People's Saving Bank building, at the corner of Fourth avenue and Smithfield street, is nearing completion.

The new buildings to be erected by the American Ax and Tool Company, at Glassport, Pa., will carry with them several large brick contracts, which will likely go to some of the brick manufacturers of this district.

The new plant of the Steel Hoop Company, at Sharon, Pa., to be erected at once, will include a brick building 400x200 feet, and several additional buildings.

Wonderful developments are now going on in the Pennsylvania mountains above Ligonier, where the new Pittsburg, Westmoreland and Somerset road is now in operation. Among the late finds there is an almost inexhaustible vein of fire clay and a fine silica deposit. It is likely that extensive brick plants will be erected in those mountains soon.

The Wallaceton Fire Brick Company, operating an extensive plant at Wallaceton, Pa., has lately received a number of extensive contracts.

The Dunbar Fire Brick Company, of Dunbar, Pa., is supplying many large orders in the coke regions.

Sankey Bros., who operate extensive brick works in this city, are enjoying a big season in the brick trade. This company has obtained a reputation for turning out a fine product.

The Pittsburg and Buffalo Coal Co., one of the largest coal concerns in the Pittsburg district, outside of the two coal combines, has just made contracts for half a million dollars' worth of work, machinery and material, the contract being contingent on the election of McKinley. If he is not chosen President in November the contract becomes null and void, as the officials of the company believe that in that event they will not be able to keep their present plan in operation. This big contract includes a new sluice brick plant which the company proposes to erect at a silica mine up the Allegheny river. The Jeffrey Manufacturing Co., of Columbus, O., has received that part of the contract which relates to brickyard supplies.

The Marshall-McClintock Construction Co. will erect an immense plant for the manufacture of bridge and structural steel work at West Homestead.

The Pittsburg department of the American Clay Manufacturing Co., whose offices are located at 202 Ninth street, have lately filled a number of large contracts for vitrified and glazed brick and for sewer pipe.

The product of the Crown Fire Brick Co., whose plant is located at Akron, O., is finding its way into the markets of this district, a number of large contracts having been recently placed here. GILBERT.

A KICK AGAINST THE SUMMER GIRL.

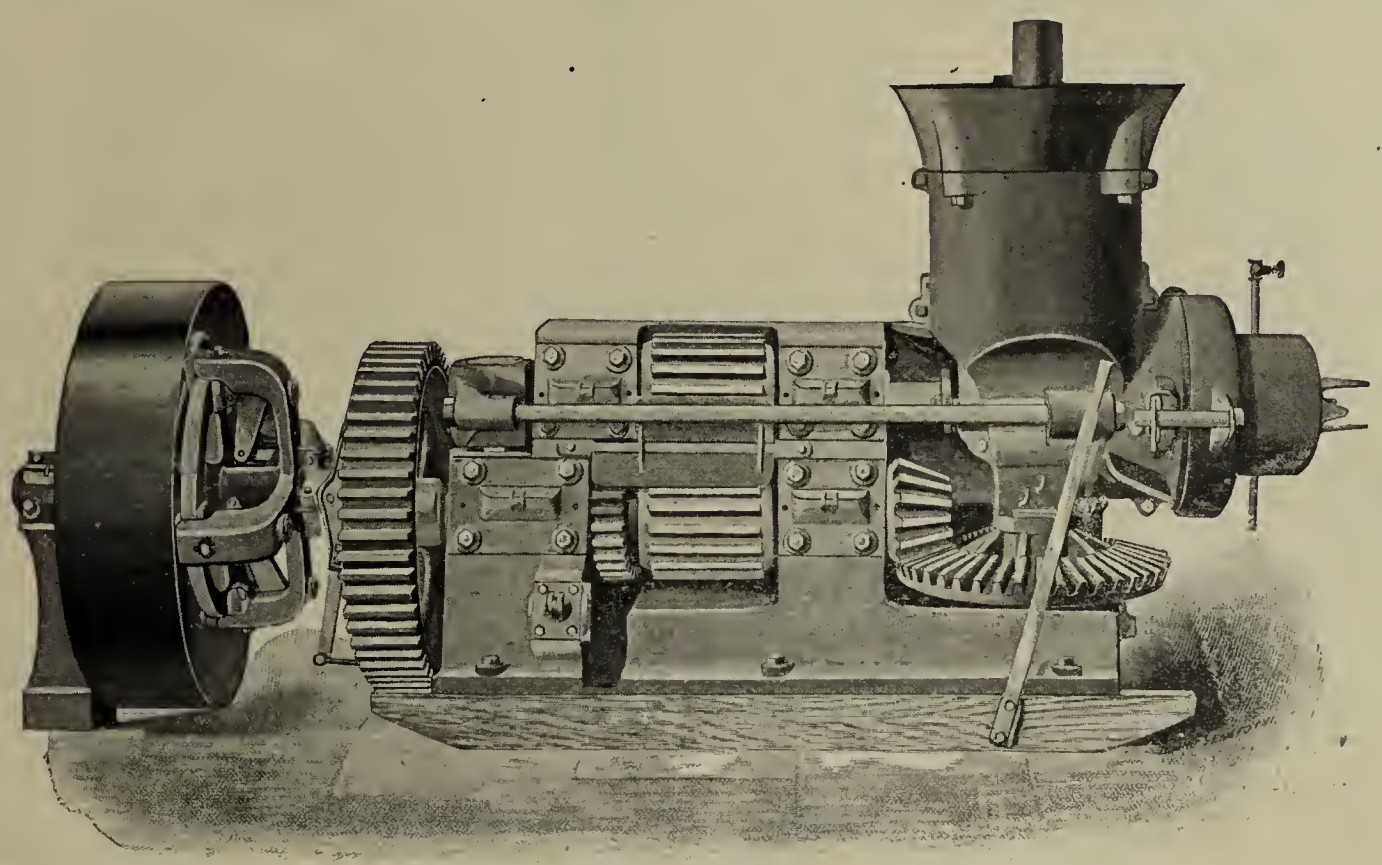
WIDOWER HIRAM—"By gosh! them comic papers is all cheats. Here I've been at this place fer three hours, spent sixty-five cents, an' I ain't engaged ter be married yet."

Have You Troubles of Your Own.

Most brickmakers have when their clay laminates.

If you have this trouble—tell us about it—let us help you bear your burdens—buy a **Wonder Brick Machine** and your troubles cease.

Lamination completely destroyed.



Big Wonder Brick Machine.

Write for our No. 16 catalogue and Good Booklet. Sent free on application.

The Wallace Mfg. Co.,

FRANKFORT, IND.

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

SOUTHERN MACHINERY CO., Charlotte, N. C., Agents for Tennessee, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina and Virginia.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

THE GOOD WEATHER continues, so do some of the manufacturers. It looks as though they wanted to take great risks in the break of the long continued dry spell. There is but one yard still running here. A few days ago they started a center arch, rather late to make a kiln of any size, as the sun has no strength, and there seems to be even a shortage of wind. In Haverstraw it is estimated that about half the yards are running. The bosses must be hoping that something will turn up to help them. From what source they expect it, no one can tell. If the coming election should result in the supremacy of the Isms as represented by one of the candidates, it is quite likely that something will turn up, and then there will be stock enough on hand to last for some time. Present indications, however, hold out no inducements to pile stock under sheds.

On the 12th of September there was a clear, bright day, and the end of the Galveston cyclone reached here, so that the yards that were molding were able to hack the green brick molded the same day, this was quite remarkable for so late in the season. There have been more days this season that the men have hacked the brick the same day they were made than was ever known before.

—Success—

in all lines of business, it is claimed, comes through knowledge, and the more thorough the knowledge of any line of trade the more certain is success assured. The success or failure of those who take up the manufacture of brick as the means by which to accumulate enough of this world's goods to make old age comfortable is of interest to those engaged in the same business, as well as others who are looking for some opening in trade.

There are two classes to be considered. The man with capital and no knowledge of the business, and the one with knowledge of the manufacture of brick acquired by labor on the brickyards from boy to man. In the one case there is no need to depend on others to conduct the working of the yard, so one would say success was certain, while he may not have as much capital as the other man. The yard is the source from which the golden returns are to come, and he is all right on that score. The man with the capital is handicapped on this point and has to take the advice of friends in engaging the man to take charge of the plant.

From this point on is the test of the ability of both men. One knows what to do and goes about it; the other is in the hands of the others and having no knowledge of the manufacture of brick is in many cases taken advantage of. In his class there are two classes of men. One that engages in the manufacture of brick himself, and the other that leaves all matters connected with the yard to the foreman. For the first week or so it is a new thing, so he may be around the yard all day, but that is not his idea of the way a brickmaker should do, and then he visits the yard morning and afternoon, then one visit of longer or shorter duration a day will be sufficient, simply to ask how things are going on. His visit to the yard will be about the same time each day, so that the men are on the lookout for him, and be ready for him.

The other man knows no more about the making of brick than this one, and may not intend to learn all the ins and outs of it by hard work. Nevertheless, he is at the yard all day. His presence is an advantage, as the men know that the "boss" is around, and there are a good many things that he can do and not work hard all the time, either. I know of one man who stayed on the yard all day until the pits were out. He made it his business to see that the sandbox was kept filled and sifted at stated times, he jarred the molds and if any of the brick pulled up at the corners he removed the little lump that had been left in the mold. He saw to it that the boy looted the yard and set the lime. He attended to innumerable little things of this sort, none of it hard work, but all of it helped in the making of a good, smooth brick. As soon as the brick was ready to stamp, he saw that no one did that but himself, and then he knew that it was well done, as he took time to do it properly, something the machine boy rarely does. As I have said, he was always to be found on the yard except one day in the week, when he went to New York city to keep in touch with the markets. As a brickmaker, he was a success, though a painter by trade, while others who were in the business at the same time were failures.

Trade conditions, of course, have much to do with the failure or success of the brickmaker. There are times when a man cannot help making money, the demand being such that anything in the shape of a brick meets with a ready sale. A fair trial as to the ability of men in the brick business, so far as making money is concerned, is when the market is close to the non-paying point.

To-day, of all the men engaged in the brickmaking business, there is but one that I can now recall who is living on the profits of that business who is making brick on his own account. This is simply because the man who works as a foreman for others, when he starts in business for himself, thinks he must be boss, and so he ceases to take charge of his own yard and hires a foreman. For the first year or two he may take charge, but, as a rule, at the end of that time he lets his experience go for naught, turns his yard over to a foreman and his expenses increase, and the next thing you know he is again working on another yard as foreman.

The one man to whom I have just referred as running his own yard did not follow this course, but by close attention to the yard, working harder, if possible, than in former days, made money and no one in the town in which he lives is more respected. At present he has to take things easy, because he is getting old, but he still gives his yard close attention.

The trade has changed. Forty years or more ago a man with a few hundred dollars could make a start for himself if he could find a suitable place for a yard, a pair of old horses, an old machine in which to grind the clay, enough lumber to build a cover for his hacks, with plenty of hard work on his part and a helping hand from his family, both male and female. His house was as close to the yard as it was possible to get it, and in most cases the sleeping-room for the yard hands was in the upper part, and the men boarded with the family, and all of the family, as well as the boss, sat at the same table and the same food. The few dollars made were carefully taken care of, every cent saved, and by such economy, the brickmaker accumulated wealth, which he, as a rule, invested in farm land.

To-day business is carried on in a different way. A few hundred dollars is nothing. A man must have thousands before he can start in the brick business. The brickmaker lives in town and cuts as wide a swath as possible, drives to the yard—thinks it is as essential to have a horse to drive as wood to burn, and some of them soon cease to be brickmakers. The conservative man conducts business as he has always done, and hence is successful. No one would advocate following in the footsteps of the brickmaker of forty years ago, but if the brickmakers of to-day would curtail some of their expenses, which they could do very well, more of them would succeed in making brick and money, too.

—The Market—

Absorbs what stock is sent in, but up to the past week the prices have not improved any, in fact, in the past month there has been a drop of twenty-five cents per thousand. The weather has been fine for laying brick, and the shipments have been of sufficient quantity to meet all demands and a few barges left over. It may be that the buyer has done so well during the summer that he will let the brick man have a few of the crumbs at the last of the season.

The last week in September the market showed an increase of twenty-five cents per thousand. In six weeks navigation will close and if the powers that be would allow twenty-five cents per week for the rest of the season the advance would amount to $1.50 by the close, and even this price would not mean $5.00 per thousand on the majority of the brick shipped.

Haverstraws, $4.00 at $4.25 at $4.50, special.

Newburgh Bay, $4.00 at $4.25 at $4.50, special.

Up River, $4.00 at $4.25.

Hackensack, none on market.

Pale, $1.50 at $1.75.

The most remarkable event of the month is the fact that the number of building permits the past week exceeded that of the same week last year, being 48 for this year and 45 for 1899. From Jan. 1 to Sept. 27, 1899, there were 3,454 permits issued, for the same period in 1900 but 1,400. It hardly seems possible there could be such a falling off. The approximate cost of the buildings for which permits were issued last year was $90,477,942, while this year it was but $43,126,740.

A. N. OLDTIMER.

Hackensack, N. J., Oct. 1, 1900.

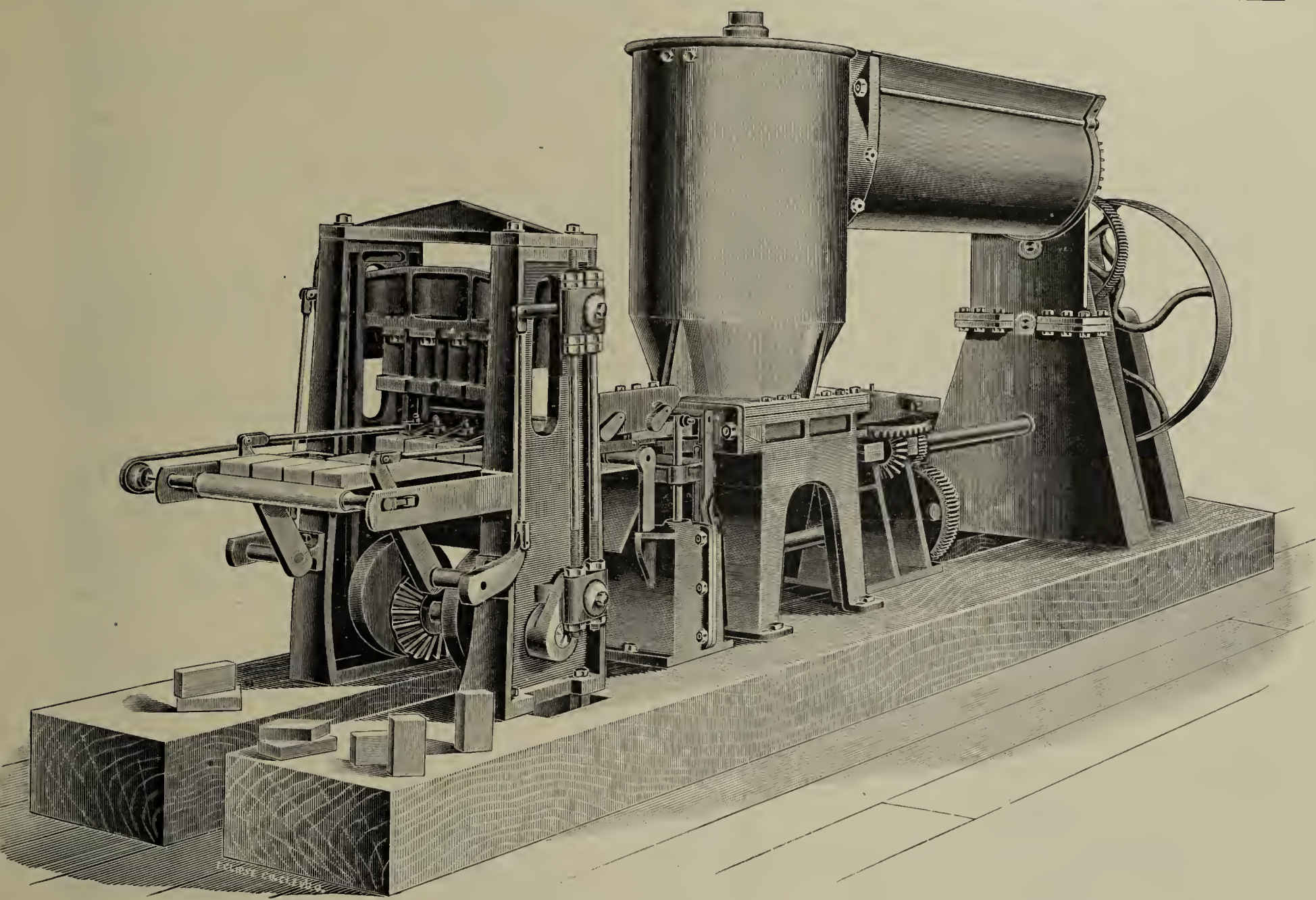
A Perfect Brick Machine.

STRONG, POWERFUL, SIMPLE and POSITIVE.

Absolutely Unbreakable. **Less Working Parts than any other Machine.**
Without Repressing Attachment.

The DICTATOR BRICK MACHINE will take the Clay or Shale as it comes from the bank or Dry Pan and automatically produce perfect repressed brick.

NO LAMINATION.



DICTATOR BRICK MACHINE. Capacity 40,000 Perfect Repressed Brick per day.

The only machine in the World, that will Automatically produce perfect Repressed Brick.

The Battenfeld Mfg. Co.,

Write for Catalogue. *922 Garfield Bldg, CLEVELAND, OHIO.*

WRITTEN FOR THE CLAY-WORKER.

PACIFIC COAST NEWS.

THE TERRA COTTA dealers report more or less work on hand, most of which, however, of small calibre, but it aggregates a good sum total. The strike of the millmen still hangs on, and its effect on trade is keenly felt. The outlook for the coming season is said to be good, as quite a number of large buildings are going to be added to the list of structures of San Francisco.

N. Clarke & Sons are quite busy at their works in Alameda, Cal., while a sufficient number of contracts are on hand to cause good times with this concern.

The Steiger Terra Cotta and Pottery Works are to furnish the Akron roof tile for the elegant new Stearn residence, on Pacific Heights, in this city. About $2,000 worth of this material will be required.

J. B. Raine, of Westminster, Cal., reports having started up the machinery at his drain tile factory, and made a few thousand brick, but as the demand for drain tile is going to be much larger than was anticipated, machinery of greater capacity will be needed and has been ordered from the East. The business promises to prove a success, as many orders have been received and more will follow just as soon as it is demonstrated that the product of the factory will satisfactorily fill the bill.

Garrett Bros., the brick men of North Yakima, Wash., will put in a steam power plant and add extensively to their other machinery.

Vern Litherland, of Fulton, Oregon, has gone to Honolulu, Hawaiian Islands, where he will engage in the manufacture of brick under the direction of his uncle, Frank L. Litherland. Frank Litherland was formerly in the employ of the Portland Clay Co. in their brick plant at Fulton, but he received samples of brick clay from Hawaii, which was such a satisfactory article that he determined to establish a brickyard there. He has possession of the only brick clay bank in Honolulu, and is said to have secured an excellent market for the output.

The two brickyards on the Section Line road, near Portland, Ore., are running to their full capacity and turning out many thousand brick a month. One of these yards was started up only a few months ago. It came in response to the demand of building operations, which have been more active during the past year than for some years. There was almost a brick famine last spring, and the owners of the small stock on hand at the time were able to command almost any price they saw fit to ask.

Some parties in Los Banos, Cal., have engaged G. B. Craycroft, of Visalia, this State, to burn 400,000 brick to construct the new school building. Mr. Craycroft expects to turn out about 17,000 brick a day.

The Bryant Lumber and Shingle Co. has started a brickyard at Fremont, Wash.

Additions are continually being made to the already large list of brick business structures in Spokane, Wash. Within a small radius office buildings aggregating $448,000 are now being erected.

E. B. McNear is putting in a fine brick machine at his newly opened brickyards near Point Pedro, Marin county, Cal. The machine is capable of putting out 35,000 to 40,000 brick a day.

The Washington Brick and Lime Co., of Spokane, Wash., will shortly move from its present premises on Stevens street to neat brick offices at the corner of Stevens and First streets, Spokane.

Raines & Son have completed a brick and tile yard two miles south of Oceanview, Cal., and molded the first of their product. They will commence burning in a few days. The quality of the clay they have to draw upon is excellent and, it is believed, will make a superior quality. All the tile that yard can put out will find ready market. Quite a lot of brick is already contracted for.

Williams & Kruegel have fired a kiln of brick at Asotin, Wash., which contains about 120,000 brick. This is the third kiln to be burned there this season, and will probably be the last for the season.

A shipment of 23,000 brick has been made to Alaska, which is about the largest shipment ever sent to that region. The bricks are of good quality and were obtained in Vancouver, B. C. They were sent by A. M. Macgowan & Co. for the White Pass Railway Co., and are intended for station purposes at Bennett, White Horse and other places.

A large kiln of brick is being burned in Angels, Cal., for the new chlorination works of the Lightner mine.

A snow-white rock is now being quarried near Murietta, Cal., and is shipped to Los Angeles for the manufacture of brick.

The Simmons-Font Brick Co. have been granted permission by the Board of Supervisors to start a brickmaking plant near Twin Peaks, San Francisco.

Mr. Betz has started another brickyard on the Sherwood road, about a mile and a half from Fort Bragg, Cal. He intends to burn a kiln containing 300,000 brick, and will cover them over with a shed 100 feet square.

The brickmaking plant now under course of construction at South Seattle, Wash., by capitalists of New York is well under way. The plant will have a capacity of 12,000,000 bricks a year.

H. B. Nelson, of Weston, Ore., has disposed of 70,000 brick to be used in the rebuilding of Pomeroy, which was recently destroyed by fire.

A very fine vitrified brick is being made at the Territorial penitentiary, Las Vegas, N. M., which is being used in Santa Fe, N. M., for sidewalks.

The brick kiln at Pegden's place, near Susanville, Cal., is growing fast, and will be a large one. Fires will be started there in a short time.

SUNSET.

San Francisco Cal., Oct. 5, 1900.

HIS MARK.

ATTORNEY—"As you are unable to write your name I will affix your signature to the document and you can make your mark by the side of it."

BRONCO BILL (bang!)—"Thar ye are, sir."

ST. LOUIS NOTES.

THE FALL SEASON has developed very little new business in the building line, so that this year will go into history as the poorest year ever known in the building trade of modern St. Louis. Last year was supposed to be rock-bottom, or zero, but this year has gone below zero, thanks to the labor agitation and strikes. For the early spring outlook was very encouraging, and much new work was brought to the architects, but the rumble and demands of the Building Trades Council, with the horrible example of Chicago, frightened off all work that would permit of postponement, and the subsequent strikes proved the wisdom of this course. Nor will all of this work eventually go forward, as some of this capital will drift off into other channels, and so the too-grasping labor-union official has again killed the goose that laid the golden egg. For the consumption of brick in St. Louis this season will not exceed a total of 70,000,000, which one company alone would call a small year's business, and this has had to be divided among over sixteen yards; so brickyard properties can be bought at bargain prices in St. Louis. Fortunately, there has been some fair out-of-town trade to help along, or the season would have been most disastrous.

The Superior Press Brick Company has been fairly active, and is now making not only common and red stock brick, but is going into grays and granites, and even contemplates the dangerous paths of enamel brick—the rock that has proved fatal to so many.

The big Union yard has been idle most of the season, and is going to abandon its illusive continuous kiln, as the pros have not been found to offset the cons after operating it for two years.

The Alton paving brickyard has had a busy season with its pavers, and is shipping to the Chicago market.

The Standard Tile Company recently had its smokestack blown down in a young cyclone, but no further damage was done beyond a short delay.

The only clayworkers represented at the annual St. Louis Exposition this year are the Hydraulic Press Brick Company, the Winkle Terra Cotta Company and the Standard Tile Company. The Hydraulic people exhibit a very complete line of stock and enameled brick in all shapes, shades and colors, while their mantel and fireplace display shows how attractive and ornamental this feature can be made when good taste is used. The Winkle people exhibit some bold work in building terra cotta and also some sanitary wash tubs in white enameled goods, that look clean and attractive, which is a new department. The Standard Tile Company has an interesting pagoda that is roofed with a variety of shapes and shades of tile and terra cotta trimmings, besides a very complete series of roofing tile in all designs and colors.

Street improvements are again occupying the attention of the city fathers, and considerable brick will soon be wanted for the new pavements. One of the greatest advantages that the St. Louisans will reap from the World's Fair that is to celebrate the Louisiana purchase, will be the paved streets and filtered water that will be necessary to introduce before St. Louis invites the world to come within her hospitable gates. For the heavy mileage of utterly unpaved streets that now disgraces the city will have to be paved and put in order before the fair visitors arrive, and brick will undoubtedly be largely used on much of this work. So the paving brickmakers will soon have a big market here and the home building brickyards anticipate that the present famine is the preparation for a series of very prosperous years—a feast that they have well earned.

"LOUIS."

Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

DO YOU KNOW

We Manufacture

Stock or Front Bricks,
Ornamental or Shape Brick
...IN...
RED, GRANITE,
BUFF, GRAY
and MOTTLED.

The PROGRESS
BRICK PRESS.

Complete Brick Yard Equipments
Brick Yard Supplies.
Catalogue on Application.

We issue a Catalogue on Ornamental and Shape Bricks on application, and offer a liberal discount to dealers.

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. ***ST. LOUIS, MO.***

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

FOR SALE—Cheap, Freese Brick and Tile Machine, 20,000 capacity brick, 10,000 capacity three-inch tile; pug mill and cut-off table. Plant complete except power. All machinery in good shape ready to run Address
10 1 d HUGH, care Clay-Worker.

WANTED—Position by thoroughly competent man, who understands the manufacture of glazed brick, scullery sinks and bath tubs; also the mixing of glazes; can give reference. Address, WM. B.,
10 1 r Care Clay-Worker.

WANTED—An opening for a modern dry press brick plant; parties having suitable clay for the manufacture of fine red pressed brick, buff brick or mottled brick, situated near a railroad or navigable stream, are requested to correspond with
A MANUFACTURER,
10 tf r Care Clay-Worker.

WANTED—A man competent to take charge of a brick plant; one who is familiar with making, setting and burning dry press brick. The plant has been in successful operation for years past; the past two years has paid 20 per cent. dividend. To the right man will sell an interest in the plant to interest him permanently in the work, and will pay a good salary. Applicant must be thoroughly reliable and competent to conduct the work skillfully. To such a man the opportunity is a rare one. Full particulars to those interested who mean business. Address,
ROMAN BRICK,
10 1 r Care Clay-Worker.

FOR SALE—A brickyard and tile factory, in first-class condition and crowded with business. The owner is aged and feeble in health and must sell. There are 42½ acres of land, having an abundance of brick and tile clay and some fire clay. The plant is complete, having kilns, steel-roofed sheds, 40 horse-power engine, Horton brick machine, twenty to thirty thousand daily capacity; a tile machine, with dies from 3 to 12 inches; thirty acres of the land is under cultivation, with a good six-room dwelling, barn and sheds for wagons; 1 pair of horses, 2 wagons, 1 buggy, with farming implements; plant is located one mile north of Syracuse, Ind., where the Sandusky Cement Co. has just completed a mammoth cement works, and the town is growing fast; no other brick or tile works within ten miles. This is a rare chance for a young man of energy and small capital. Address owner, DICK CLARK,
10 1 2 Care Clay-Worker.

GOOD MEN WANTED.

Wanted, two good burners and a superintendent or yard foreman, competent to manage men and run a stiff-clay brickyard. Steady work and good wages to the right men; must be sober and industrious. Write, giving name of last employer and any other references thought desirable, to
10 1 r E. U. D., care Clay-Worker.

A GOOD MAN

Wants a situation as superintendent or general manager of a dry press brick plant. Understand thoroughly every detail of the business; expert in the manufacture of ornamental brick; also the production of flashed and mottled brick; good salary will be required and good service will be rendered; permanent, not temporary, situation wanted. Address, I. X. L.,
10 3 r Care Clay-Worker.

For Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan Bark, Cinders, Ores, Sawdust, Lime, Cement, etc. Also continuous Pan Conveyors.

Iowa Pipe and Tile Co , Des Moines, Iowa.
Borden & Selleck Co , Chicago:
Gentlemen—We have used the Harrison Conveyor for the past two years. It takes about ninety tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours truly, IOWA PIPE & TILE CO.

BORDEN & SELLECK CO., Mfrs. and Sole Agents, **48 & 50 Lake St., Chicago.**
Send for illustrated Catalogue.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

The Belt for the Brick Yard

Is the one that is not impaired in length or kind of service, when subjected to excessive weather, moisture or dust conditions. There is only one constructed to withstand these without injury, and it is

LEVIATHAN BELTING.

Our customers bear us out in this, and a trial order will demonstrate it to you.

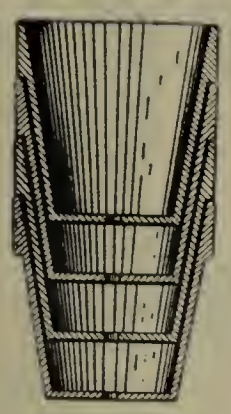
MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.
55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.
Write for Samples and Price Lists.

BOOKS FOR BRICKMAKERS,

"CLAY GLAZES AND ENAMELS," H. R. Griffen	$5.00
"BRICKMAKERS' MANUAL," Morrison and Reep	3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr.	2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley	1.00
"VITRIFIED PAVING BRICK" H. A. Wheeler, E. M.	1.00
"PRACTICAL FARM DRAINAGE," J. J. W. Billingsley	1.00

Mailed, postage prepaid to any address on receipt of price.

T. A. RANDALL & CO.,
The Clay-Worker.
INDIANAPOLIS, IND.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,

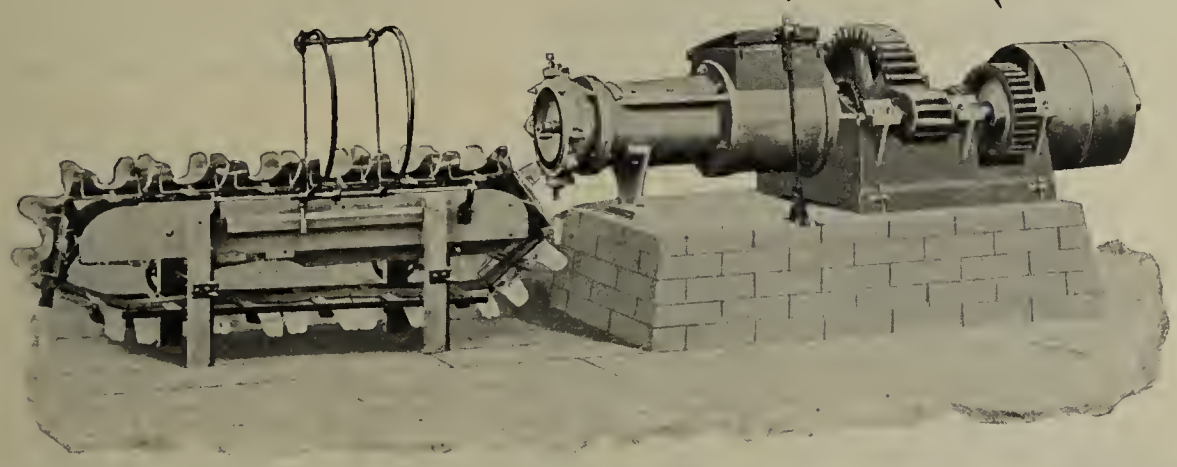
78 South Pennsylvania St., INDIANAPOLIS, IND.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,

Detroit, Mich., U. S. A.

FOR SALE—Ohio Tile Works. In good shape; good location, good trade; cheap.
10 3 c Address L., care Clay-Worker.

FOR SALE—Perfection Repress No. 5. Raymond make. Almost new. Only 10,000 repressed by it. Address Box 422,
10 1 cm New Cumberland, W. Va.

WANTED—Combined pug and brick machine of 30,000 daily capacity. Must be in perfect order. Address
10 1 c HAME, care Clay-Worker.

FOR SALE—One 40-horse-power engine, horizontal soft mud brick machine, trucks, brick barrows, belting, etc. All in good shape.
10 1 c A. R. M., care Clay-Worker.

FOR SALE—Clay, buff or cream-colored when burned. Also red and white mottled clay. Address
NORTH END COAL CO.,
10 2 cm Canton, Ohio.

"CORRESPONDENCE SOLICITED with Eastern or Western brickyard; manufacture new kind German perforated radial chimney bricks, for high chimneys."
LOUIS FORT, C. E.,
9 3 c 312 E. Thirteenth St., N. Y. city.

WANTED—By responsible parties, the agency for the sale of enameled brick for the city of St. Louis, or will buy outright for cash at reasonable prices, to resell.
Address WM. BLANFUSS,
10 1 d 2844 Henrietta St., St. Louis, Mo.

WANTED—A foreman for brick and terra cotta works. One who understands how to make and burn stiff mud brick and fireproofing. State age, past experience and give reference and salary wanted. Address
WASHINGTON, care Clay-Worker.
10 1 d

FOR SALE—Complete soft mud brick plant, including land; the only yard of its kind; located in a growing northern Ohio county seat of 40,000 inhabitants. Will be sold for half price to first cash buyer.
THE HORTON MFG. CO.,
M'nuf't'rs of Clayworking Machinery,
10 1 1 Painesville, O.

WANTED—Situation as superintendent or foreman of brick works. Twenty-five years' experience in manufacturing of bricks by dry press or stiff mud process, and building of kilns and burning the same, both down-draft and continuous kilns. Address
WINSTON,
10 1 p Care Clay-Worker.

BRICK MACHINERY FOR SALE.

One 6 mold Ross Keller Brick Machine, $2,500.
One 2 mold Whitaker Brick Machine, $800.
Also Disintegrators, Pulverizers,
Wheel Scrapers, Cars, Trucks, Pumps,
Boilers, Engines, Kiln Doors and Frames, Grates,
Steam Pumps, etc., in fact, the entire equipment of a large first-class brickyard.
Will sell the same in whole or in parts to suit.
For particulars and prices address
SCHOELLHORN-ALBRECHT MACHINE CO.,
8 tf d 420 N. Main St., St. Louis, Mo.

FOR SALE—Cheap, one intermediate wonder brick machine, which we purchased new from the manufacturers in 1898, and have used about six weeks.
LUDOWICI ROOFING TILE CO.,
8 tf d 508 Chamber of Commerce, Chicago.

FOR SALE—One three-mold Andrus dry press; in good condition; would not be sold but for the fact we no longer make dry press brick; cheap for cash or on time to responsible parties.
COALDALE PAVING BRICK CO.,
9 tf r Birmingham, Ala.

WANTED—A situation by a thoroughly practical and reliable brickmaker; will take superintendency of plant or foremanship of yard or burning crew; best of references as to ability and character; no bad habits; permanent situation wanted. Address,
9 1 ? GEO. BRETON, care Clay-Worker.

WANTED—A situation as superintendent or foreman of terra cotta, tile or pressed brick plant. Understand all the details of making and burning porous terra cotta. Also the construction of kilns of all sorts. Satisfied with moderate salary if the situation is permanent. Best of references. Address
8 tf tr MILFORD, care Clay-Worker.

FOR SALE—Big Wonder brick machine, with iron pug mill, fitted for the manufacture of either side cut or end cut brick; also, one Columbia single die repress, all in first-class condition. Reason for selling, no clay at our plant suitable for the machine. For further particulars address LEXINGTON BRICK CO.,
7 tf d Lexington, Ky.

FOR SALE.

One 8 foot wet pan, wood frame.
Two 9-foot dry pans, wood frame.
One 9-foot dry pan, iron frame.
One stiff clay auger machine.
THE T. B. TOWNSEND BRICK & CONTRACTING CO.,
9 tf d Zanesville, O.

FOR SALE—A RARE CHANCE.

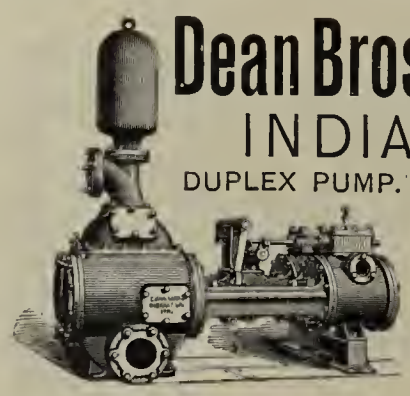
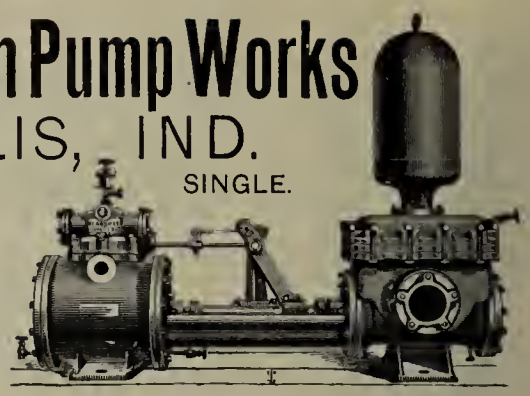
Complete equipment for 12 track Standard Drier, 125 feet long, of heaviest pipe, including 14,000 six brick pallets, 204 steel cars for soft mud brick, etc, etc. All used but little and most practically good as new. Also one Simpson Dry Press Machine. Will sell separately. Address E. G. A., care Clay-Worker.

CONTINUOUS KILN PLANS.

TEN DOLLARS will buy blue prints and full specifications for building and operating the best and cheapest continuous kiln for common brick; capacity, 20,000 per day; cost, $2,000; open top; mechanical draft; will burn 90 per cent. hard brick and save its cost in fuel in two years. Write for particulars. WM. M. IRWIN,
2525 S. Fifteenth St., St. Joseph, Mo.

BARGAINS IN SECOND-HAND MACHINES.

One second-hand Simpson 4-mould brick press.
One 9x15 rock crusher.
One second-hand winding drum, with pulleys and cable complete.
One lot of contractors' dump cars and 25 horse-power engine and boiler, with all fixtures. Address,
HENRY MARTIN BRICK MACHINE MF'G. CO., Lancaster, Pa.

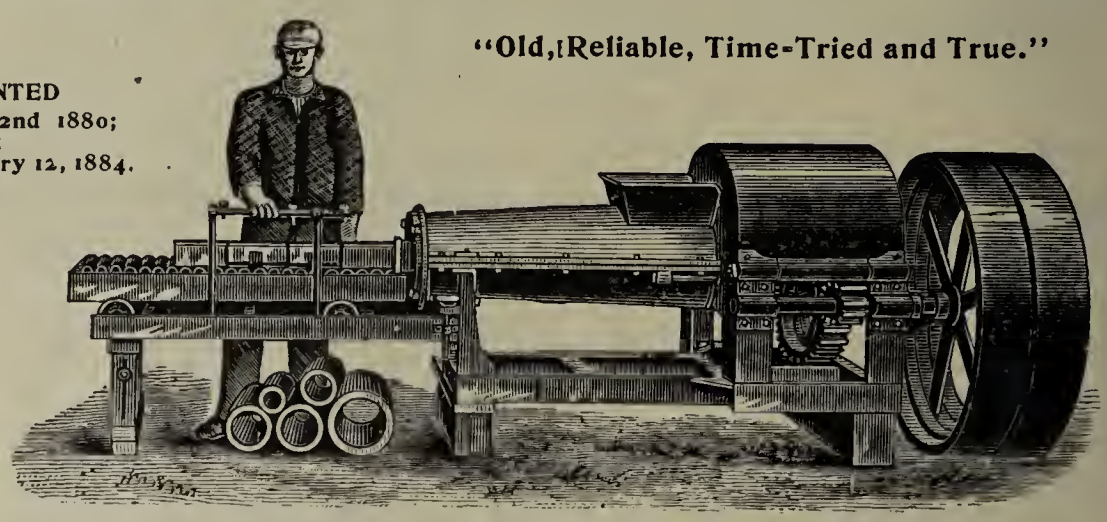

Dean Bros.' Steam Pump Works
INDIANAPOLIS, IND.
DUPLEX PUMP. SINGLE.
PUMPING MACHINERY FOR ALL PURPOSES.
SEND FOR CATALOGUE AND PRICES.


IF YOU NEED.. Wooden Pallets
WE CAN FURNISH YOU THE BEST

We make all Styes of
Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*
We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

W. B. MERSHON & CO.,
Saginaw. East Side Mich.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES
"Old, Reliable, Time-Tried and True."
PATENTED June 22nd 1880; and February 12, 1884.

P. H. Kells, the Original Inventor of the Auger Machine

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.
For Illustrated Circulars, Prices, Etc., address
KELLS' FOUNDRY & MACHINE CO., Adrian, Mich.

H. C. BAIRD & SON,
PARKHILL, ONTARIO.
Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

MORRISON'S LATEST IMPROVED KILN

For Burning Building Brick.

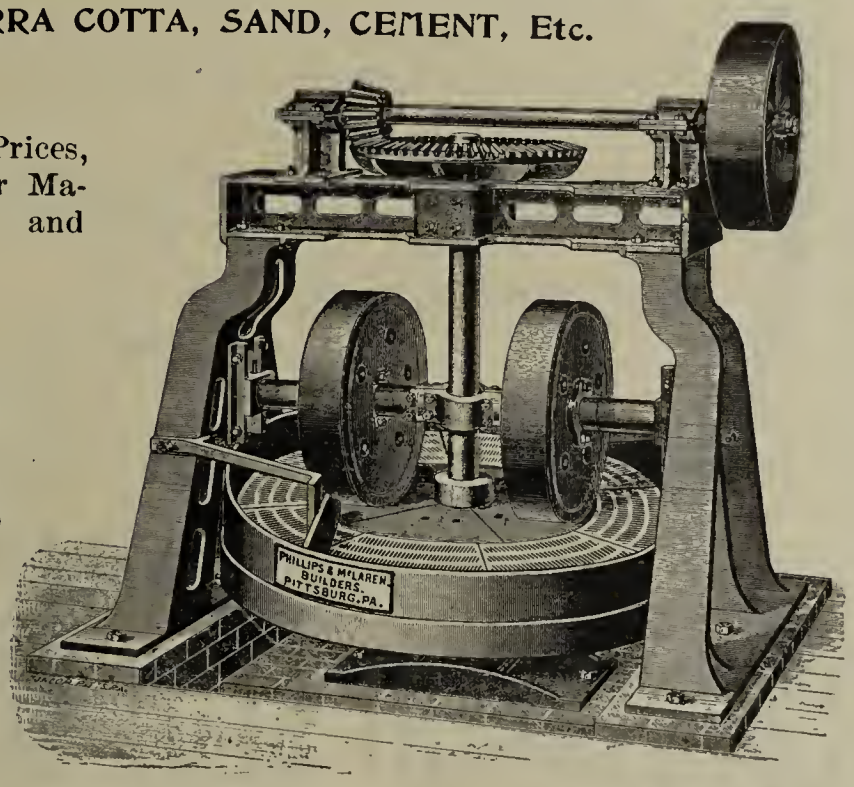
It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object. Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,
P. O. Box 335, Rome, Ga., U. S. A.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.



Phillips and McLaren,

Proprietors,

Fisher Engine, Foundry and Machine Works.

24th and Smallman Sts., PITTSBURG, PA.

"La Brique" (The BRICK,)

ORGAN OF THE BRICK AND CERAMIC INDUSTRIES IN THE FRENCH SPEAKING COUNTRIES.

Published Monthly, Annual Subscription, $1.50.

10,000 copies sent by post and guaranteed by receipt from Postmaster.

Prices of Advertisements.

FOR ONE YEAR:		FOR ONE INSERTION:	
One Page,	$80.	One Page,	$40
One-half Page,	$50.	One-half Page,	$30
One-quarter Page,	$30.	One-quarter Page,	$20
One-eighth Page,	$20.	One-eighth Page,	$15

PAYABLE IN ADVANCE.

All correspondence to be addressed to

Mr. H. DeWit,

61 Rue Bodeghem, Bruxelles, Belgium.

Most forcible means of becoming known throughout the World, for Brick Engineers. Before the end of the year the journal will be published in English, French and German, so that it may be read by every brickmaker in any part of the world! With the publication in three languages prices of subscription and advertisements will be augmented except for those who will have already signed contracts.

Subscriptions and Advertisements for "La Brique"
Are received by the Publishers of THE CLAY-WORKER, Indianapolis.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
6 tf d Wellsburg, W. Va.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE.

One Iron Standard Steam Power Machine, with pug-mill attached.
One Anderson Brick Machine, with 12-foot Pug Mill.
One new Brewer Crusher; one second-hand Brewer Crusher.
One Carnell Repress.
One Penfield Soft Mud Machine.
One 40-h. p. Boiler and Engine.
One Monarch Machine, used two summer seasons; in excellent repair.
THE HORTON MFG. CO.,
8 1 1 Painesville, Ohio.

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.
PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.
SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH.
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 4 tf d

Davis's Brick, Tiles and Terra Cotta. Third Edition. Revised, Improved and Enlarged.

A Practical Treatise on the Manufacture of

Brick, Tiles and Terra-Cotta:

Including Stiff Clay, Dry Clay, Hand-made, Pressed or Front, and Roadway Paving Brick, Enameled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra Cotta, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics, and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace With a Detailed Description of the different clays employed, the most Modern Machinery, Tools and Kilns used, and the processes for Handling, Disintegrating, Tempering and Molding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition. Revised and in great part rewritten. Illustrated by 261 engravings. 662 pages, 8vo. Price, ...**$5.00**

☞ *This volume will be sent by mail to any address in the world, or delivered by express C. O. D, freight paid, to any address in the United States for*.....**$5.00**

☞ *A circular of eight pages with specimens of the illustrations, showing the full Table of Contents, will be sent free to any one furnishing his address.*

☞ *Our New and Revised Catalogue of Practical and Scientific Books, 92 pages, 8vo, a New Catalogue of Books on Steam, the Steam Engine, etc., and our other Catalogues and Circulars, the whole covering every branch of Science applied to the Arts, sent free and free of postage to any one in any part of the world who will furnish us with his address.*

HENRY CAREY BAIRD & CO.,
Industrial Publishers, Booksellers and Importers,
810 Walnut St. PHILADELPHIA, PA., U. S. A.

$6.95 to $99.75

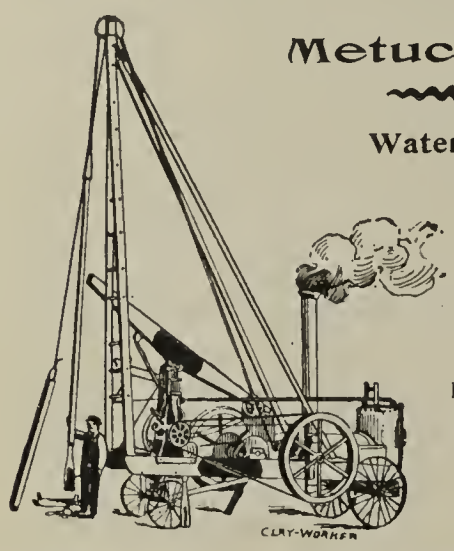
At from $6.95 for a 100-pound house safe to $99.75 for a very large double outside and double inside door bank or public office safe, we sell the **HIGHEST GRADE FIRE-PROOF COMBINATION LOCK SAFES MADE,** letter your own or firm name on, and ship to anyone any place in the United States, **payable after received.** For $23.95 we sell a good size safe for any store, office, factory, shop or hotel. **We will save you more than one-half in price.** For full particulars, special safe catalogue, special pay-after-received offer, etc., cut this notice out and mail to us. **SEARS, ROEBUCK & CO., CHICAGO.**

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

W. R. Osborne,



Metuchen, N. J.

Water Wells, Tanks, Pumps, Etc.

LOW PRICES

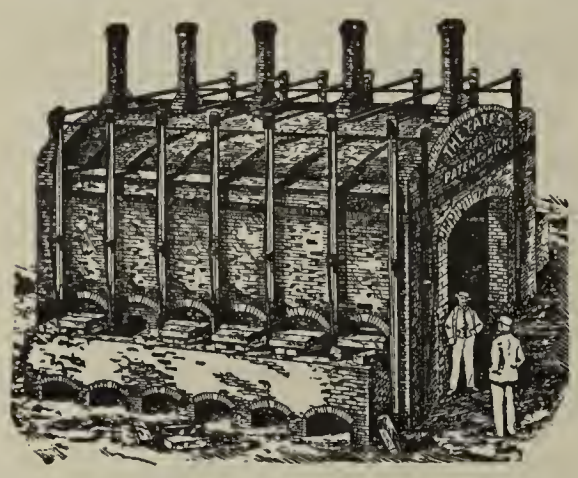
Drying Economy.

Our Dryer is superior to others by reason of improved methods, low cost of construction and economy of operation. If you're interested in dryers write for particulars. Ours will prove a good investment.

We also manufacture Conveyors, Exhausters, Heaters, Fans, Engines and Mechanical Draft Apparatus.

THE NEW YORK BLOWER CO.,
Bucyrus, Ohio.

NEW YORK OFFICE
39-41 Cortlandt St., New York, N. Y.
BOSTON OFFICE:
185 Summer St., Boston, Mass.



Economy of Fuel and Large Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.
Hot air dryer. Continuous and Muffle Kiln

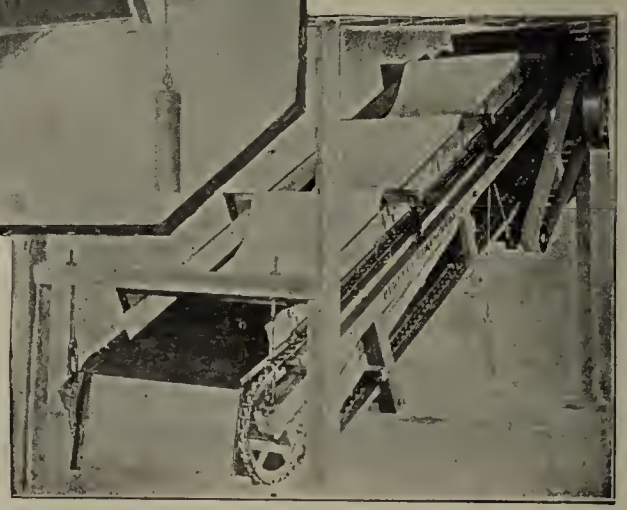
ALFRED YATES,
JOHNSONBURG, PENN

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush.

HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels, Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., Western Ave. 17th-18th St. CHICAGO, ILL.

Our new Catalogue No. 25 (380 pages), will be sent upon application.

New Illustrated Catalogue

NOW READY.

ELEVATING and CONVEYING Machinery

Send for Copy.

Address

The Jeffrey Mfg. Co., COLUMBUS, OHIO.

41 Dey St., NEW YORK. 544 Equitable Bldg., DENVER.

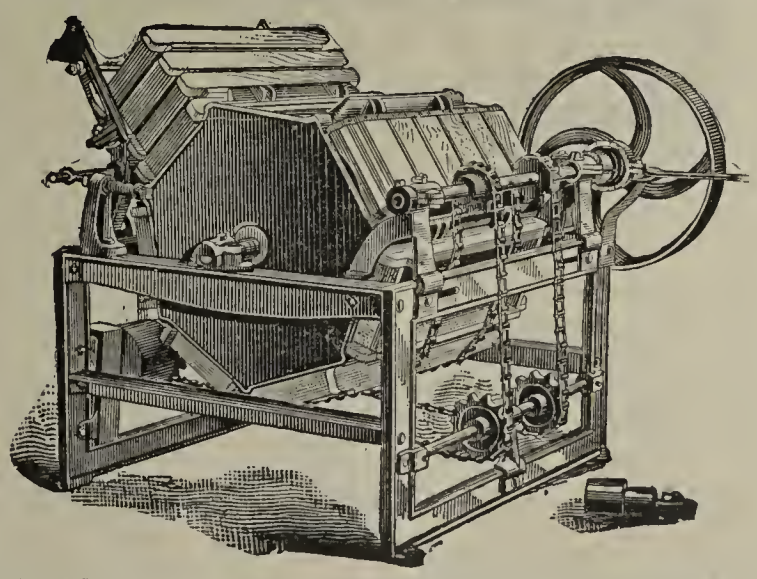
CHAMPION Brick Mould

SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of WELLS & HALL,
Successors to WESTBROOK & WELLS,
Ogdensburg, N. Y.

VanDuzen's STEAM JET Pumps.

Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.

NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. Carbonate of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

LE CHATELIER'S

PYROMETER

For measuring temperatures between 0 and 1600° Celsius, equal to 2920° Fahrenheit.

RECOMMENDED BY THE HIGHEST AUTHORITIES, and Successfully used in establishments for the manufacture of

BRICKS, TILE, TERRA COTTA, STONE WARE, PORCELAIN, IN POTTERIES AND ALL CLAY WORKING INDUSTRIES, as well as

IRON AND STEEL AND ALL OTHER METALS,

Gas,	Chamotte,
Glass,	Chemicals,
Sugar,	Cement,
Accumulators,	Incandescent Lamps,

Cartridges and Ammunition.

Also by Boiler Inspectors, Schools and Colleges and for **Hardening and Annealing Steel in Roll Foundries, Etc.**

CONSTRUCTED BY

W. C. HERAEUS, Platinum Works,
Hanau, Germany.

Prices and Descriptive Pamphlet on Application.

REPRESENTATIVE:

CHARLES ENGELHARD,
41 Cortlandt Street, New York, N. Y.

ODD LENGTHS OF RUBBER AND GIANT RED STITCHED, from 2 ft. to 80 ft. long, and from 1 in. to 16 in. wide; 3, 4, 5, 6 and 8 ply. **First-Class Belting** less than mfrs. cost prices. **Get Our Prices** on Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gages, Brass Fittings, Hard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws, Asphalt Felt Roofing, Endless Thresher Belts. **One Trial** will make you a regular customer of the **MILLER OIL AND SUPPLY COMPANY, 36 McNabb St., Indianapolis, Ind.**

Eureka Brick Elevator, Made in Four Styles.

A slick profitable device for handling brick in kiln or boat.

A. C. Newton, Manufacturing Patentee, **Crescent, N. Y.**

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent. CINCINNATI, OHIO

H. W. FULLER, Gen'l Pass. Agent, WASHINGTON, D. C.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 3:05 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 12:20 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY.

Lv Indianapolis, 4:10 am. 8:05 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

The VANDALIA LINE

The Short Line for St Louis and the West.

Leave Indianapolis.	Arrive at Terre Haute.	Arrive St. Louis
No. 15 7:25 am,	9:55 am	5:00 pm
No. 5 6:45 am	8:35 am	12:56 pm
No. 21 12:15 pm	2:05 pm	6:40 pm
No. 7 3:30 pm	5:10 pm	9:40 pm
No. 11 7:05 pm	9:00 pm	1:44 am
No. 19 11:20 pm	1:50 am	7:12 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No. 15, daily 7:25 a m for Terre Haute and St. Louis.

No. 3 Ex. Sunday 4:00 pm. for Terre Haute.

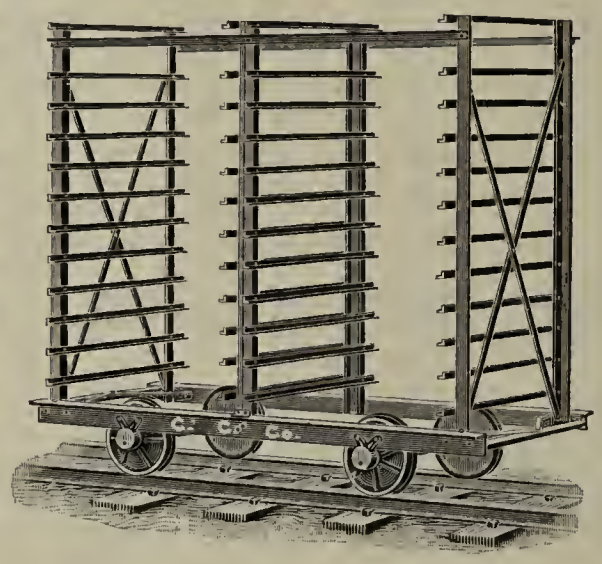
*Sunday only.

All trains carry first-class coaches.

12:15 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent, Indianapolis, Ind.

E. A. FORD, G. P. A.



No. 257 SOFT MUD RACK. Angle Frame.

OUR Specialty is the building of Dryer Cars. There are none better. Quality is our aim.

LIGHT,
RIGID,
SERVICEABLE,
STRONG,
DURABLE,
EASY RUNNING.

If interested write for particulars and information.

The CLEVELAND CAR CO.,
Cleveland, Ohio.

A CARTON OF

R·I·P·A·N·S

TABULES, Costs 5 cents.

IT HOLDS TEN TABULES and many people insist that the contents of even one carton has done them more good than quantities of other medicine. It is certain that in curing indigestion, constipation, biliousness, sour stomach and many more like evils there is nothing better than R-I-P-A-N-S.

WANTED:—A case of bad health that R·I·P·A·N·S will not benefit. They banish pain and prolong life. One gives relief. Note the word R·I·P·A·N·S on the package and accept no substitute. R·I·P·A·N·S, 10 for 5 cents, may be had at any drug store. Ten samples and one thousand testimonials will be mailed to any address for 5 cents, forwarded to the Ripans Chemical Co., No. 10 Spruce St., New York.

PATENTS GUARANTEED

Our fee returned if we fail. Any one sending sketch and description of any invention will promptly receive our opinion free concerning the patentability of same. "How to obtain a patent" sent upon request. Patents secured through us advertised for sale at our expense.

Patents taken out through us receive *special notice*, without charge, in THE PATENT RECORD, an illustrated and widely circulated journal, consulted by Manufacturers and Investors.

Send for sample copy **FREE.** Address,

VICTOR J. EVANS & CO.,
(Patent Attorneys,)
Evans Building, - WASHINGTON, D. C.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS. Agent and Patentee, **161 Grand Street. Rahway, N. J.**

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

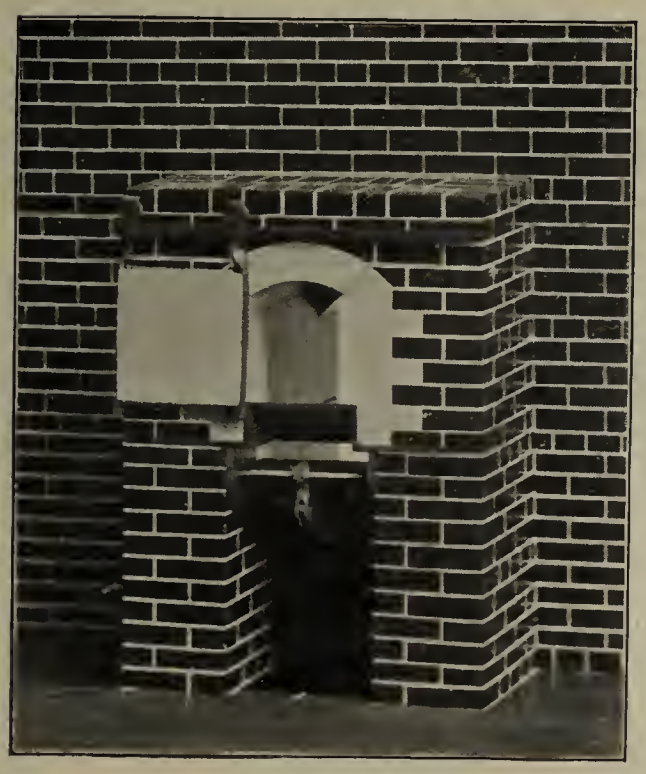
Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } **Chenoa, Ill.**

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.



For **uniformity** in **burning, hardness** of **ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump,** and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write

J. ST. KOSLOWSKY, Industrial Agt., St. Louis, Mo.
or
E. W. LABEAUME, G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western RAILWAY.

Short line between **INDIANAPOLIS** and **KANSAS CITY.** The **only line** running **Reclining Chair and Sleeping Cars** between **CINCINNATI** and **INDIANAPOLIS, DECATUR, SPRINGFIELD, JACKSONVILLE, HANNIBAL** and **QUINCY.**

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	4.05 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent. Indianapolis, Ind.

LAKE ERIE & WESTERN RAILROAD. NATURAL GAS ROUTE

Solid Train Between

Sandusky and Peoria

—AND—

INDIANAPOLIS and MICHIGAN CITY, FT. WAYNE and CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

	Depart.	Arrive.
Toledo, Chicago and Michigan, ex	†7:00 am	*10:25 am
Toledo, Detroit and Chicago lim	*12:20 pm	†4:15 pm
Muncie, Lafayette and Laporte, spec	†7:20 pm	†10:25 pm

*Daily. †Ex-Sunday.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent, Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt. INDIANAPOLIS, IND.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

R. D. CULVER, Pres. and Gen'l Man. I. G. POSTON, Sec'y and Treas.

The Wabash Clay Co.,

MANUFACTURERS OF ALL SHALE

PAVING BRICKS AND BLOCKS.

Our leading brands are POSTON BLOCK, WABASH STANDARDS, "SPECIALS," for crossings on macadam streets, GUTTER BLOCKS and COLUMBIAN SIDEWALK BRICK.

Our material has for years successfully stood the heaviest traffic of Indianapolis, Terre Haute, East St. Louis and dozens of other large cities of Indiana and Illinois. We ask investigation and comparison by those seeking the best paving material. Samples furnished on application.

Office and Works at VEEDERSBURG, IND.

Preston Brick Co.,

MANUFACTURERS OF

Vitrified Shale Paving Brick,

SEWER AND HARD BUILDING BRICK.

Hornellsville, N. Y.

T. B. McAVOY, PRESIDENT. FRANK B. McAVOY, SEC. AND TREAS.

McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA. WORKS:—PERKIOMEN JUNCTION, PENN.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades.
Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING. SYRACUSE, N. Y.

W. C. SIBLEY, PRES. J. W. SIBLEY, GEN'L. MAN.

THE COALDALE PAVING BRICK CO.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

COALDALE VITRIFIED PAVERS,
Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT, COALDALE, ALA.
TELEGRAPH OFFICE, WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

The Eastern Paving Brick Co.,

MANUFACTURERS OF THE HIGHEST GRADE

VITRIFIED PAVING BRICK and BLOCK,

For Streets and Sidewalks. Positive guarantee as to wearing qualities. Largest capacity in the East.
Correspondence solicited.

Office and Works, CATSKILL, N. Y.

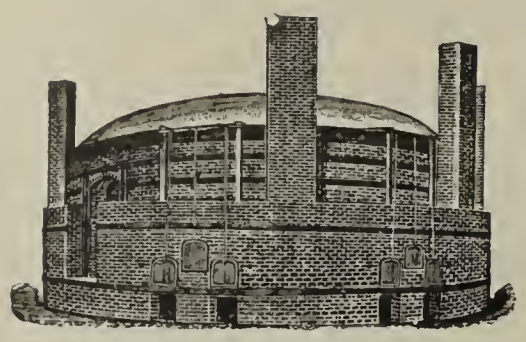
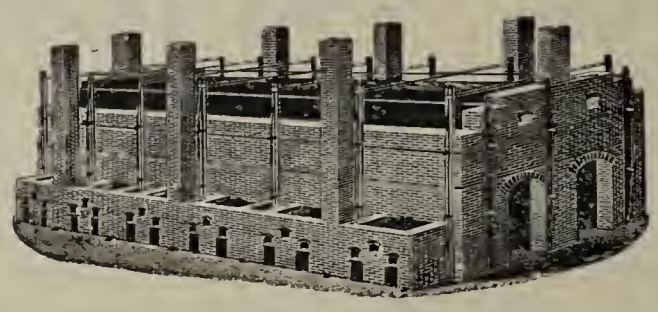
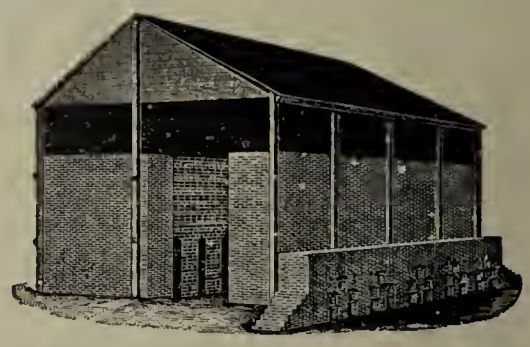
Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date.
By H. A. Wheeler, E. M.
Mailed to any address on receipt of $1.00.

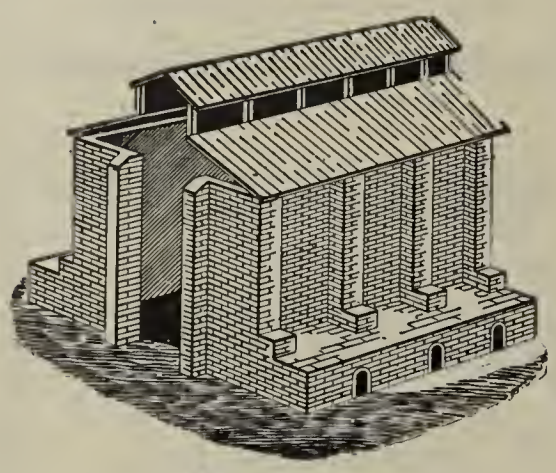
T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The Swift Slack Coal Coking Table Furnace Kiln,

Now in reach of all, both great and small.

$25.00 Will give you a chance to investigate the merits of the famous Swifts Furnaces and kilns. Write for particulars. **F. E. SWIFT, Washington, Iowa, U. S. A.**

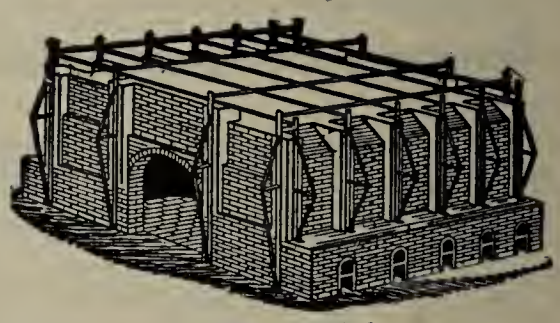


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, 2,422 Chestnut St., ***Kansas City, Mo.***

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

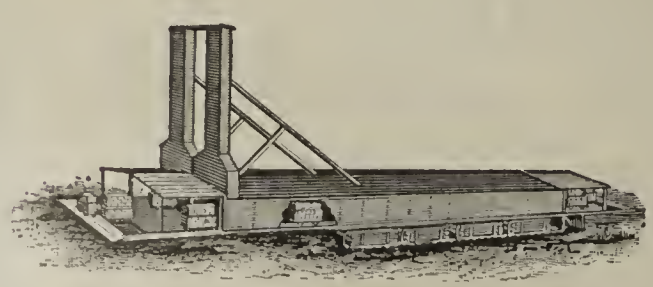
Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

A. F. BARRON,

Patentee and Builder of the

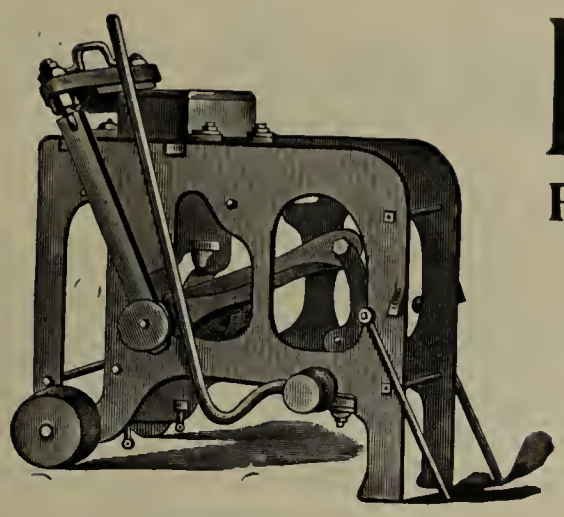
CHICAGO IRON CLAD and BARRON'S TENDER CLAY DRYERS.



These are the gradual outgrowth of a correct principle patented 28 years ago. Every year since that date has witnessed improvements that has kept this system beyond the reach of competition and we now can build Dryers to dry clay products of every grade, even if the clay is of a tender nature. The original principle is still retained. Crude methods of application displaced by money saving devices in steam fitting and construction—enabling patrons to turn out clay products of highest grade in strength and color and at a great saving in expenditure of fuel. In seeking information mention the peculiar nature of the clay, process of manufacture, etc. Address,

A. F. BARRON,

Temple Court Building. CHICAGO, ILL.



RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

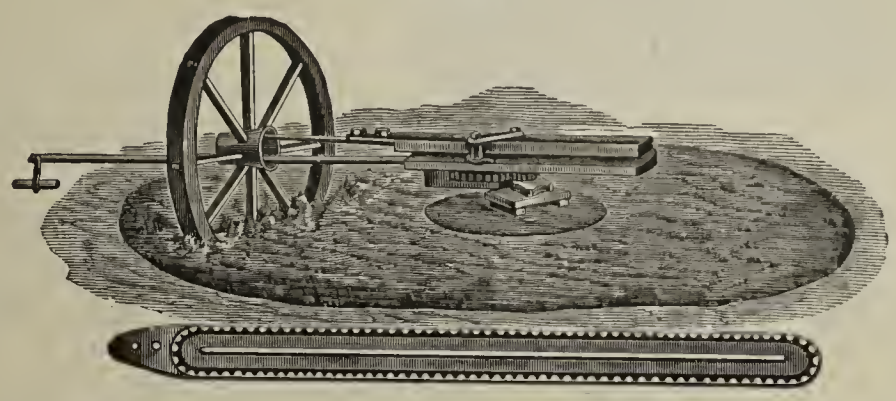
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.



☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

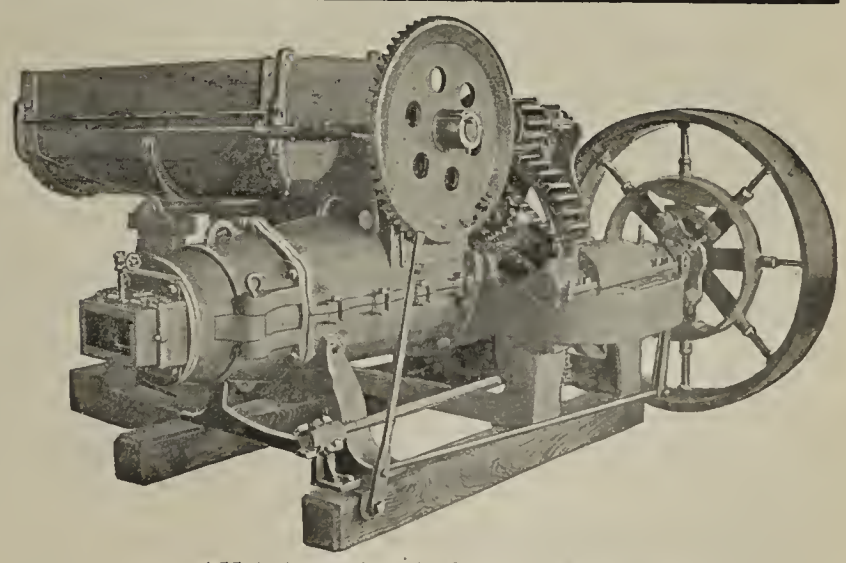
[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.

TAKE A LOOK

At this for a Combined Machine. It has the advantages of other combined machines and others besides. It does not interfere with the stiffness and rigidity of the machine "proper."

The feed end of Pug Mill is clear of all machinery. Pug Mill is hinged so it can be raised clear of Machine, leaving everything free of access.

Let us talk to you about it.



All That Could be Desired.

Kinston, N. C., March 27th, 1900.

Messrs. J. C. STEELE & SONS, Statesville, N. C.

Gentlemen:—We herewith enclose check for $—— in settlement of the brick machine, cutting table, etc., purchased of you a short time ago, for which kindly send us receipt.

The machine is working well and we are extremely well pleased with it. It is all that could be desired.

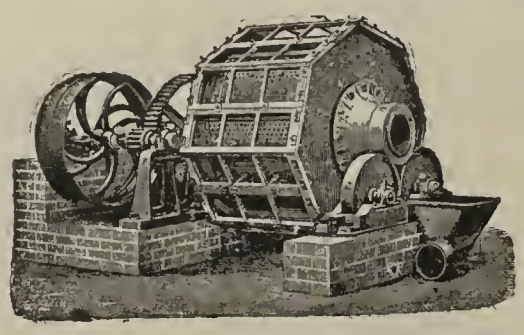
Very truly yours, L. HARVEY & SON.

J. C. STEELE & SONS,

Manufacturers of
The "NEW SOUTH" BRICK MACHINERY,

Statesville, N. C.

The SMIDTH BALLMILL.



Simplest ✻ Best ✻ Most Efficient.

CRUSHES, GRINDS and SIFTS in one Operation, Working Continuously.
Excells all others in Absolute Uniformity of Product.
Maximum Output. Slight Cost of Repairs. Low Horse Power.
SEND FOR CATALOGS.

F. L. SMIDTH & CO., Engineers,
66 Maiden Lane, N. Y.

COPENHAGEN: Vestergade 29, K.

LONDON: 9 Bridge St., S. W.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.,

of St. Louis, Mo., U. S. A.

Williams's Shale and Clay Pulverizer, With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

For further information write to

SUBURBAN BRICK CO.

WHEELING, W. VA., June 18, 1900.

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO, St. Louis, Mo.

Gentlemen:—Answering your favor of the 12th inst. We are pleased to say that the Shale reducing machine, put in our factory at Martins' Ferry, Ohio, has done good work, and in sufficient quantity for our needs, and has been very satisfactory in practice.

We have had no repairs or expense upon the machine, except for a set of new knives, during the past year, and this fact alone, when compared with the cost of keeping a grinding pan of the same capacity in repair, ought to be all the encomium or recommendation your machine needs to commend it to practical people.

Very truly yours,
SUBURBAN BRICK CO.,
Per B. F. Hodgman, Sec'y.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO., 2701-2707 North Broadway, ST. LOUIS, MO., U. S. A.

Branch Offices: NEW YORK OFFICE: Singer Building. WEST VIRGINIA OFFICE: Bramwell. PHILADELPHIA OFFICE: Stephen Girard Bldg. LOUISVILLE OFFICE: 1301 West Main Street.

Just Out.

The Second Edition of

Tables of Analyses of Clays,

By ALFRED CROSSLEY.

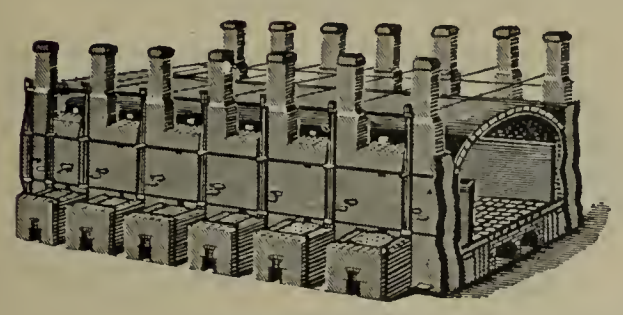
This valuable book has been carefully revised and enlarged to twice the size of the original edition. Among a large number of new analyses is included the leading **Paving Brick Clays and Shales** of America. For purposes of of comparison this work is invaluable, and should find a place in the library of every clayworker. It is handsomely bound in Morocco and will be mailed postage prepaid to any address on receipt of price, $1.00.

T. A. RANDALL & COMPANY,

PUBLISHERS,

INDIANAPOLIS, INDIANA, U.S. A.

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Streator, Ill., October 3, 1900.
M. M. BUSHONG, Esq.,
Phoenixville, Pa.

Dear Sir:—Answering yours of September the 27th, we have been using one of the Bushong Down Draft Kilns the past fifteen months and are well pleased with it. We get a larger percentage of No. 1 pavers with a little less fuel than any other kiln on the yard.

Yours truly,
THE BARR CLAY CO.,
Per C. C. Barr, Treas.

BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.

These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

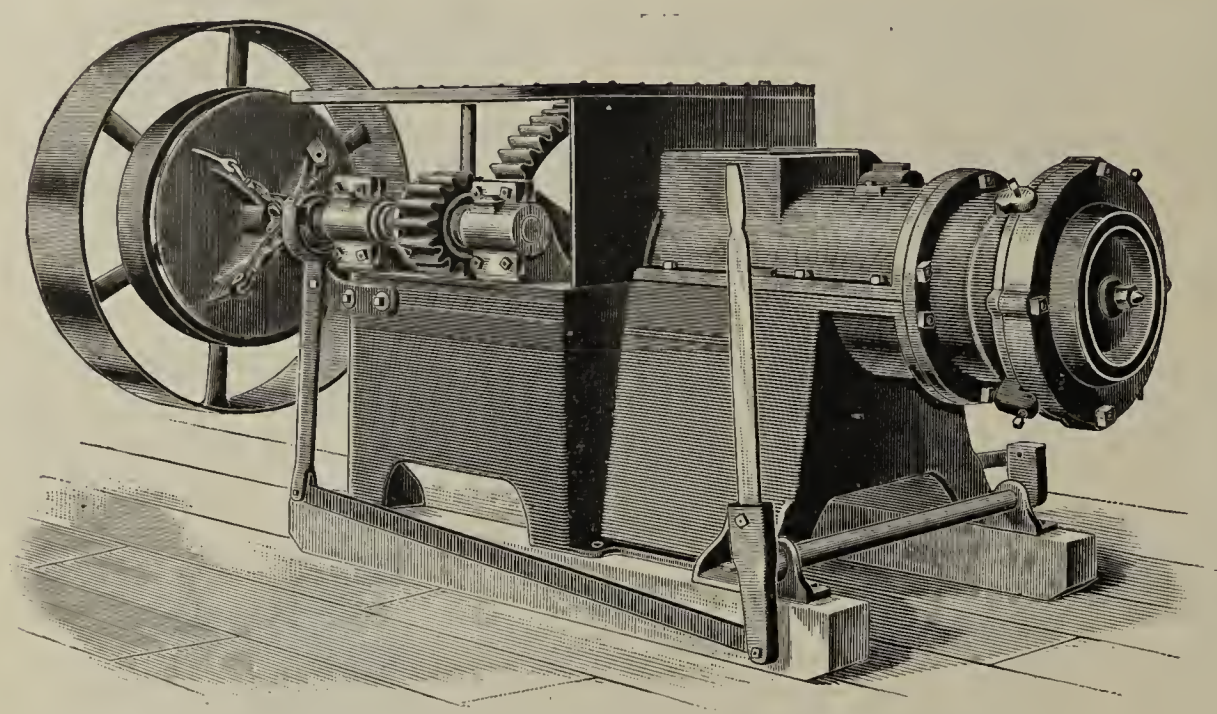
The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

HIGHLY PLEASED.



LEADER No. 25 with Drain Tile Die Attached.

OFFICE OF
STICH BROTHERS
MANUFACTURERS OF
Drain Tile and Brick.
O. M. STICH, Manager.

Livermore, Ia., August 6th, 1900.
LEADER MFG. CO.,
Decatur, Ill.

Gentlemen:—We have been using the Leader Tile and Brick Machine since March 1896 and thus far it has proven satisfactory in every way. We can make from 25,000 to 30,000 brick per day, and tile in proportion, and they are all that can be desired.

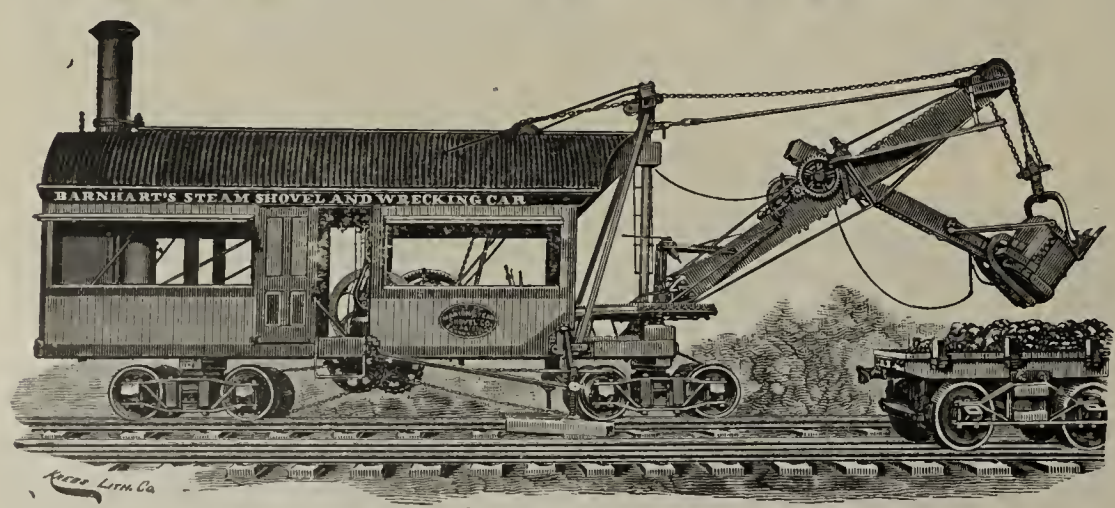
We are HIGHLY PLEASED WITH the MACHINE AND RECOMMEND IT AT ALL TIMES.

Yours truly,
STICH BROTHERS.

Our new Catalogue is ready for you.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

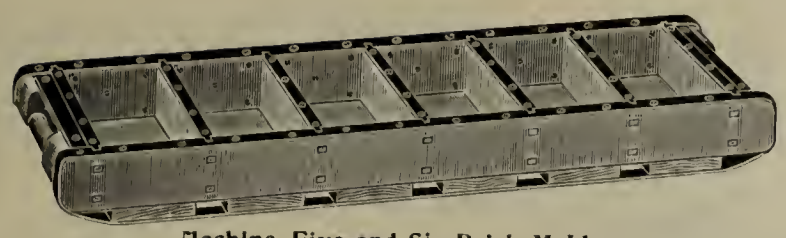
OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

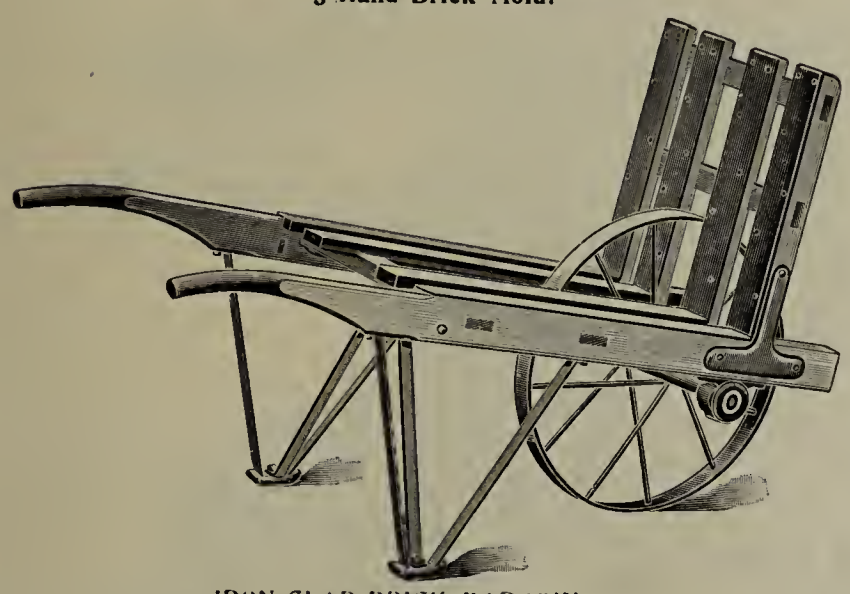
The Marion Steam Shovel Co.,
603 West Center Street, - MARION, OHIO.



Machine, Five and Six Brick Mold.

6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

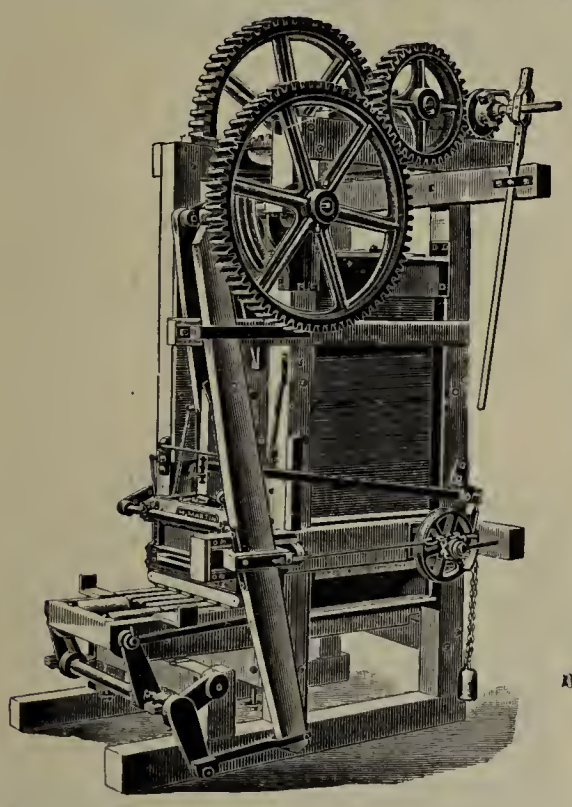
BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

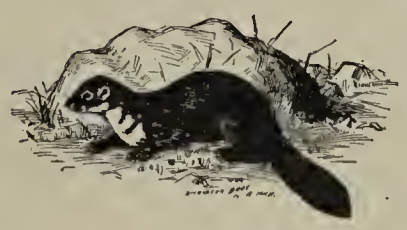
D. J. C. ARNOLD,

New London, O.



The "MARTIN"

BRICK MACHINERY.



BRICKYARD SUPPLIES.

MANUFACTURED AND SOLD ONLY BY

The Henry Martin Brick Machine Mfg. Co.,

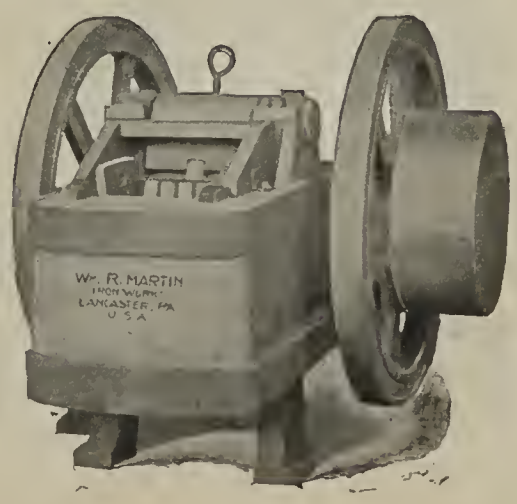
Lancaster, Pa., U. S. A.

☞ Do You Have Our Catalogue No. 40?
If not, be sure and send for it.

Everything a Brickmaker Needs.

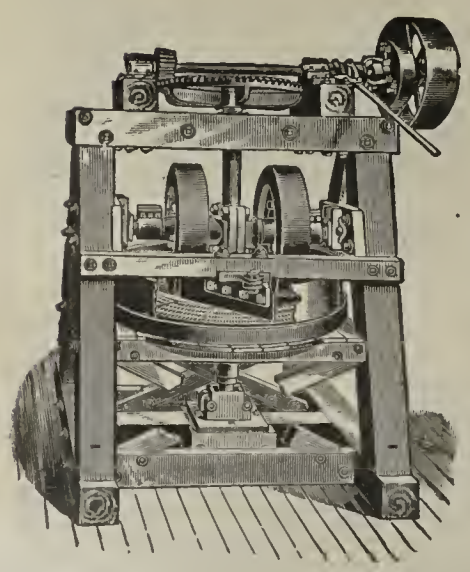
BRICK MACHINERY,
DISINTEGRATORS,
ROCK CRUSHERS,
DRY PANS, Etc., Etc.

- MOULDS,
- BARROWS,
- TRUCKS,
- KILN CASTINGS.



We Equip Complete Brick Plants.

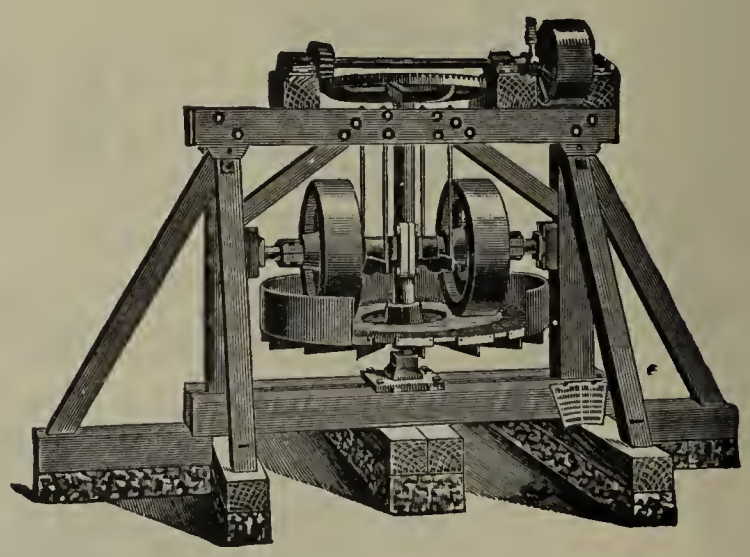
OUR SPECIALTY IS **DRY PANS.**



IRON FRAMES,

WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

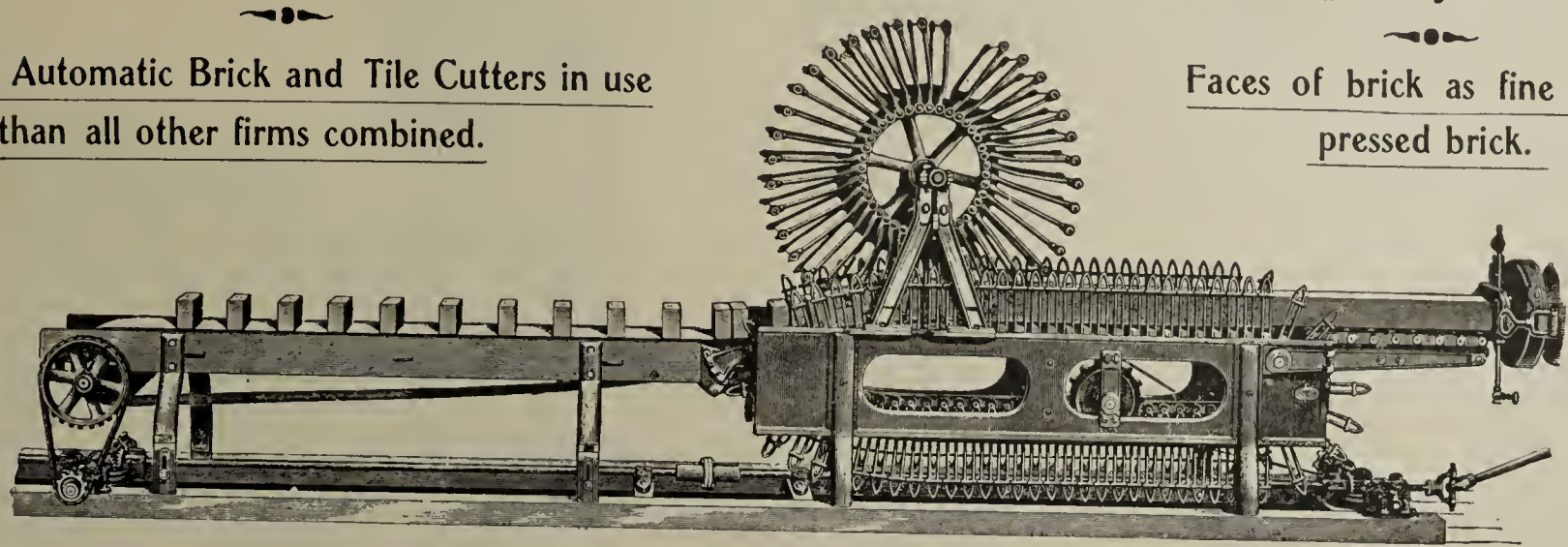
FROST ENGINE CO., Galesburg, Ill., U. S. A.

PROGRESSIVE BRICK MAKERS

Are not easily deceived. They know the value of **points** like these—**Strength, Endurance, Reliability,** no "break-down," no "lay-off," but **every day** full capacity of **brick of guaranteed quality.**

More Automatic Brick and Tile Cutters in use than all other firms combined.

Faces of brick as fine as re-pressed brick.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Lancaster, Ohio, June 25th, 1900.

J. D. FATE & CO., Plymouth, Ohio.

Dear Sirs:—I presume you are wondering how we are coming on with Brick Table. Well, we are cutting brick all right. We had to reverse the motion to suit the mill, a thing I did not think of when ordering, aside from that we made no other change. We have made about 100,000 brick since setting up table, and are more than satisfied with it. If it continues to do good work as it does (and I feel sure it will) I would not part with it under any consideration if I could not get another.

Inclosed you will find my check for balance due you, and accept my thanks for your efforts in interesting me in the table.

Respectfully, W. B. HENRY.

Montreal, Canada, May 3rd, 1900.

J. D. FATE & CO., Plymouth, Ohio.

Gentlemen:—The Automatic Side-cut Table we purchased from you has now been running three weeks and is giving the best of satisfaction, I had a little trouble the first few hours in getting it adjusted, as well as from everything being new and stiff. As soon as it got limbered up we had no trouble. It does not take one tenth the oil our old table used. We have not yet tried the belt for large sized brick; however, I do not anticipate any trouble from that source. Your table will cut any clay when it does ours so successfully, as our shale is very hard to reduce to powder, therefore, it is very coarse and very short. We have made no mistake in putting in your table. We are making 45,000 to 50,000 brick per day, and as far as the table is concerned it is only limited to the capacity of the Brick Machine, and needs no expert to run it. We will be quite willing to show your table to any one that may visit us for that purpose, as I hope to make 100,000 per day this season.

LA PRAIRIE BRICK CO.
WM. BAILLIE, Supt.

The manufacturers of this table do not guarantee it to do as good work as any other, but BETTER WORK—they guarantee it to deliver on the off-bearing belt, better, smoother faced, sharper edged brick than can be produced by any other brick cutter ever made.

A full line of "Stiff Mud" Brick Machinery.
Also "Soft Mud" Brick Machinery, both Steam and Horse Power.
Write us for Catalogue of the **best** brick machinery built.

J. D. FATE & CO.,

Manufacturers of

BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.
Agent for Virginia and North Carolina: H. L. JACOBS Suffolk, Va.

HALF AN EAGLE REPRESS

Is better than a whole repress of some other make.

This may sound a little strong, but it is a fact.

The Eagle Repress is a machine that is in every way worthy of the extended praise it has received the world over. It is built to run without repairs and it does it. Other machines cost heavily for repairs but the Eagle doesn't.

The Eagle is a double-mold machine, and if you run half of it—or in other words—if you use only one mold—you still get as good or better results, day in and day out, as you would on some other represses.

FIRST—You get better brick, every one being perfect.

SECOND—You can alternate between the use of molds without injury to the machine. You couldn't do this on other machines.

THIRD—The repairs on an Eagle are practically nothing, while on other machines they are a serious item.

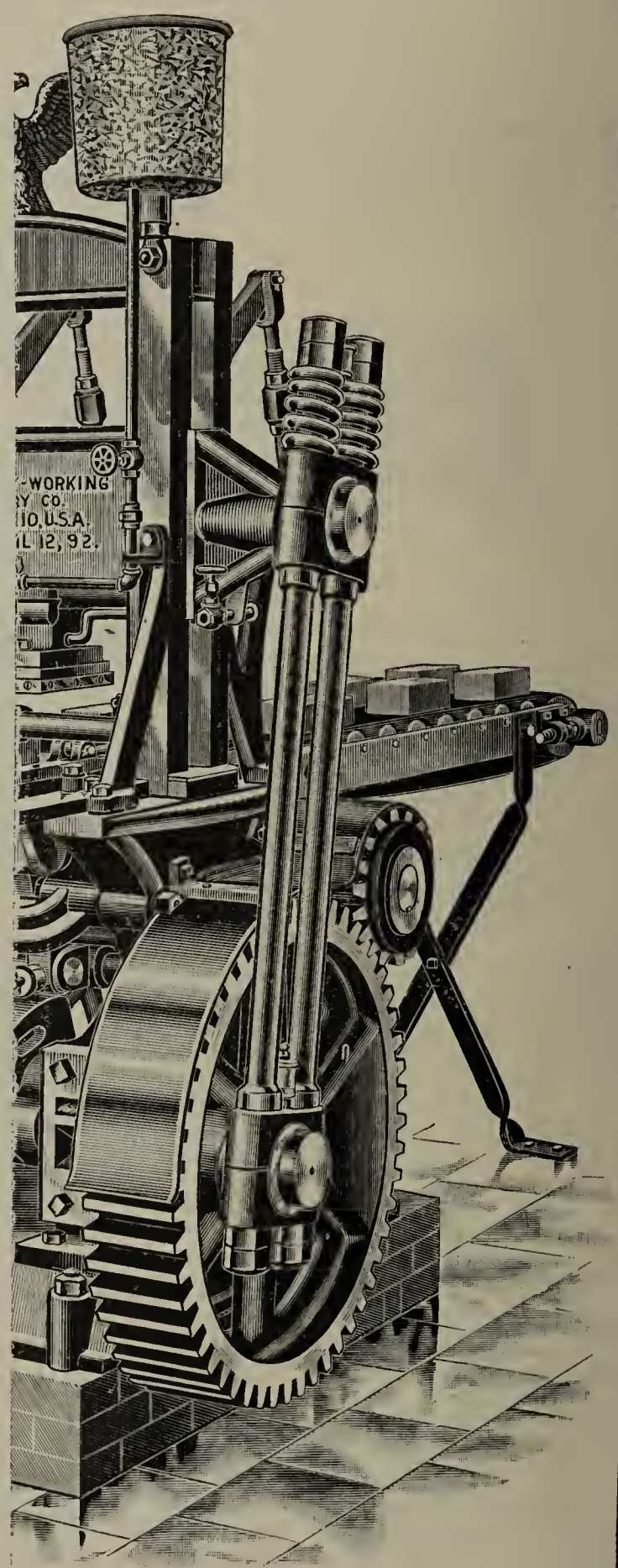
FINALLY—To sum the whole matter up in a nut shell

The Extra Speed of the Eagle,
The Saving of Repairs on the Eagle,
The Extra Quality of the Product.

Lead us to re-assert that "Half an Eagle Repress is better than a whole repress of some other make."

To tell of all the good points of The Eagle Repress requires a book. We have it. It's yours if you'll write and ask for it. In it we tell of a lot we know about The Eagle. We build it and know its quality. In it the Clayworkers who are using The Eagle tell what they know about it. They use it and know what it will do. Isn't such a book worth writing for? Write today, tomorrow never comes.

We build a full line of Dry Press, Stiff Mud and Soft Mud Machinery. They're "Built Right and Run Right."



HIGHEST AWARD AT THE PARIS EXPOSITION.

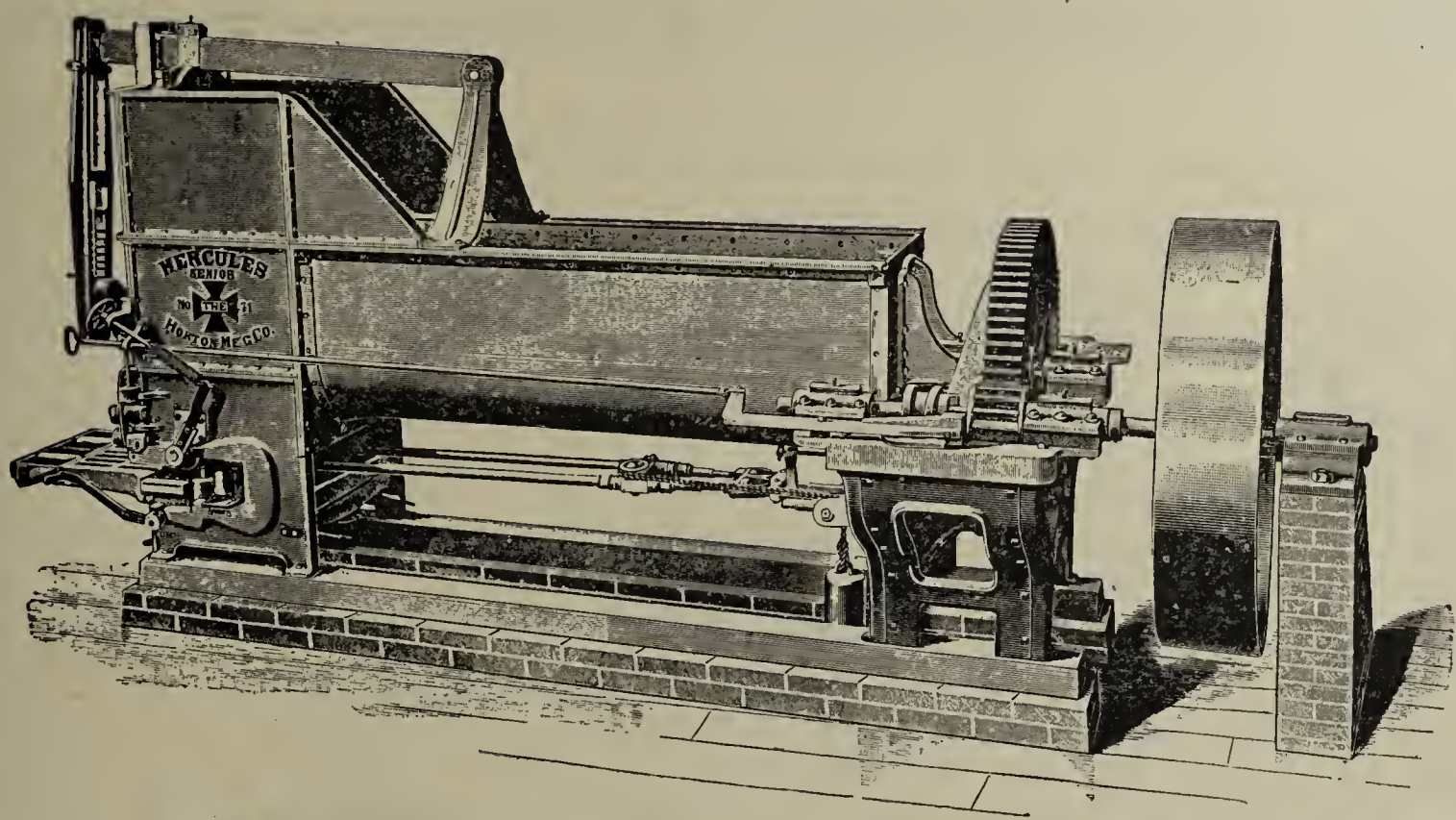
The American Clay-Working Machinery Company,

BUCYRUS, OHIO, U. S. A.

NEW YORK OFFICE, 39 and 41 Cortlandt St.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES

IRON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brickyard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

Now Will You Be ....Good....

ONCE MORE the **Potts Patents** on **Clay Disintegrators** are delared to be good and valid. That all machines using adjustably securedor solid bars cast to the roll, are infringements of the Potts Patents.

It is now only a matter of a short time until all manufacturers of these infringing machines will be prohibited from manufacturing or selling the same.

Don't let this trouble you as **C. & A. Potts & Co.,** are still in the business, and will furnish all the Disintegrators wanted. You will never have to go back to the old and expensive rolls.

The manufacturers of these infringing Disintegrators have the past six years told you the Disintegrator was the machine for you to use, if this was the case then it must be so now.

Remember the Disintegrator is the only machine ever made that will work any kind of clay direct from the bank and not choke or clog—it will grind the small stones and separate the large ones, it does not pack the clay into thin hard sheets, but leaves it in a loose open condition, so it will take water quickly and is easily pugged. It saves labor and improves the quality of Brick or Tile.

For prices write

C. & A. POTTS & CO.,
Indianapolis, Ind.

CHAMBERS BROS. CO., Philadelphia, Pa.,
Are the only Licensed Manufacturers.

BRICK MANUFACTURERS CANNOT AFFORD TO IGNORE THE SPLENDID QUALITIES OF THE CLAYWORKING MACHINERY MANUFACTURED BY **C. & A. POTTS & CO.**

Horizontal Stock Brick Machines, All Iron or Wood Frame.

PUG MILLS, DISINTEGRATORS, MOULD SANDERS, and all Brick-yard Supplies.

They have invariably become recognized leaders in every locality, invincible in the yards and in all contests, winning their way by fine work and lasting qualities and positive economy. They are up-to-date, progressive machines, with all the latest improvements. Well Built, Strong and Durable.

There have been more Potts Machines sold this season than ever before fully one-half of which have gone to yards to replace machines which were sold last season because they were "just as good" as the Potts, and cheaper.

Reese-Hammond Fire Brick Company.

Capital Stock $500,000. **Annual Capacity, 50,000,000.**

C. & A. Potts & Co., Indianapolis, Ind.

Bolivar, Pa., June 26, 1900.

Gentlemen:—We have your esteemed favor of the 22nd, in reply we are pleased to state that the reports we have received from your machine are most gratifying. From the reports of our superintendent the results are entirely satisfactory, and we can assure you that it gives us great pleasure to be able to make such a report to you.

Yours respectfully,
Reese-Hammond Fire Brick Co.

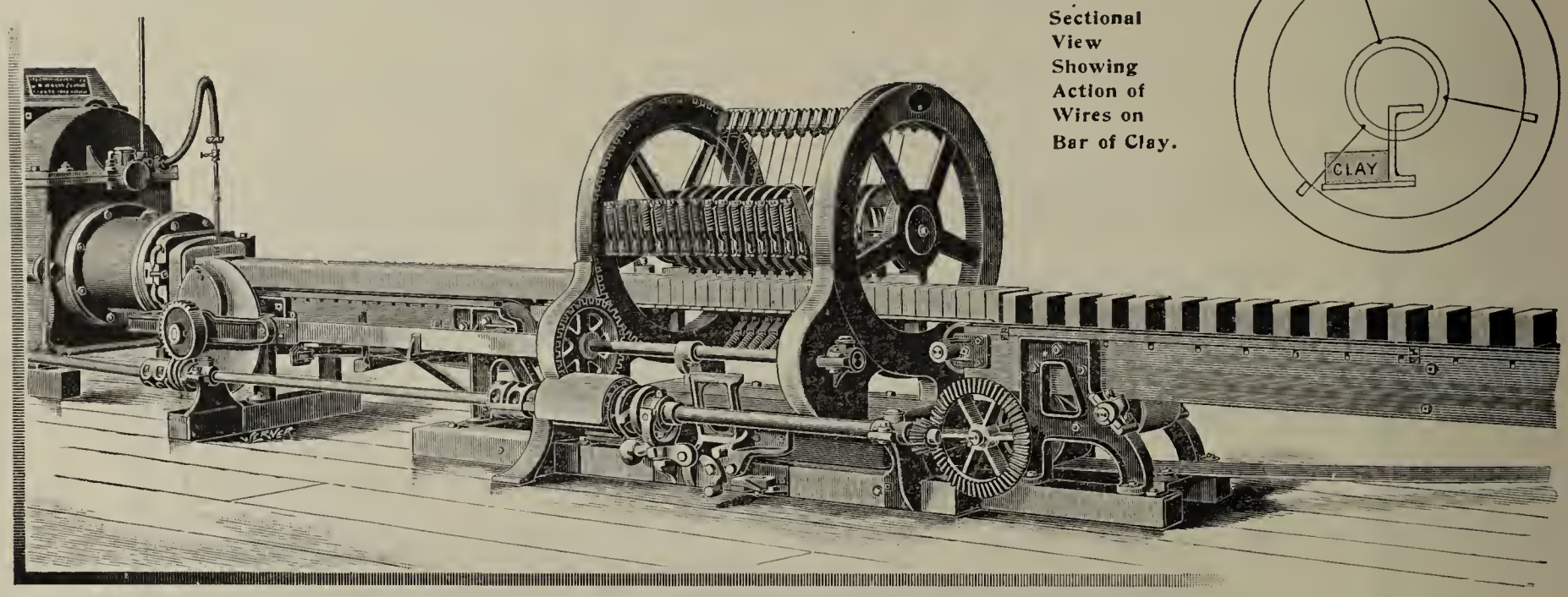
THE ABOVE LETTER IS FROM A VICTIM WHO TRIED ONE OF "THE JUST AS GOOD" MACHINES LAST SEASON. LET US TELL YOU WHY THEY MADE THE CHANGE.

C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE

INDIANAPOLIS, IND.

Merit Wins Success.



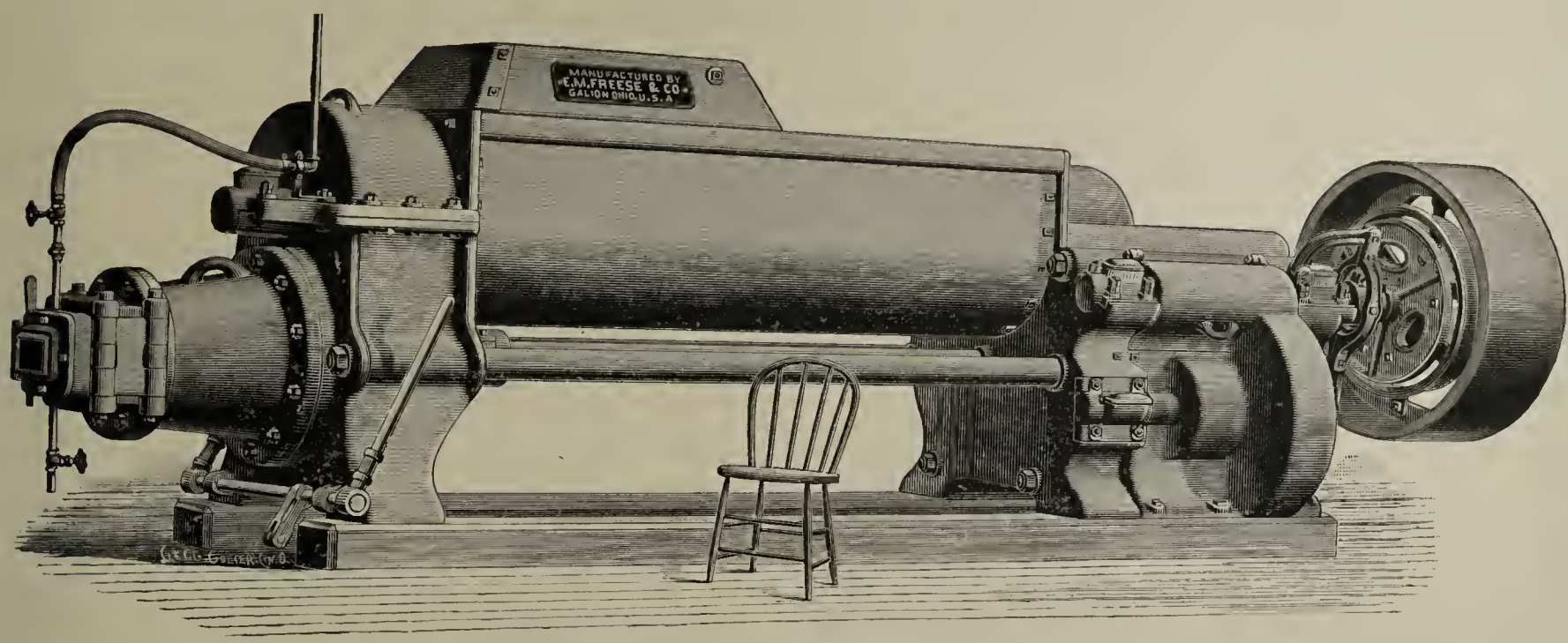
These Cutters have been Adopted by a Large Number of the Most Prominent Brick Manufacturers.

OUR AUTOMATIC SIDE CUTTER is a radical improvement over all other cutters. No slip belts or auxiliary power used. Movements are positive. Brick are cut true and of uniform thickness. They compare favorable with repressed brick. You will be pleased with the apparatus if you see it in operation.

Let us refer you to the nearest user.

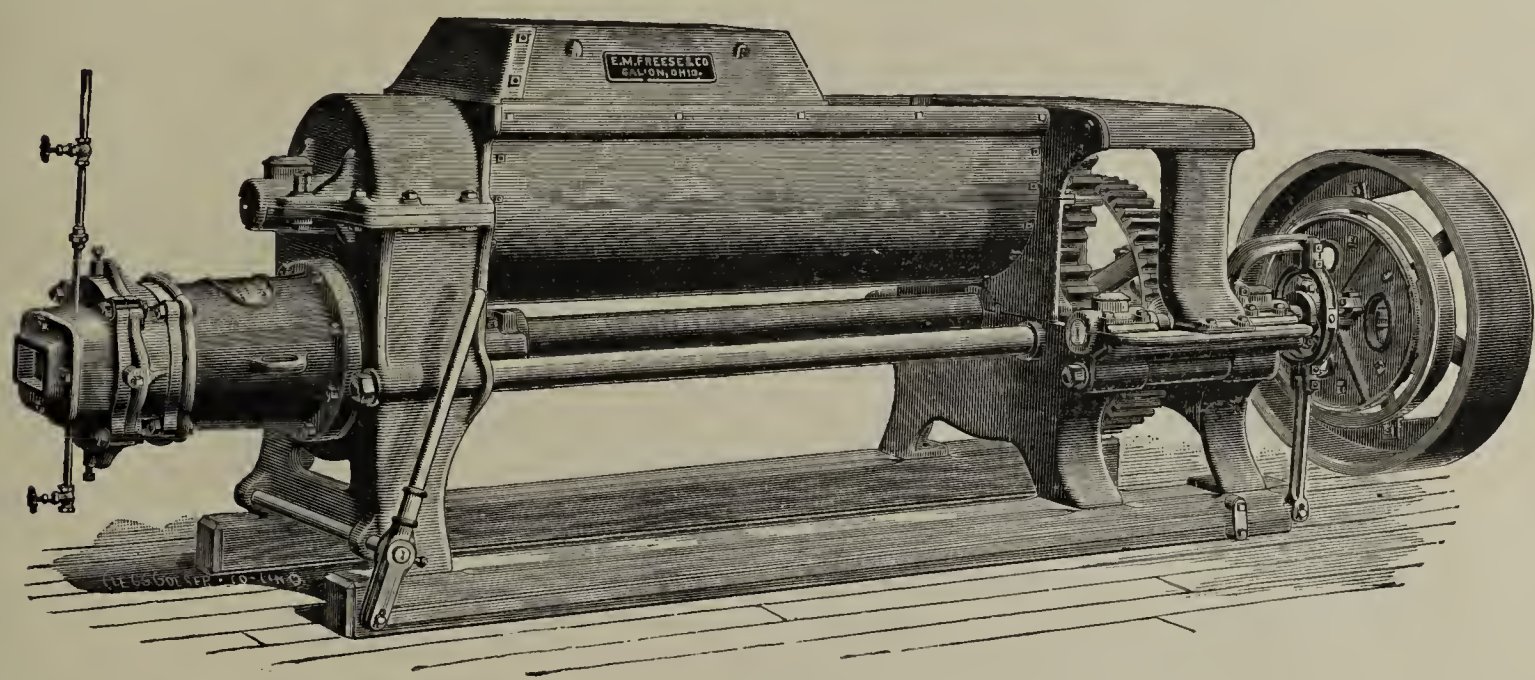
E. M. FREESE & CO.,
Galion, Ohio.

In Union There is Strength.



SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.

We are the originators of the "Union" Brick Machines.

When we combined a Pug Mill and a Brick Machine into one Machine we added strength and durability to both.

Weight, Strength and Durability means long life and less repair bills.

We build the "Union" Machines in four sizes.

No separate Pug Mill required. No clogging in Hopper, no overflow of clay, no litter.

We want to help you investigate. Ask no questions.

Addresses of customers on request.

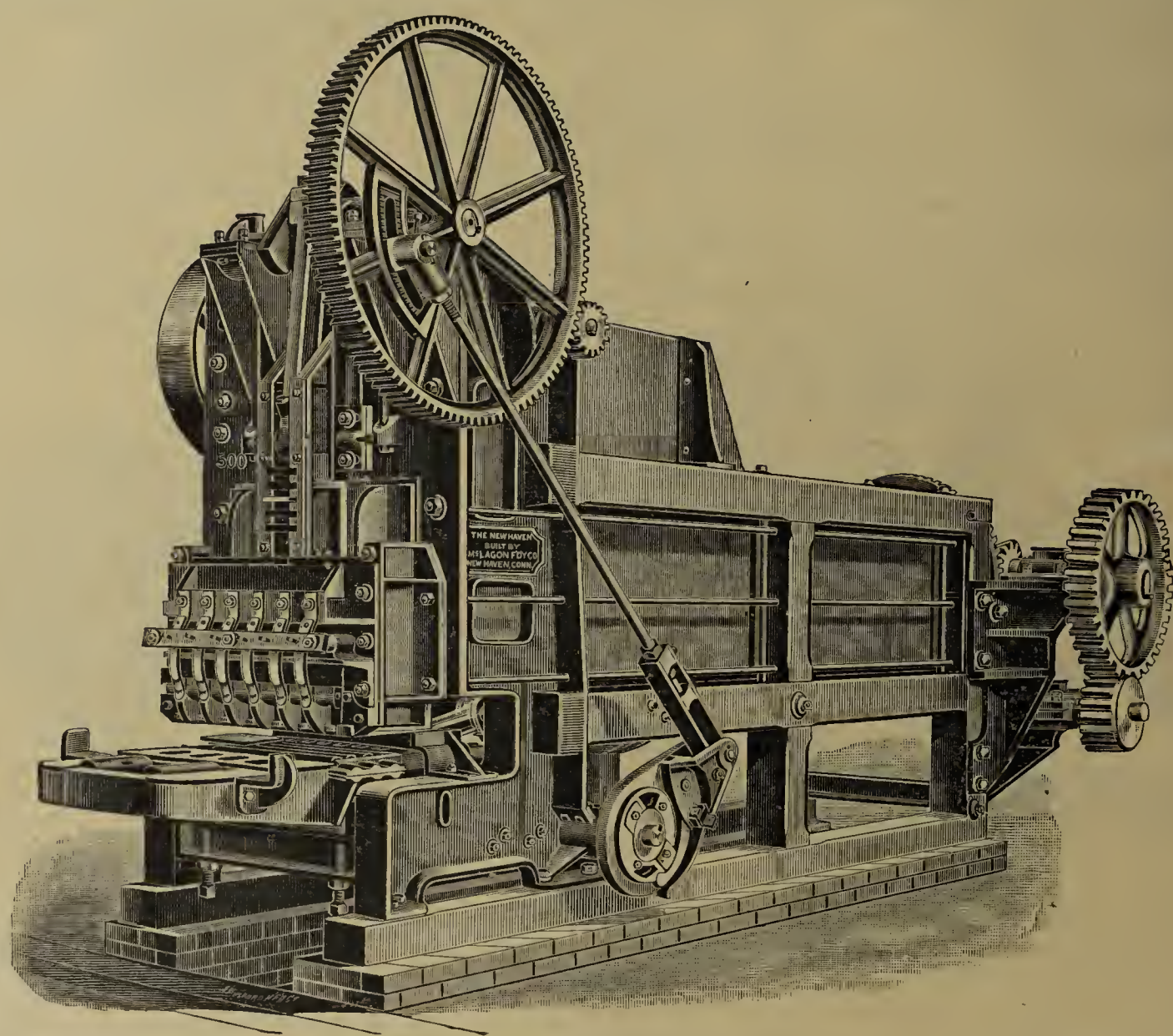
E. M. FREESE & CO.,

Galion, Ohio.

"We are very well pleased with the machine, we can assure you. It makes as many brick as our force can handle in a day, does it better than any other machine we have seen and is always ready for work."

THIS QUOTATION IS FROM A LETTER RECEIVED RECENTLY, AND IS AN UNSOLICITED EXPRESSION OF SATISFACTION WITH THEIR

"New Haven" Machine.



Note that they say it "is Always Ready for Work." That is the usual condition of "New Haven" Brick Machines, and is due to their great strength and thorough construction.

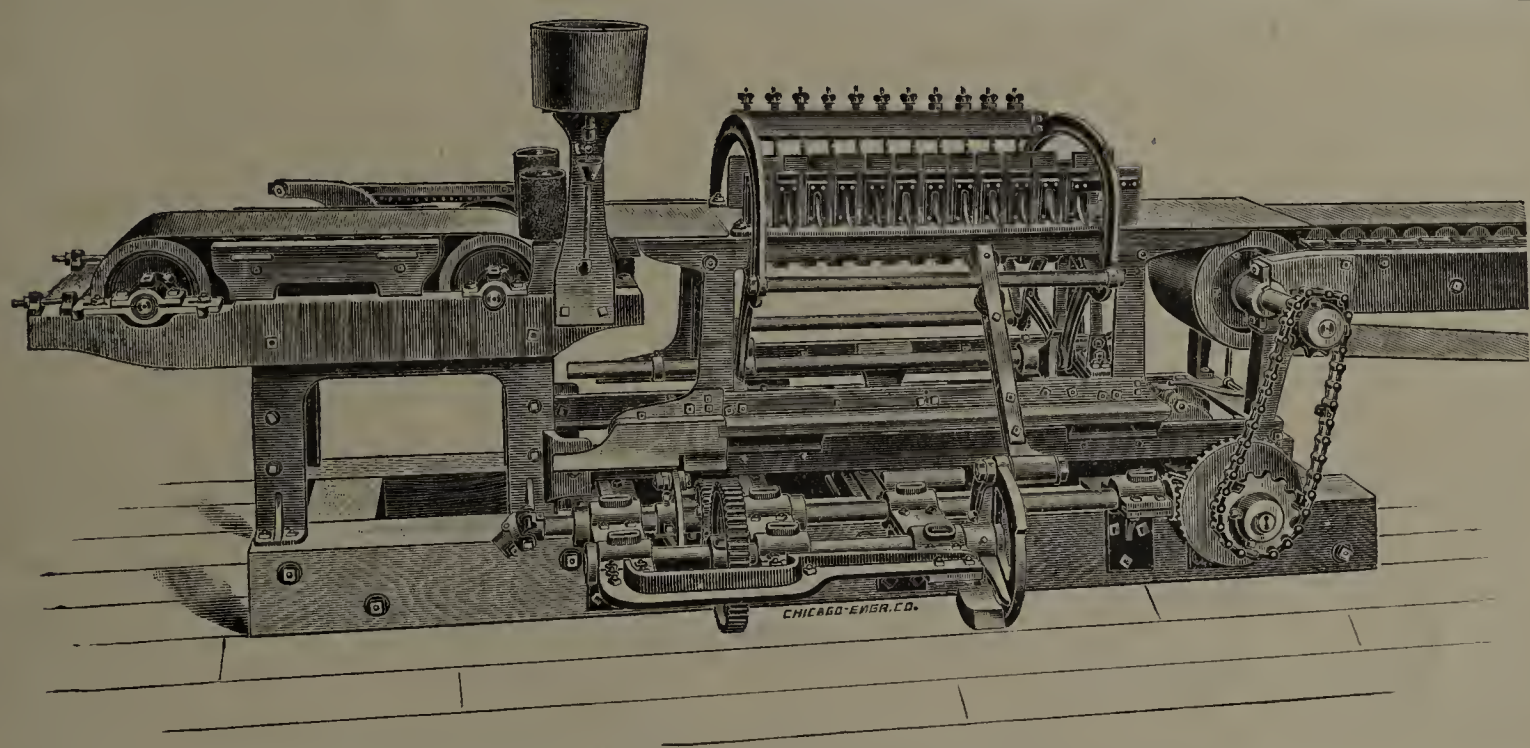
Better inquire about these machines of

The Eastern Machinery Co.,

NEW HAVEN, CONN.

If a Brick is Warped

Out of shape when it is dry and burned how much do the nice, clean cut edges which that brick may happen to have amount to? Very fine edges on a very crooked brick would be something like very handsome tail feathers on a goose. What you need then, is a **combination** of fine edges, square brick and the machine to cut them that way.



The BREWER No. 60 AUTOMATIC CUTTER.

We can furnish the machine part of the combination in our **No. 60 Automatic Cutter.** Let your brick warp if they want to; they'll be straight when dry if cut on this machine. Quiet, accurate, simple, durable and built upon the proper plan. Column of clay does nothing but measure itself. Let us tell you more about it.

Information and Catalogs for the asking.

H. BREWER & CO., Tecumseh, Mich.

The Purington Paving Brick Co., Galesburg, Ill., write:

"We have been using two of your blowers, one 160" and one 140", for the last three months, and we can recommend them most highly. We are drawing hot air with them from kilns that have been burned and exhausting it into our dry houses, taking out every 24 hours 225,000 lbs. of moisture, and are doing it much better than any other method of drying we have ever tried. The fans are perfect in every way—have never had a hot box or a delay on account of the fans since we started them, and we run them continually, except Sundays."

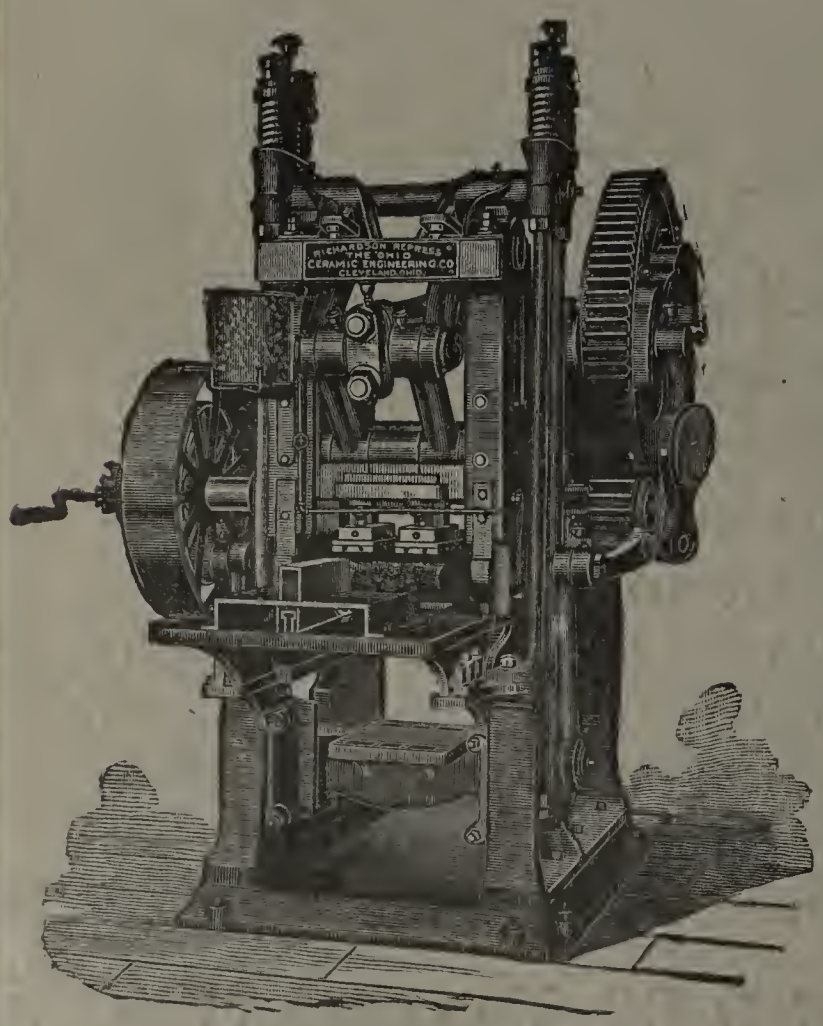
American Blower Company,
Detroit, Michigan.
New York. Chicago. London.

A FEW COLD FACTS.

WE HAVE from time to time during the years we have been in business made many changes in the construction of our Sewer Pipe Press. Each time these changes have created among other manufacturers a strong protest of—**no good—it won't work**, and yet in a short time they were all trying to attain the same end. They copy **the best** because it is ahead in the procession. This fact alone should convince you that the **Vaughn Press** is up-to-date. Do you want the best Press or do you want to stay in a rut and use Grandfather's method? Better have a talk with us and make money.

The Turner, Vaughn & Taylor Co.,
CUYAHOGA FALLS, OHIO, U. S. A.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



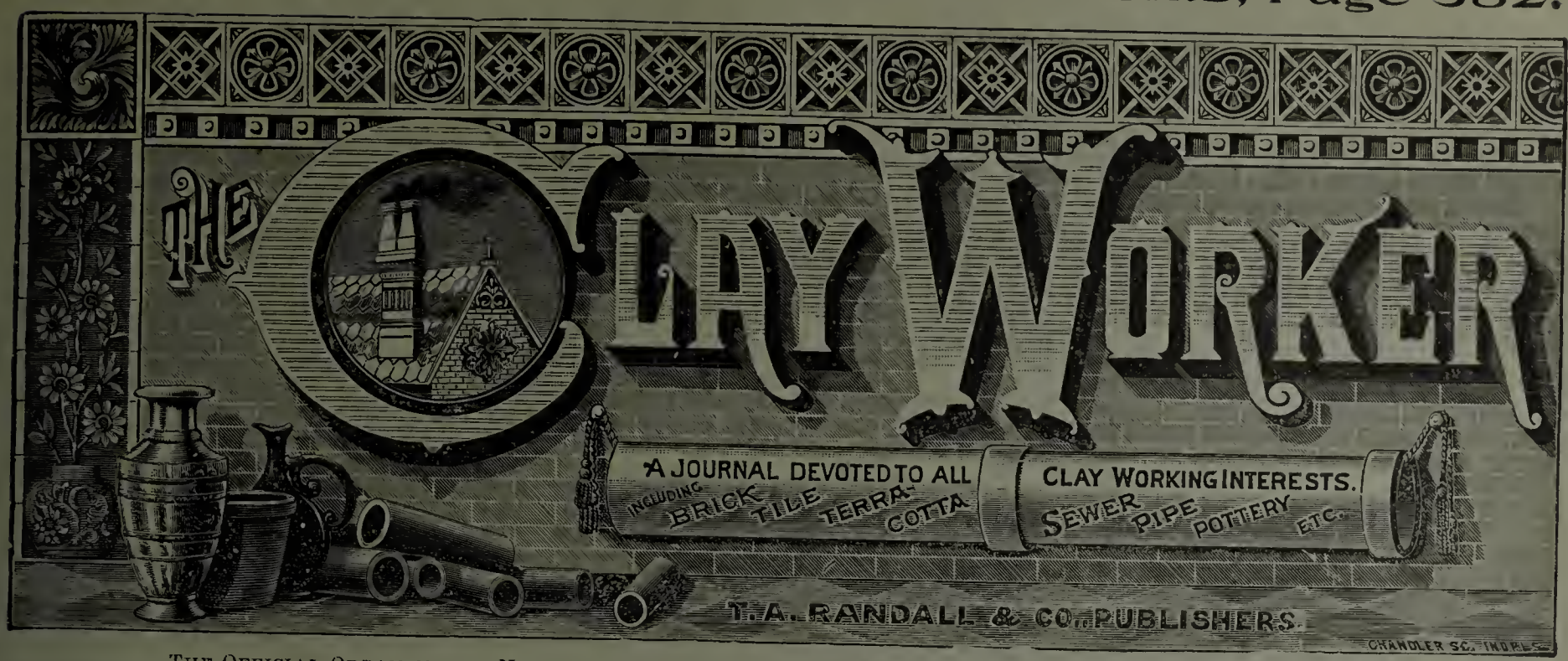
The RICHARDSON REPRESS.

IF YOU GIVE THEM A CHANCE, OUR REPRESSES AND OTHER MACHINES WILL SPEAK FOR THEMSELVES AND FOR US. SEND FOR CATALOGUE.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

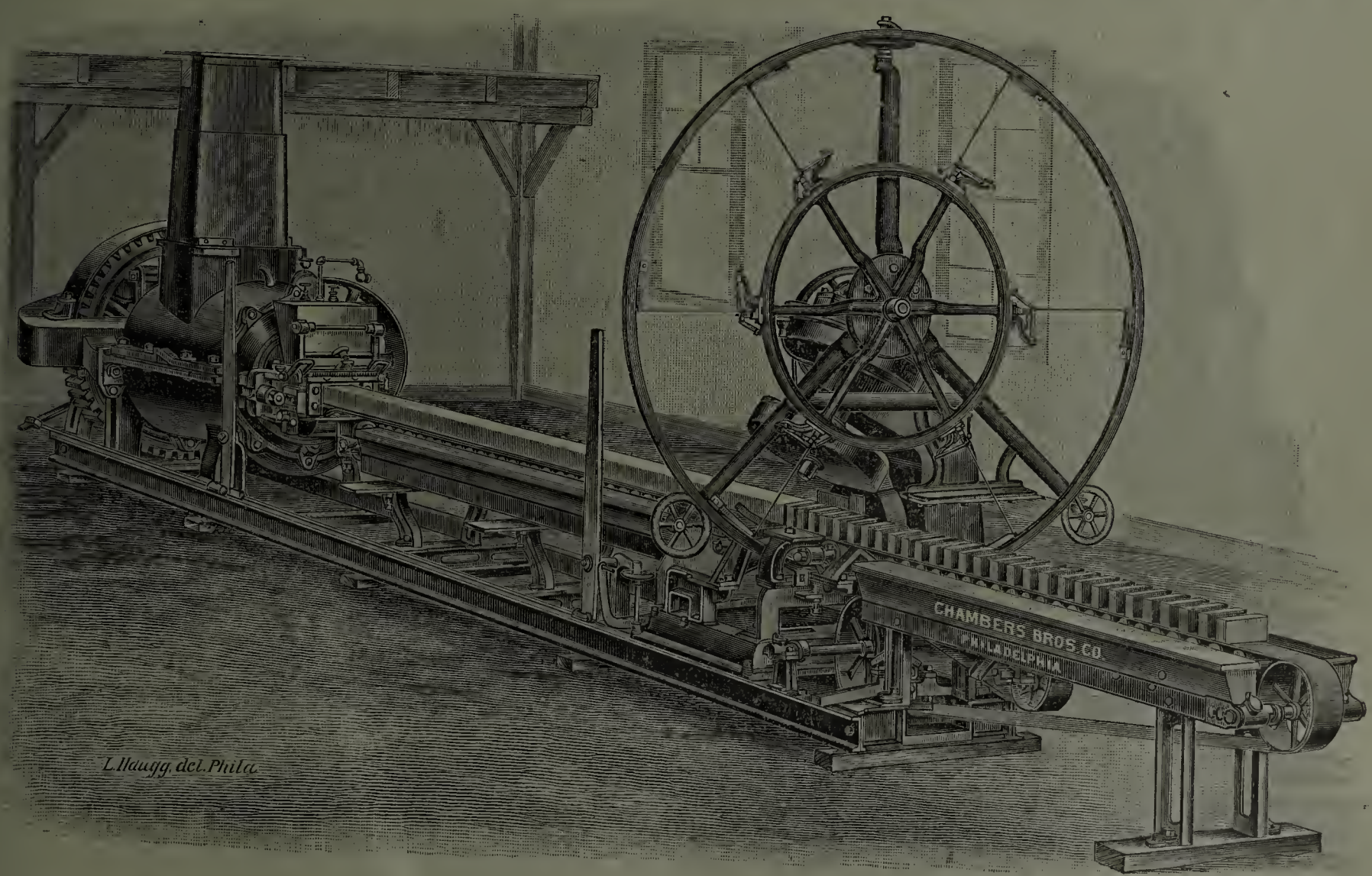
Table of Contents, Page 382.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIV, No. 5. INDIANAPOLIS, IND. NOVEMBER, 1900 $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

PHILADELPHIA, PA.

J. E. EASTES, Chicago Agent,
171 South Canal Street.

The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

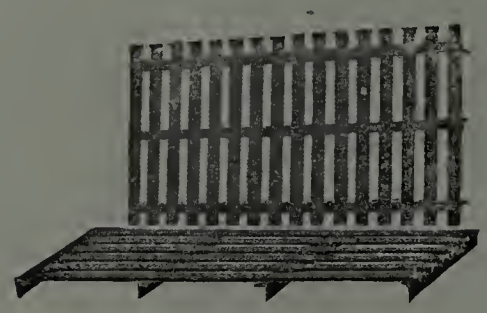
We are the Largest Manufacturers of Dryer Cars in the World.

Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.

No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

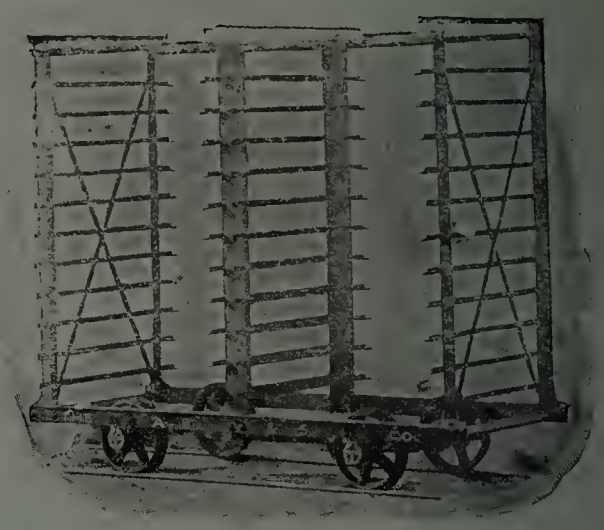
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name. Page.

American Clay-Working Mach Co, The. 407 410
Anderson Foundry and Mach. Works 341
Chicago Brick Machinery Co.. 405
Chisholm, Boyd & White Co... 341
Fernholtz Brick Machinery Co. The 345
Progress Press Brick and Machine Co..... ..
Ross-Keller Brick Machine Co 342
Simpson Manufacturing Company The..... 343

Brick and Tile Machinery.

American Clay-Working Mach Co., The 407 410
Anderson Foundry and Mach. Works..... 340
Baird and Son, H. C..... 394
Battenfeld Mfg. Co, The 389
Brewer. H. & Co..... 419
Chambers Brothers Co..... 337
Chicago Brick Machinery Co... 405
Eastern Machinery Co, The.... 418
Fate & Co., The J. D..... 412
Freese, E. M. & Co..... 416, 417
Henry Martin Brick Mach. Mfg Co, The 411
Hensley, J. W..... 339
Horton Mfg Co, The 413
Kells Foundry and Machine Co..... 394
Leader Mfg. Co, The..... 406
Madden & Co..... 393
Ohio Ceramic Engineering Co., The..... 420
Potts & Co., C. & A.....414, 415
Raymond Co., The C. W..... 383
Stedman Foundry and Machine Works..... 345
Steele, J. C., & Sons..... 404
Wallace Mfg. Co, The..... 408
Wellington Machine Co, The... 385
Wiles Co., A. M. & W. H 404

Brick Kilns and Dryers.

Alsip, S. H 399
American Blower Co, The..... 336
Barron, A. F 402
Bushong, M. M 403
Crown Dryer Co., The..... 387
Eudaly, W. A 403
Haigh, H 402
Illinois Supply and Construction Co, The..... 344
Morrison & Co., R. B 395
New York Blower Co., The.... 420
Phillips, S. G..... 399
Pike, E. M..... 399
Reppell, L. H 402
Swift, F. E 402
Standard Dry Kiln Co, The..... 346
Yates, Alfred..... 396

Brick Yard Supplies.

Atlas Bolt & Screw Co, The..... 338
Arnold, D. J. C 405
Borden & Selleck Co 392
Buhl Malleable Company..... 393
Cleveland Car Co..... 398
Caldwell & Son Co., H. W..... 397
Carmichael, T. W..... 391
Carnell, Geo..... 404
Cox, Geo. S..... 394
Elder & Dunlap..... 396
Frost Engine Co..... 409
Harrington & King Perforating Co, The 339
Henry Martin Brick Machine Mfg. Co, The..... 411
Horton Mfg. Co, The..... 413
Jeffrey Manufacturing Co, The. 397
Kendall & Flick..... ..
Marion Steam Shovel Co..... 406
Main Belting Co 392
Mershon & Co., W. B 391
Newton, A. H..... 397
Newton A. C..... 395
Phillips & McLaren 395
Rockwood Mfg. Co, The..... 393
Smidth & Co., F. L..... 391
Turner, Vaughn & Taylor Co... 420
Vanduzen Co., The E. W 397
Wel's & Hall..... 397
Williams Patent Crusher and Pulverizer Co 391

Miscellaneous.

Baird & Co., Henry Carey 395
Burt Manufacturing Co..... 382
Chesapeake & Ohio R. R....390, 398
Clinton Paving and Building Brick Co., The..... 400
Coaldale Brick & Tile Co., The . 401
Dean Bros. Steam Pump Works 396
DeWit. H..... 395
Eastern Paving Brick Co..... 401
Engelhard, Charles 397
Evans & Co., Victor J..... 398
Evens & Howard 392
Gabriel & Schall..... 397
Green & Hunter Brick Co 401
Harper-Norton Shale Brick Co The..... 401
Indianapolis Engraving and Electro Co..... 396, 397
Indiana, Decatur & Western ... 399
Lake Erie & Western..... 399
McAvoy Vitrified Brick Co 400
Miller Oil and Supply Co 398
New York Brick and Paving Co 401
Osborne, W. R..... 396
Old Dominion Line..... 399
Preston Brick Co..... 400
Pennsylvania Line 398
Purington Paving Brick Co, The 400
Ripans Chemical Co..... 398
Sears, Roebuck & Co..... 396
Terre Haute Brick and Pipe Co. 400
Vandalia Line..... 398
Wabash Clay Co., The..... 400
Ads., Small Wanted, For Sale, etc.

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

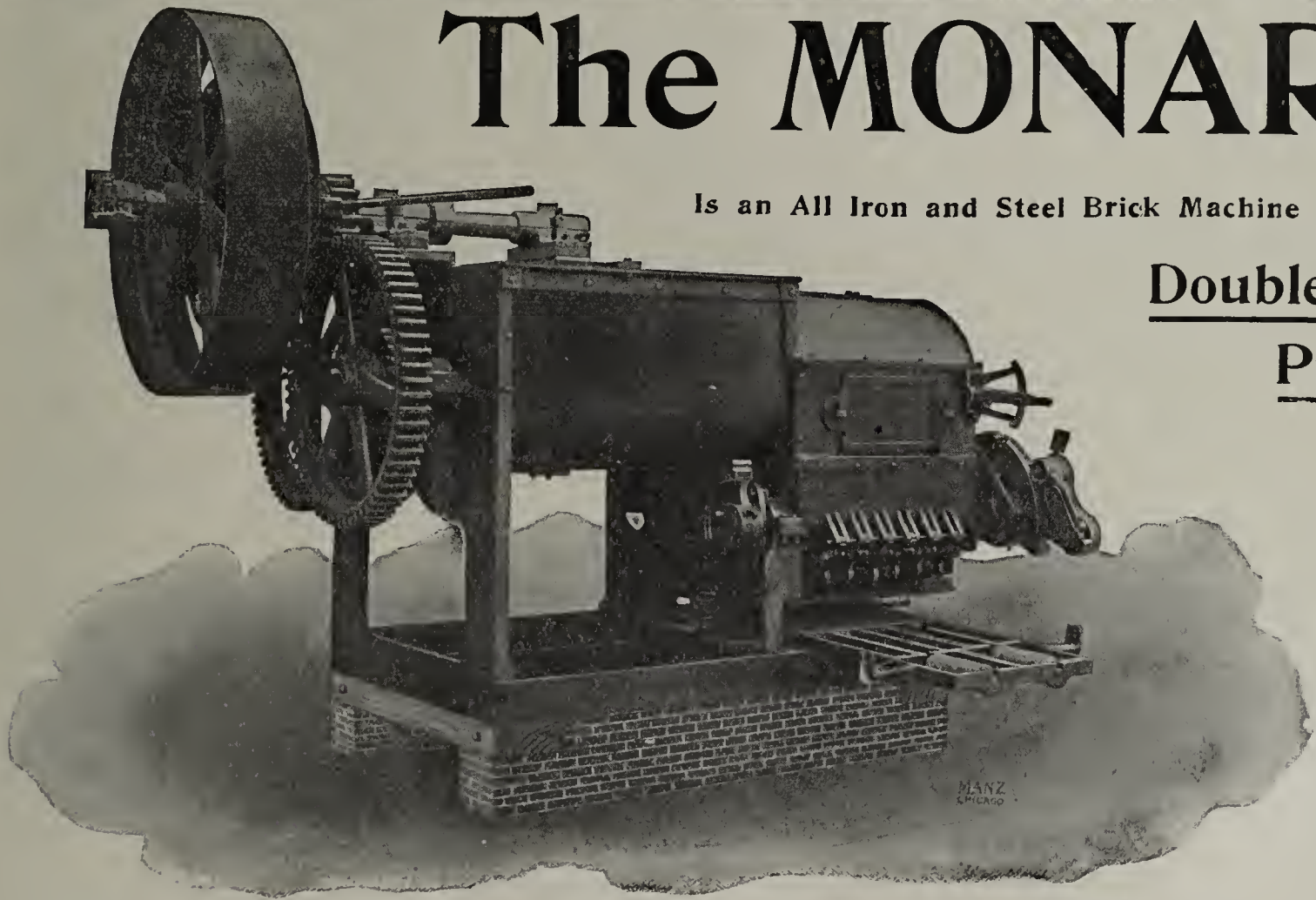
Samples or blue prints with prices furnished on request.

THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.



SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new IRON QUAKER. Engines and boilers. Send for new 1900 Catalogue.

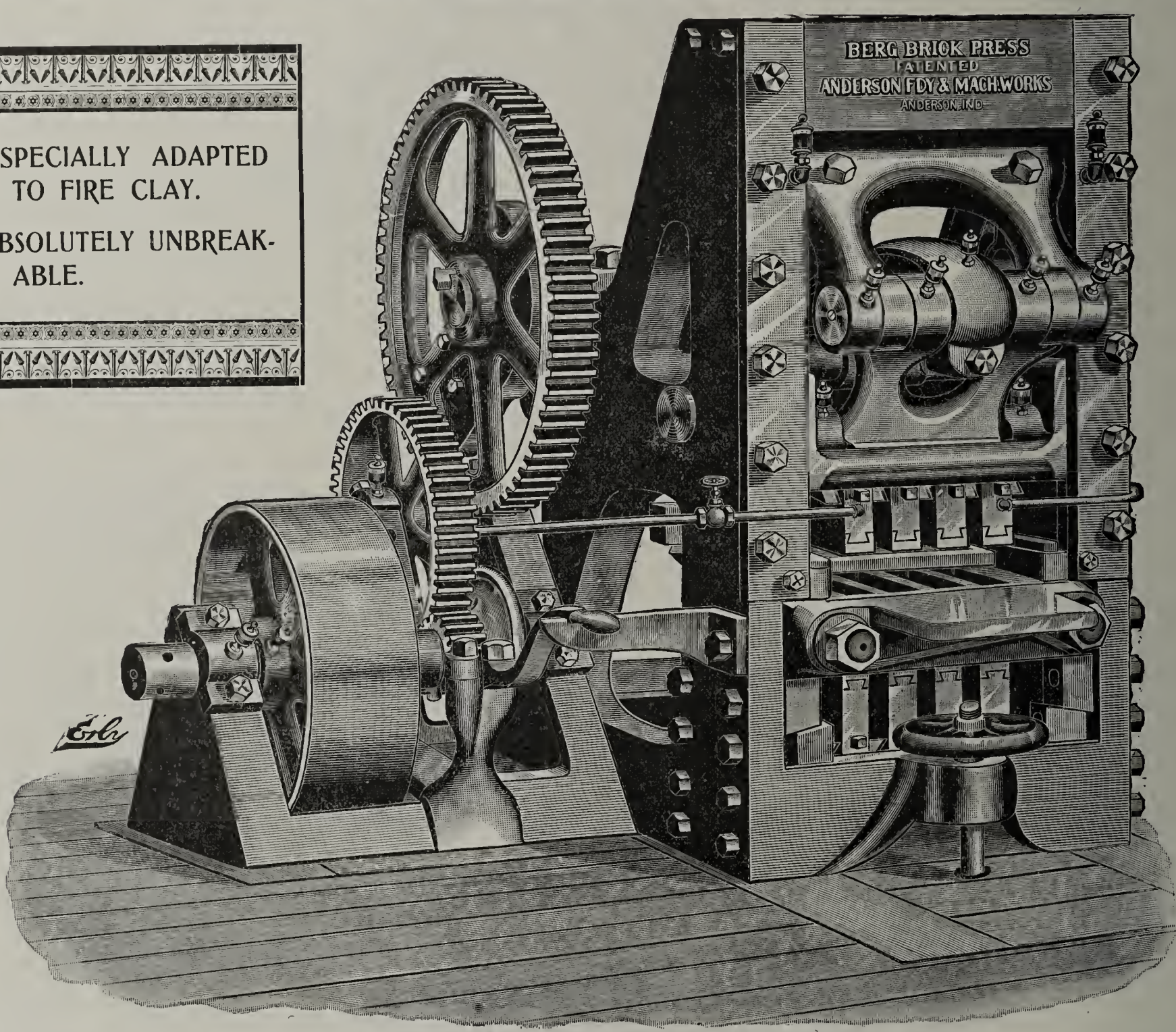
JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

MANUFACTURED BY

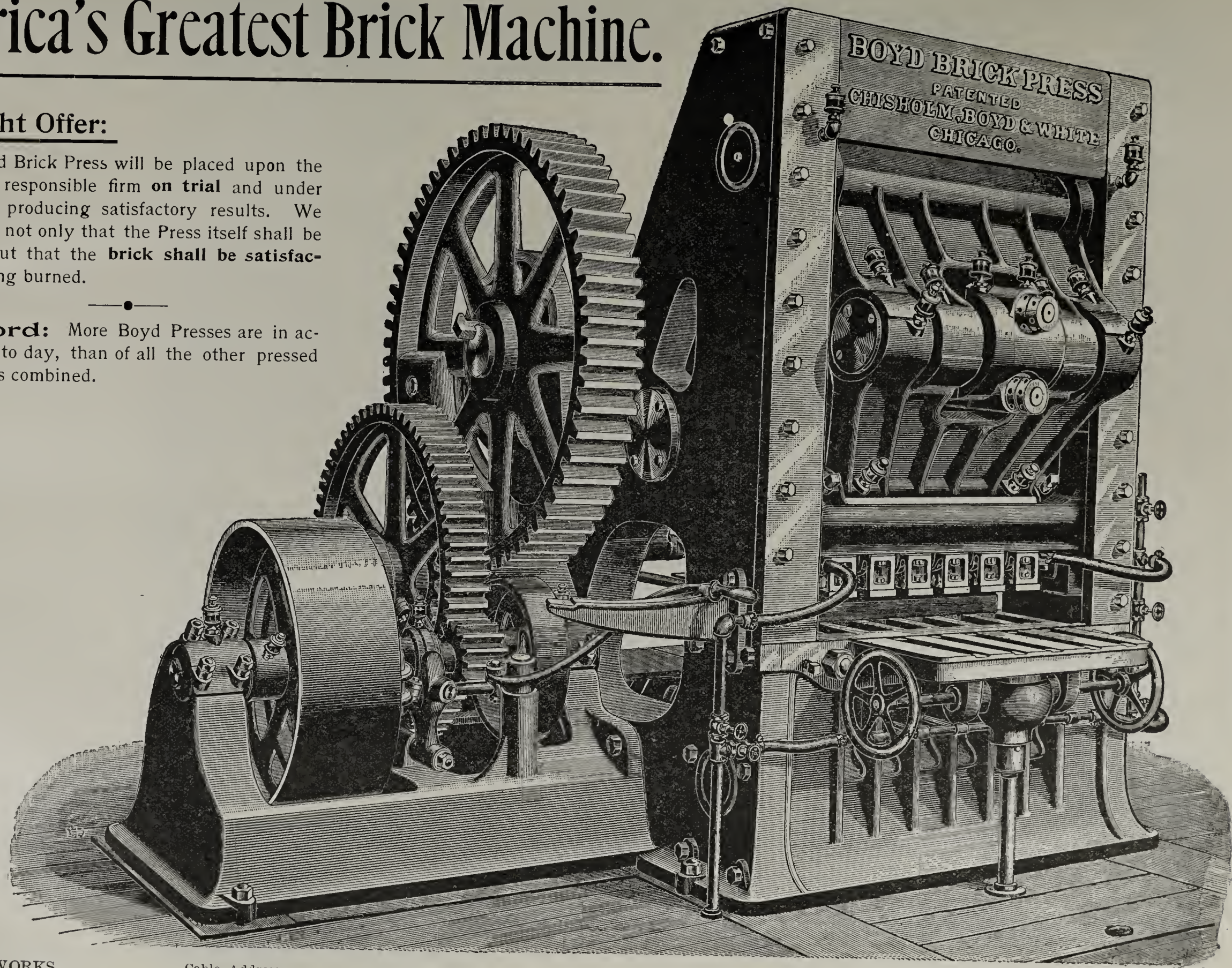
The Anderson Foundry & Machine Works,
Anderson, Indiana.

America's Greatest Brick Machine.

A Straight Offer:

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets.

Cable Address:
"CHISHOLM, CHICAGO"
A. B. C. Code Used.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The LATEST IMPROVED

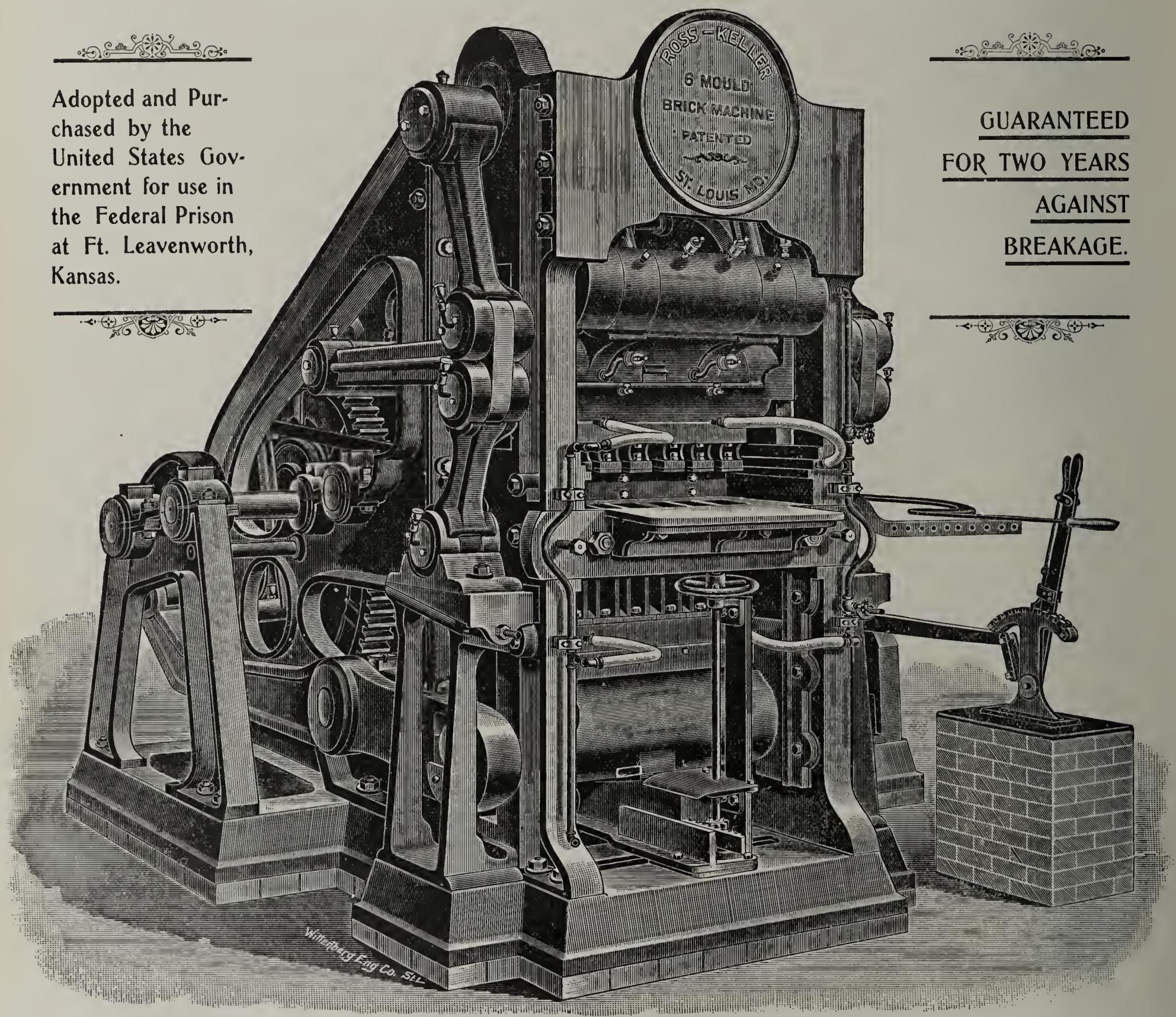
Ross-Keller TRIPLE PRESSURE Brick Machine

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 35,000 to 40,000 brick per day.

BRICK SET IN KILN DIRECT FROM MACHINE.

Adopted and Purchased by the United States Government for use in the Federal Prison at Ft. Leavenworth, Kansas.

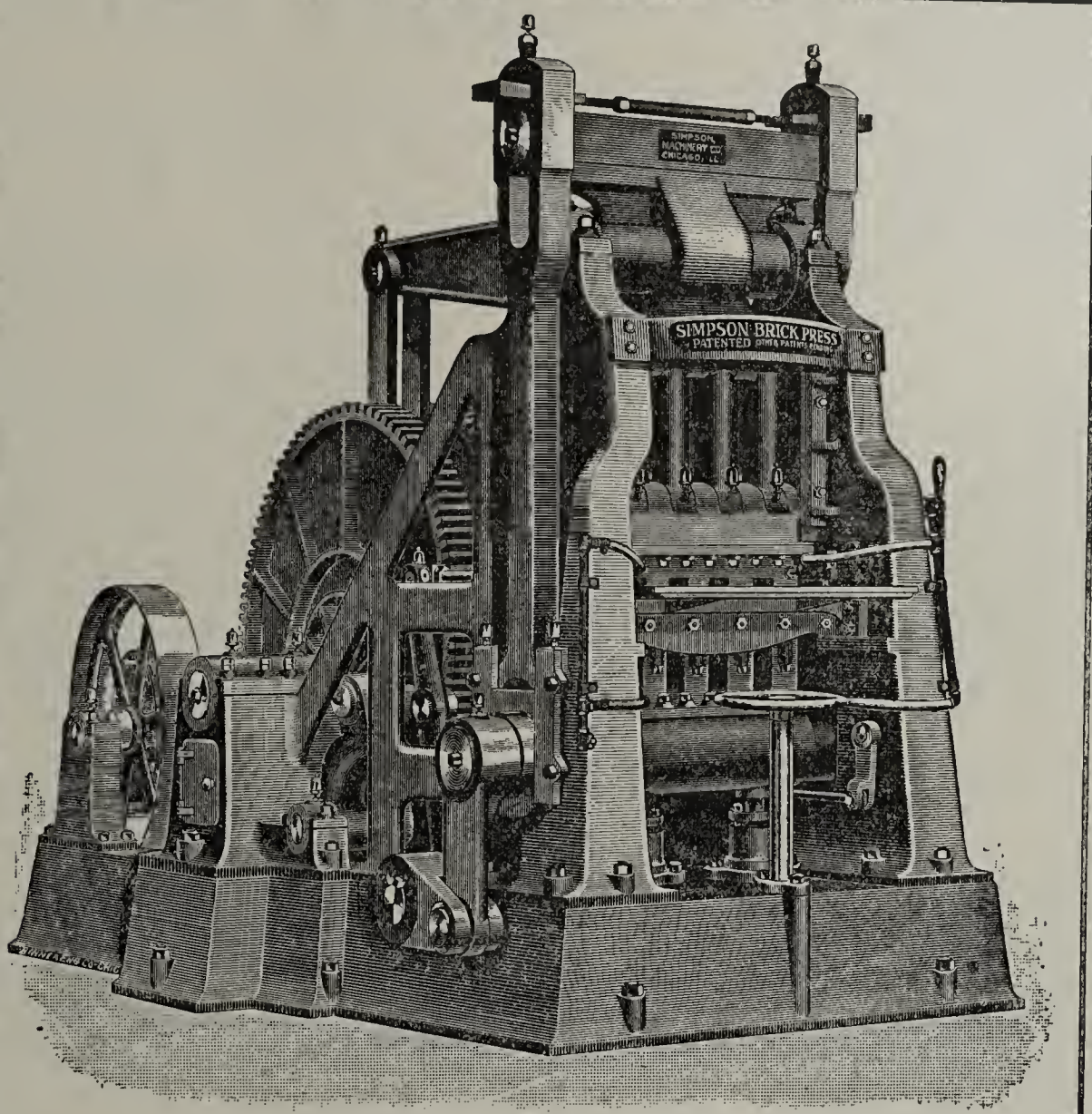
GUARANTEED FOR TWO YEARS AGAINST BREAKAGE.



THIS machine has an unbroken record of success. It is used on a number of the best equipped brick plants in the United States. It has never failed to give entire satisfaction and we are perfectly safe in guaranteeing that it will work any clay of which pressed brick can be made, and make them better and cheaper than any other press. It makes better brick because the pressure is greater and is applied in a way most effective. It makes brick cheaper because it is unbreakable and hence there are no repair bills or expensive delays and stopping of work which brickmakers know are more costly than the repair bills themselves. If you want to make the best brick at the least expense the season through don't fail to investigate this machine, with it you can "put money in your purse." Let us tell you more about it and give the address of those now using it. Remember "the proof of the pudding is in the eating of it."

For Prices and Full Particulars, address **ROSS-KELLER BRICK MACHINE CO.,** 915 and 916 Holland Bldg. ST. LOUIS, MO., U. S. A.

SIMPSON BRICK PRESS.



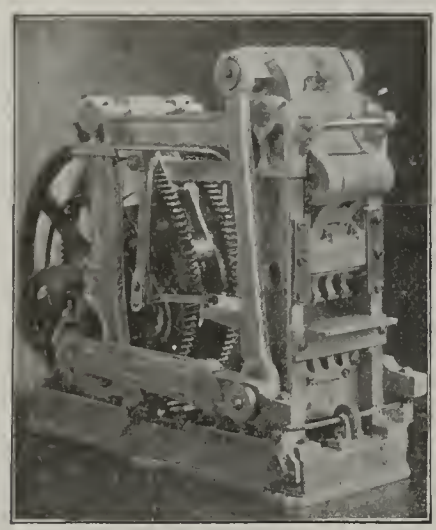
SIMPSON FIVE MOLD BRICK PRESS.

OLDEST ESTABLISHED--STRONGEST BUILT, GREATEST PRESSURE--MAKES FINEST PRODUCT ABSOLUTE GUARANTEE GIVEN

Largest and most successful brick yards in the United States and Canada use our machinery. Write for catalogue explaining our full line of brick yard specialties. **Screens, Conveyors, Elevators, Represses, Pulverizers, etc.**

THE SIMPSON MANUFACTURING CO.

Chicago Office 95 Dearborn Street. WINTHROP HARBOR, ILL.

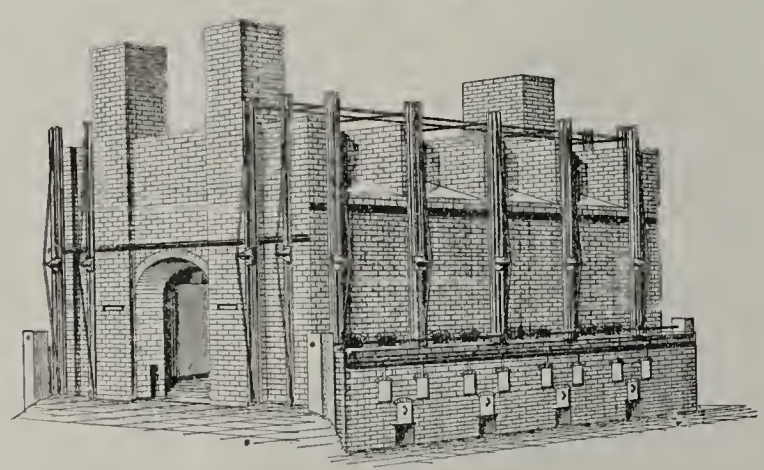


The GRATH DRY CLAY BRICK PRESS.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

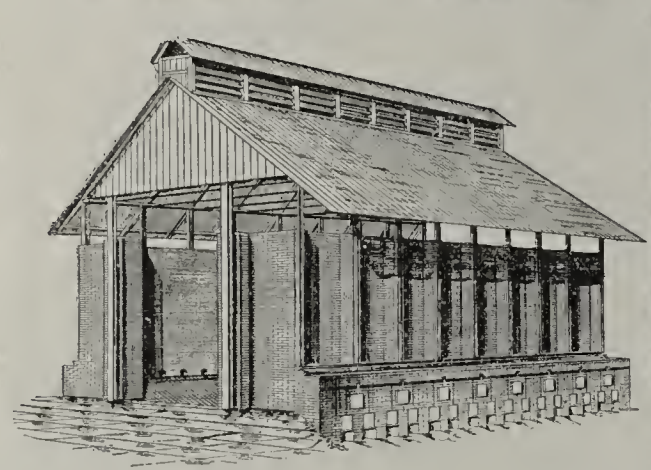
Features:

1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Requires less power to Operate.
5th. Brick free from Granulation.
6th. All Bearings Bushed.
7th. All parts Accessible.
8th. Thickness of Brick Changed without Stopping.
9th. Master Wheels Close to Bearings.
10th. No Working parts under Lower Cross Head.



The GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH GRATH GAS AND COKING FURNACES ATTACHED Built Round, Square and Continuous. Perfect results guaranteed. No soft, overburned or flashed brick, uniform throughout.

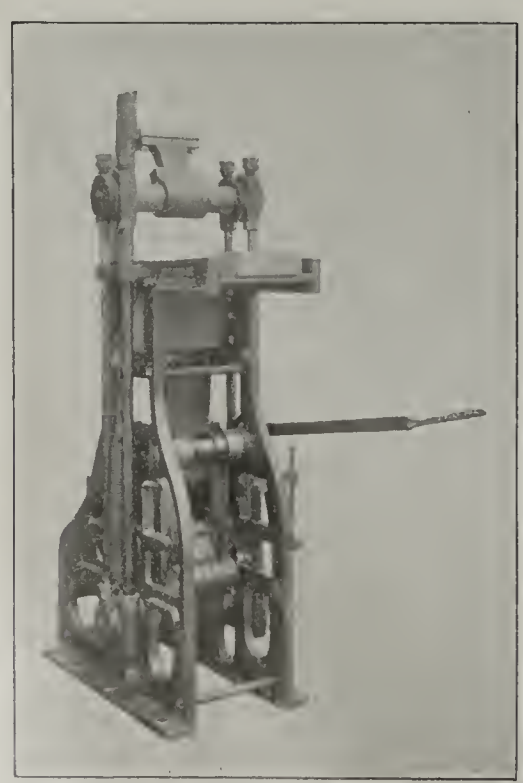


The Grath Up-Draft Kiln.

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with slack coal, with better results than lump coal in ordinary Furnaces and without any black Smoke.

The Grath Gas and Coking Furnaces

Can be attached to ALL kinds of Kilns, either old or new, and produce better results with SLACK than lump coal in ordinary furnaces. PROTECTION GUARANTEED TO ALL USERS. WILL PROSECUTE ALL INFRINGEMENTS.



The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK. The only successful Press of its kind in the market.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

Two men can make from 800 to 2,000 fine Press Brick per day, depending upon size and shape made.

REFERENCES. (For Hand Press.)

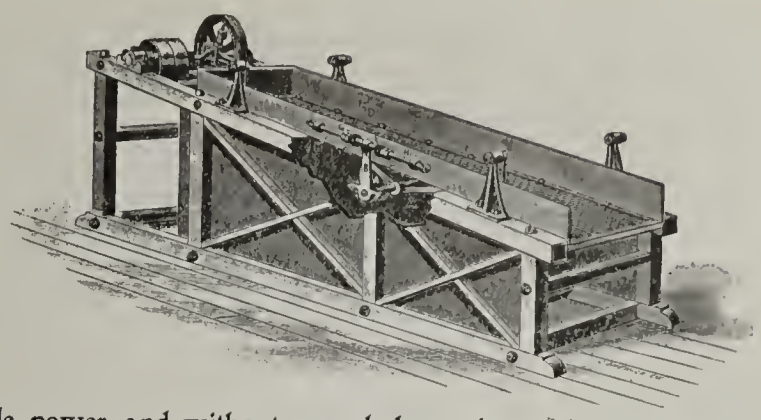
Coffeyville (Kansas) Vitrified Brick and Tile Co.
Columbus (Ohio) Face Brick Co.
Hanover Press Brick Co., Columbus, Ohio.
T. L. Myers, Los Angeles, Cal.
Otto Marstrandt, Vancouver, B. C.
The Arkansas Brick Co., Lester, Ark.
The Sunset Brick and Tile Co., Gonzales, Texas.
E. Danal, Shawnee, O. T.
Quincy Press Brick Co. Quincy, Ill.

For Further Information and Catalogue on Above, address

The Illinois Supply & Construction Co., ST. LOUIS, MO., U. S. A.

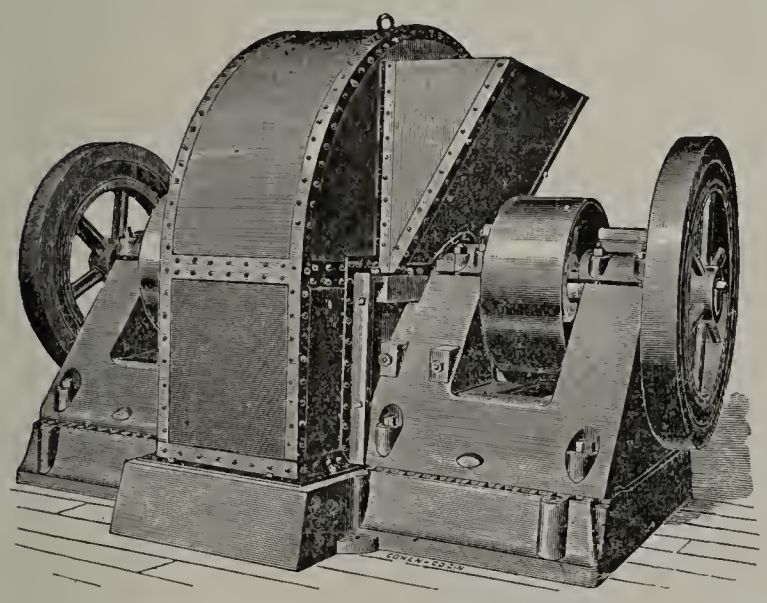
Mention The CLAY-WORKER.

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.



A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

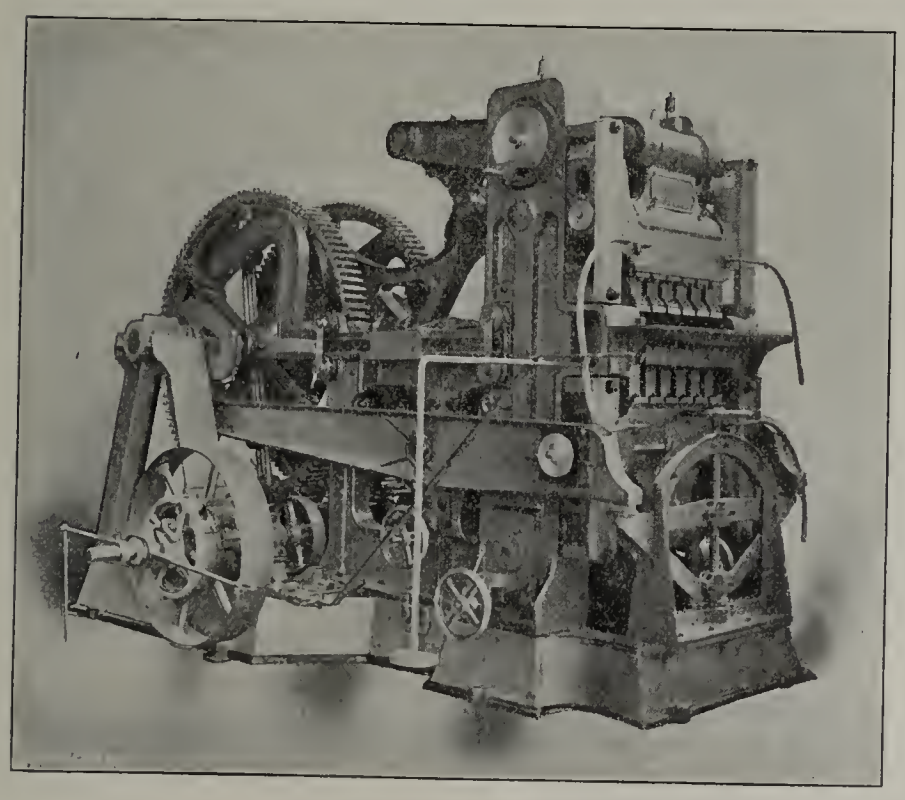
Write for catalogue, giving full description, references and testimonials.

Stedman Foundry & Machine Works,

AURORA, INDIANA.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, SIMPLICITY and SERVICE.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market.

All parts subject to strain are made of the best Bessemer steel.

Fitted with the Fernholtz Mold Box. Undoubtedly the leader.

We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer**, and the **Fernholtz Clay Mixer**, in our own factory.

Dealers in Brickyard Supplies.

THE FERNHOLTZ BRICK MACHINERY CO., St. Louis, Mo.

Gentlemen:—In reply to your letter, as regards your Dry Press Brick Machine, I have had one in use in Houston, a Four-Mold, for nearly three years. I am entirely satisfied with it. As to repairs, I have not had any, and now having decided to put in a Dry Press in my Austin Plant, as you are aware, I have bought of you, another four-mold Fernholtz Dry Press, Pulverizer and Mixer. I take pleasure in recommending your machine and Company. Respectfully yours, M. BUTLER.

Further Information on Application.

The Fernholtz Brick Machinery Co.,

CABLE ADDRESS "FERNBRICK." WESTERN UNION CODE.

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

THE STANDARD

IS RELIABLE.

The Standard Brick Drier,

Will dry perfectly, all kinds of clay products; will do its work quickly and economically, and give perfect satisfaction in every respect. This we **guarantee** it to do.

We Plan, Build and Equip Complete Drying Plants of any Capacity.

We shall be pleased to answer all inquiries, and explain any Drier points about which you are in doubt. Write for Catalog No. 50 and testimonials.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., NOVEMBER, 1900. No. 5.

WRITTEN FOR THE CLAY-WORKER.

BRICK CONSTRUCTION.

An Object Lesson For All Clayworkers.

IN YOUR OCTOBER number I notice the picture of the new office of the Purington Paving Brick Company, and I glory in this welcome addition to the ranks of men who are users of their own loved material in their own homes and offices. It certainly is a most creditable building, and I am very loath to criticise, still I do confess the stone trimmings jar me a bit. It had not occurred to me before that D. V. was not in possession of my postoffice address. I never could, or did, make much impression on him anyway, and it is possible I am to blame for not having advertised where it would catch his eye, and thus have attracted his attention. It is with great joy, however, that I notice the apology for this use of inferior material in the write up. D. V. is all right anyway. He is living on, he says, hoping to write my obituary, and afraid to go, I think, lest I write his.

Good, however, as is the picture of the office, my eye passes from it instantly and lingers on the pictured groups of occupants and the beautiful attitudes D. V. strikes. Just notice their number and grace. No duplicates, and every one a picture and a dream, and yet I feel sure that the supply was not exhausted, but that he has many more in reserve.

These pictures, though, are a revelation to me as to his own method of labor in Galesburg. I have often wondered why he went there so often, but these pictures show why, and that it is evidently to display or use his stock of poses and smoke Will's cigars. How I wish I had picked out a business that carried that style of trimmings!

Now as to buildings, there are others:

We have been occupying the office, of which I send you a photo, for more than a year, but did not dare brag about it or publish it, for fear of attracting the attention of the mortgagee and having him get excited and foreclose. The trim, you will notice, is of white terra cotta. The walls are of Purington brick. The use of which we now regret. We did not think of stone, some way, until later.

I cannot, however, send you any accompanying groups. I regret this as much as you, and know it will be very noticeable,

Factory Office of the American Terra Cotta and Ceramic Company, Terra Cotta, Ill.

following immediately, as it will, the other pictures, but we have none to send. We use no attitudes in our business. We are still hunters, and go out singly, spending our time mostly running, only sitting at rare intervals, and as for good cigars, why not even our stove smokes. When the picture was taken part of the force were away, hunting trouble, and those present at that time were afraid of the camera. It really is just a little hard for a nervous man to distinguish the difference between a camera and a gatling gun, particularly when he feels that the gun is due and the camera is not. GATES.

WRITTEN FOR THE CLAY-WORKER.

THE SPECTRE OF THE SAND BRICK.

THE TECHNICAL and daily press of both this country and Europe has devoted more or less attention to the subject of making brick from sand and lime, without burning, for the last year or two, and the practical results have reached dimensions which arouse the interest of every one connected with the brick business. Also, the sand brick question has so often appeared in connection with more or less mysterious processes offered to capitalists by which millions were sure to be made (and unmade) that it would seem but proper to have the whole subject brought to a discussion in the open light, so as to determine whether or not there is anything in it. Judging from the circulars of some sand brick promoters, the days of the clay brick are numbered, and it is high time for all clay men to become familiar with the new rival. In this brief discussion it is the writer's intention to treat only the most modern side of the sand brick processes and to neglect the old systems, manufacturing brick from sand with the help of soluble silicates, soluble glass, as being out of question, considered from the economic standpoint.

The modern sand brick is made from sand and slaked lime, the two materials being intimately mixed together, pressed into brick and then allowed to harden. The mass becomes hard, and after several days the brick are ready for use. The processes proposed differ in their details quite considerably, so that we may distinguish two methods in regard to mixing the lime with the sand, and three in regard to the hardening process. One inventor converts the lime into a slush of lime hydrate and mixes it with the sand in this condition; another uses the dry quick lime and mingles it with the wet sand. In the first case the mixture must be dried before it can be pressed properly by the machine, and again after the brick leave the machine, so as to remove still more of the moisture, which would cause too much steam to condense on the brick and thus "squash" them. In the second the heat produced by the slaking lime is sufficient to dry the mixture for pressing, or completely, in which case more moisture must be added for satisfactory pressing. The hardening is accomplished by allowing steam to act upon the brick made from the sand and lime mixture, or by bringing them in contact with pure carbonic acid gas. In the steam hardening either low or high pressure may be used; with the former the hardening requires about three days, with the latter eight to twelve hours. Thus we have the three methods of hardening, viz., high steam pressure, low pressure and the carbonic acid process.

The chemical reasons for these processes are quite simple and tell us that the manufacture of lime-sand brick is based upon a rational basis. Steam, especially at high pressure, that is, high temperatures, causes the lime to attack the quartz grains of the sand. representing silica, to form hydrous silicate of lime, which is a process analogous to the one that produced many of our natural stones and rocks. When carbonic acid gas acts upon the mixture of lime and sand it only reacts with the first, forming carbonate of lime, which cements the particles of sand together. The carbonic acid method, however, is not as promising as the first, and has, so far, no practical results to show.

From this brief sketch we might well ask questions like the following: Have sand-lime brick been made on a large scale, successfully? If so, is the manufacture profitable, and what is the actual cost of making these brick? How do sand brick compare with clay brick in regard to quality? Will the manufacture of sand brick ever become a dangerous competitor to clay brick?

Sand brick are now manufactured on a large scale in Europe, the output being many millions per year. Accurate figures could not be obtained, but the writer has direct and indirect knowledge of some twenty continental factories. A number of factories failed to produce satisfactory brick at the beginning, but now, as far as can be learned, most of them make salable products. The plants are, of course, located near beds of sand, the ideal locations being where sand, lime and coal can be had close together. Along the coast sea sand has proved an enormous source of satisfactory material. The finer the sand the harder will be the resulting brick. By means of machines similar to pug mills and granulators the sand and 7 to 10 per cent. of lime are intimately mixed, the sand being usually wet and the lime in the shape of quick lime. The warm mass is moistened to the sufficient degree for pressing and charged into a press something like a dry press. The brick taken from the machine are placed on iron cars, which either run on tracks into large steel cylinders, resembling boilers, in the case of high pressure, or into tunnels, if low pressure is used. The general tendency seems to be towards the age of high pressure on account of the better quality of ware produced and the diminished loss by "squashed" brick. A pressure of about 100 pounds per square inch is maintained, so that the cylinders must be well constructed in order to be safe. By means of cranes the heads of the cylinders may be lifted when the steamer is full, with but little trouble. It is easy to see that quite a capital is represented by a plant of such boilers producing say, 40,000 brick per day. As has been mentioned before, the steaming is continued for about eight hours. The coal required to furnish steam for making 1,000 brick is about 200 pounds, the cost of labor is said to be from $1 to $1.50 per thousand. A plant for making 40,000 brick per day of twenty-four hours requires a capital of something like $40,000, or about a capital of $1,000 for every thousand of brick. The cost of getting the sand and lime differs, of course, with local conditions. Since these figures are obtained from interested parties, they should be taken with some caution. One expert reports the cost of manufacturing as being $2.50 per thousand.

In regard to the quality of brick thus made, it can be said, without fear of contradiction, that in regard to crushing strength they are equal to the average clay brick. Their porosity is the same. For wear like paving brick are required to stand the sand brick are entirely unsuited, and will never in the least be able to compete with clay brick in this respect. As to resistance to heat, they are about on a level with cement, and they are hence greatly inferior to clay for fireproofing purposes. At a bright red heat the surface of the sand brick crumbles and the entire brick is very apt to go to pieces.

From what has been said, it appears that sand brick will never compete seriously with clay brick wherever there is a fair clay to be found. But in districts where sand is plentiful and good clay not to be had the sand brick has a good chance. Since it has an appearance closely resembling that of sandstone, it may make a place for itself due to this fact, in imitating, or, rather, replacing natural stone. For decorative work in construction the field of artificial sandstone is certainly very promising. Owing to its cheapness and facility of molding it is quite likely that a new branch of industry will arise in the manufacture of architectural ware, but the danger of competition with brick is certainly a very remote one, indeed. AMERICUS.

SOME LITTLE TIME ago, during a visit of one of the best known and highly respected members of the N. B. M. A., he casually observed, as we strode up Chestnut street, "Philadelphia has mightily improved during the past ten years; do you know it?"

On behalf of the citizens generally, and clay-workers specifically, I acquiesced, in a tentative way, striving meanwhile under cover of my mustache (he didn't wear one), to smother down the objections I was about to give vent to, in reference to the straggling hotchpotch, heterogeneous samples of store buildings, that every now and then rises up in a day and night, and thrust their hideous faces before your notice, as if striving to exact from you a specie of sympathy of which your nature does not possess the faintest iota.

We are acquiring a few trenchant examples of the mammoth office buildings, but only in one or two instances are the lines dictated, such as may be accepted from an artistic and purely architectural standpoint.

Choice of material must first be the critical lines, on which you must stand, to adopt such as will stand the hard test of our weather. Harmonizing lines come next. And this should be within the province of the architect to set down, to prove both to his clients and the world at large his ability as a public tutor, to create so that at all times, he, you and I, may look upon it and refer to it with pardonable pride and respect. Some two years ago, in these same columns, I referred to the possibility in the near future of the color scheme being adopted. By this I mean the adoption of certain materials that harmonize in color and are absolutely adaptable for a certain side of the street—the north, east, south or west having a tone or color that would seem artistically commensurate with the peculiar medium of light.

This is now the problem with which the color schemers are wrestling up in Buffalo, so that the exposition may give to the world the artistic value of what every American city now stands in need.

The World's Fair, the Paris Exposition, gave little time and thought to this wonderful factor, yet in reflection think of what it would do for the exterior arrangements of our cities. Education cultivates and creates refinement, if not money, and you will all agree with me that the very first thing we do on furnishing the interior of the house is to see that the things generally are placed in some form and order, and that they harmonize. Truly, it's very much like feeding the stomach and neglecting to clothe the outer man.

One of the best expressed color values as applied to the house exterior is to be seen at Ogonty, some nine or ten miles from the city, the residence of William T. Roberts.

The house, standing upon a rising prominence, is of the Spanish renaissance (some say Italian), broad rather than lofty in its lines, with a dignified porte cochere, half-open porch, and a balcony that has been built for comfort and elegance. It is 133 feet long and 44 feet wide. Now comes the material. Philadelphia common hard brick has been used for the non-exposed parts, but for the base, rising up to the sills of the first floor, the Jordan Brick Co. have contributed some of their best buff, with no other line of relief than a large diamond running in a continuous line, formed of a cream-white brick. The sills and quoins are also of buff brick, and the terra cotta keystone forms a simple relief to the exquisitely toned stucco of the upper walls, shaded to a depth of 18 or 20 inches by the projection of the broad Spanish eaves, covered with red Spanish tile.

It stands as an excellent illustration of what may be done with color to make the exterior as charming as the interior.

—Terra Cotta Reliefs.—

Answering to the popular demand for ornamentation, our apartment houses and office buildings are framed in a relief of terra cotta. The sharp click-click of the stone mason's chisel is now becoming a rarity. Instead you may see the bricklayer absorbing his 40,000 Roman or Pompeiian brick in company with the terra cotta man, who patiently scrapes and sets into place his twenty or thirty thousand feet of terra cotta detail.

The latest to arrive at a stage of completion is the eight-story office and store building, designed by Willis J. Hale, architect, located at 931, 933 and 935 Market street, having a frontage of 69 feet and a depth of 192 feet. The main entrance centered is supported by two Corinthian columns, from which springing in bold relief are two well-proportioned and graceful female figures. The six architraves forming the sections of the facade and the frieze and cornice are all in terra cotta, the work of the Conkling-Armstrong Terra Cotta Co., of Tioga, and the Master Builders' Exchange. In the spandrel heading this article the eye notes the excellent proportions of the human figures, "Learning" and "Science." They are so aptly expressed and so well modeled in execution that they serve as instruments of art, signal evidences of local and national re-

finement blending well with the monotone of the brick front, which will become better modulated with the imprint of Time's hard footsteps.

Thus, as time progresses, the clayworkers of this century must merge their causes and their ambitions, striving each to annihilate the intrusion of stone, with all its variegated elegance, and accepting its company on one condition; that is, for stone to stand alone, to be a neighbor, if you choose, but for terra cotta and brick to be companions now and forever.

Look again at the group on the following page. Here we have

Terra Cotta Cherub, Modelled by Conkling & Armstrong.

a modeled sketch designed by the same well-known hands—even the most blatant skeptic must quit his caviling and make the ready admission that figures such as they are will make a better impression on the juvenile mind than will many of the hideous creations in bronze, which are supposed to adorn—but do not—our public squares and parks. Threading my way through the many thousands of feet of cornices, string courses, friezes, capitals, entablatures, architraves and pilasters, in company with Mr. Conkling, I could but feel that the clayworker's lot is not an unhappy one.

Modelers and casters, off-bearers and laborers all seemed in their respective vocations sincerely happy. Sometimes the human voice broke out in a few well rounded, musical notes. Why was it? It was the pean of victory, a spontaneous outburst, caused by the law governing creation.

"A something attempted, something done,
To earn a night's repose."

In addition to the above work, Conkling & Armstrong are getting out the terra cotta for a large residence to be erected at Pittsburg, Pa., designed by Architect George Orth. Also for the American Bank Note Company's building, to be erected on Library street, in this city; a twelve-story building of brick and terra cotta, designed by Architect E. V. Seeler; and an office building, to be erected on South Penn square, by Architect Max Berger.

To complete this work according to the specifications, a staff of from 100 to 150 men must be kept going through the winter months.

The past two months has been slow for our brick men, but with the advent of this new work good reports will be forthcoming for the next issue. W. P. LOCKINGTON.

The world's experience is largely garnered in proverbs, mottoes, etc. Thus a few words will often embody the profoundest philosophy—the deepest wisdom. The best collection of these wise sayings contains this one:

"There is that scattereth and yet increaseth; there is that withholdeth more than is meet, and it tendeth to poverty."

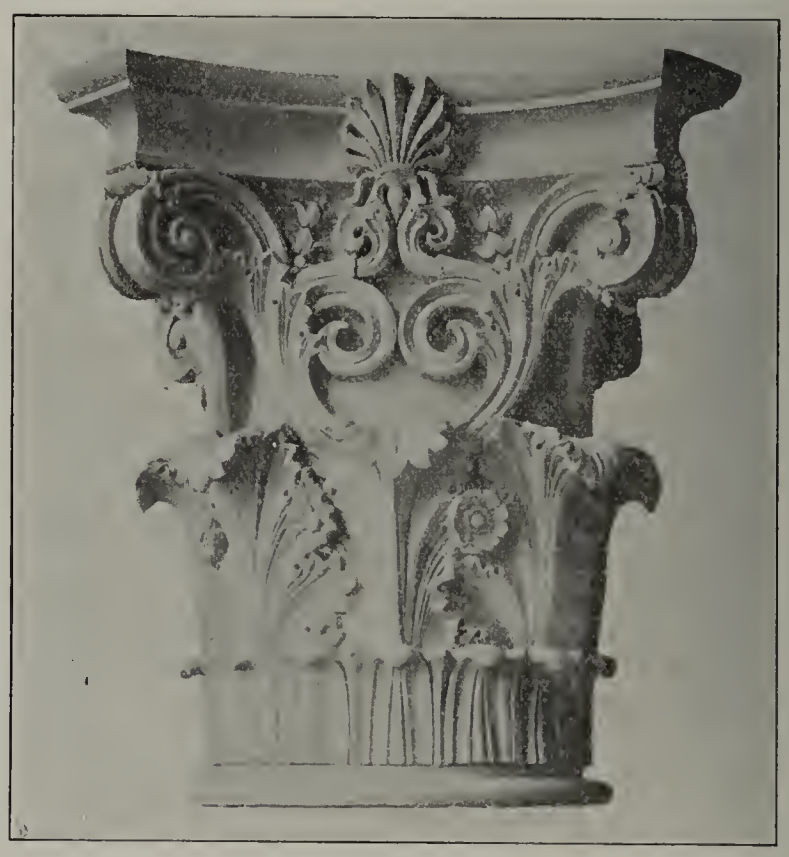
Human experience for three thousand years crystallized in these words; human experience for three thousand years since they were written has proved their deep, eternal truth. Their application is as wide and varied as the needs of humanity. One application is pertinent to those for whom The Helper is published. Bakers do not suffer by contributing to the general stock of trade information.—Helper.

Written for The Clay-Worker:

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 13.

BY ALFRED CROSSLEY.

I NOW call attention to a variety of fire brick of most remarkable character. I refer to bauxite brick. The material from which they are made, called bauxite, is described by the chemists as a hydrated aluminous ferric oxide, of variable composition, containing usually about 60 per cent. of alumina and only from 1 to 3 per cent. of silica, with 20 per cent. of ferric ovide and from 15 to 20 per cent. of water, but other specimens contain a much larger proportion of silica and less ferric oxide. It is a very refractory body, and affords an example of a substance containing some 20 per cent. of oxide of iron, but being yet practically infusible, whilst 4 or 5 per cent. of ferrous oxide in most fire clays render them as fusible as ordinary brick, and 2 per cent. of ferrous oxide in a Dinas brick renders it quite useless in the steel melting furnace. Bauxite, or "Beauxite," was so named from a hill in the south of France, called "Colline des Beaux," where it was first observed in a superficial deposit. The first specimen of it was taken and an analysis made of it by the celebrated French chemist, Berthier, in 1822. Large deposits have since been discovered in the south of France, in Calabria, in the Grecian Archipelago and in Senegal, in Africa. Another deposit, called Wocheinite, found near Lake Wochein, in Styria, is regarded as identical with bauxite, and so also is a deposit of so-called aluminous ore from Ireland, near Belfast. In the United States the only deposits known of with certainty, except any that may have been recently discovered, are in Georgia and Arkansas. The Georgia deposit is said to be only of small extent, but in Arkansas the deposits are very extensive, if the reports are reliable. The beds there, it was said, were known to cover an area of 640,000 acres, in Salvine and Pulaski coun-



A Modern Capital.

ties, and the average thickness has been placed at fifteen feet. I should think that by this time the development of these extensive deposits will have commenced, and the manufacture of these brick established, though I do not remember to have seen any definite account of this. Bauxite varies much in color, being whitish, grayish, ochre-yellow, brown or red. It is transformed at a very high temperature into crystalline corumdum (crystallized alumina), comparable to emery in appearance, as well as in physical and chemical properties. The

varieties of it richest in alumina are, or have been, used as the source of aluminum by the producers of that metal, and are accordingly designated aluminum ore. The following are a few analyses of it from different localities:

	1.	2.	3.	4.	5.	6.
Alumina	58.1	57.6	30.3	64.24	40.0	34.57
Peroxide of iron	3.0	25.3	34.9	2.40	33.6	27.93
Protoxide of iron	....	....	....	....	....	5.08
Silica	21.7	2.8	....	6.29	2.0	9.87
Titanic acid	3.2	3.1	....	....	....	3.51
Lime and magnesia	....	....	....	1.23	....	1.53
Carbonate of lime	Tr.	0.4	12.7	....	....	....
Sulp. and phos. acids	....	....	....	.66	....	....
Water	100.0	100.0	100.0	100.56	100.3	101.85
Water	100.0	100.0	100.0	100.56	100.3	100.85

No. 1 is from Arles, France; No. 2 from near Toulon, France; No. 3 from "Communal des Baux," France; No. 4 from near Lake Wochein, Styria; No. 5 from Upper Senegal, Africa, and No. 6 from Belfast. Ireland.

From these analyses, and others that could be given, it is evidently of variable composition, and hence it is probable that not every variety would be suitable for making into refractory brick, but from some of the deposits such brick have been made, and used with the best results. They are thus described by Greenwood:

"Bauxite brick are formed by mixing the calcined bauxite with from 6 to 8 per cent. of some binding material, such as clay or plumbago, whereby, upon the application of an intense heat, the plumbago partially reduces the iron of the bauxite and the brick so produced become practically infusible. Where such brick can be applied they are much more durable than the best fire brick. They resist the most intense heat, as also the action of basic slags. After heating for some time they become intensely hard and then also resist strongly the mechanical action of wear and abrasion."

I have not seen any stated explanation of the remarkably refractory character of bauxite brick, but it is no doubt owing to the high percentage of alumina contained, and this not being sensitive to any fluxing influence by the oxide of iron, and at the same time the silica being in too small a proportion to effect the dangerous combination which it would otherwise be likely to do.

The last refractory materials I will refer to are lime and magnesia. These substances we have come to look upon as natural enemies in a fire brick, for, as has been shown, both have a strongly prejudicial effect on fire clays, especially when occurring together. And yet, either of these, per se, is one of the most refractory substances known, and no temperature has been as yet attained which has caused either of them to exhibit the slightest indication of fusion. (Percy.) Lime, however, cannot be made of any service in the production of fire brick. After being heated or calcined, and then exposed to the atmosphere, it slacks and falls to powder, a phenomenon with which all are familiar. Hence as a refractory material it can only be used in such furnaces as allow of a continuous, non-intermittent heat, as in certain Styrian furnaces, where it has been sometimes employed. It has also been sometimes used in making very small crucibles for melting platinum, and other uses.

Magnesia, however, has not only been used for crucibles, but also, to a limited extent, been made into fire brick. Caron, a

Group Designed by Conkling Armstrong, Terra Cotta Company.

French chemist, I believe, experimented with magnesia as a material for crucibles, fire brick and the lining of reverberatory furnaces for melting steel, and made a communication on the subject to the French Academy, in 1868, from which the following information in regard to magnesia fire brick is abstracted. He used in his experiments native carbonate of magnesia, from the Island of Euboea, in the Aegean Sea, where it occurs in large quantity. The material from that locality is very compact and tolerably hard; it contains traces of lime, silica and iron, and occasionally "serpentinous" matters and large plates (plaques) are disseminated through it, which would greatly lessen its infusibility. The flakes may be easily seen and separated, even on a manufacturing scale. The presence of these matters in fire brick might cause slight vitrification at the highest temperatures, but not any serious inconvenience. Before trituration the mineral should be calcined in order to drive off its carbonic acid, as it is thereby rendered more friable and more easily pulverized, and it then becomes possible to separate the intermixed serpentine and silica which is not disintegrated by heat. After this treatment, the magnesia is incapable of being agglomerated, but even if it were otherwise, subsequent exposure to a temperature exceeding that of the calcination, would produce enormous contraction, attended with cracks and distortion, which would forbid its use. Hence it is indispensable to expose the magnesia before it is molded to a very high temperature, equal, at least, to what it is intended afterwards to support. After being strongly heated, it is non-plastic, has a sand-like appearance and does not cohere by compression. It acquires the last-named property by intermixture with magnesia calcined at a lower temperature, and accordingly such a mixture was employed by Caron in his experiments. The proportion between these two varieties of magnesia must necessarily vary with the temperatures to which they have been respectively exposed. Magnesia which has been heated to the melting point of steel requires the addition of about one-sixth of that which has been heated to the lower degree. The mixture so prepared is to be moistened with from 10 to 15 per cent. of its weight of water, and when intended for brick is to be strongly compressed in iron molds. A magnesia brick, produced as above described, hardens by drying in the air and becomes more resisting by subsequent heating to redness. Magnesia linings have been used for the Bessemer converters at the great Creusot Works, in France.

The above descriptions of magnesia and other brick are given, not from any especially practical value which they may have, but from the undoubted interest which they possess and also to show that highly refractory brick can be and are made from other materials than fire clay.

(To be continued.)

KEEPING IT ALIVE.

Intelligent stock raisers know that a certain amount of feed is necessary to keep an animal alive. They might feed that amount as long as it lives and it would never gain a pound. There is no profit in that kind of feeding. The kind that pays is the kind that builds flesh rapidly. If it takes twenty pounds of food each day to keep a sheep alive, twenty-five pounds a day will make it gain flesh. It's the extra five that brings the profit. The first five pounds amounts to nothing, nor does the second, or third or fourth five pounds. It's the same way with advertising. You have to do a certain amount to overcome the resistance of the public. You have to do a certain amount of advertising to make them wake up to the fact that you are in business at all. You have to pay a certain amount to keep your advertising alive. What you pay above that amount brings profit. Some advertisers fail because they do not use enough space. They use barely enough, or sometimes not quite enough to make the advertising self-sustaining. A little bit more would make it profitable. It is better to advertise a little too much than not quite enough. —Bates.

Written for The Clay-Worker.

SOME CURIOUS OLD WATER COOLERS MADE IN AMERICA.

By Edwin A. Barber.

CURIOUS OLD pieces of American pottery are constantly being brought to light. A crockery dealer recently came into possession of a black ring-shaped bottle or canteen, nine inches in diameter, which he claimed to be a relic of the Revolutionary war. It turns out to be one of the black glazed, red earthenware pieces made at "Bean Hill," near Norwich, Conn., early in the present century. These vessels, designed to hold cider or water, were made to carry in the harvest field, on the arm of the reaper. It bears evidence of having seen considerable service. The sides or faces are worn and rough, as the result of being frequently laid upon the ground, and several smooth surface cuts show where the sharp edge of the scythe has shaved off the glaze while being carried on the worker's arm, or lying hidden from view in the grain or grass. At "Bean Hill" pottery bean pots and other vessels, and children's money safes bearing the dates 1794 and 1812, are known to collectors.

One of the most outlandish designs known to collectors of pottery is a stoneware or coarse terra cotta vessel of the general form of the ordinary vinegar or molasses jug, but modeled on one side in the semblance of a grotesque human face. The color of the clay is yellowish, and the glaze is of a purplish

1. Harvest Canteen, Norwich, Conn.

brown, almost approaching black. A different sort of clay was inserted for the eyes and teeth—almost white in color—light and porous in nature, and entirely unglazed. The white clay forms a strong and startling contrast to the dark color of the glaze which covers the remainder of the face and head. These objects are occasionally found in collections, and are popularly supposed to be the work of a native tribe in Africa. I have seen no less than five of them, all of the same type and appearance, varying only in size.

The belief that they are of African origin is erroneous. They were, in reality, made in the United States. They were produced at a little pottery in the woods of Aiken county, South Carolina, by negro slaves, about 1862, soon after the

breaking out of the civil war. They are exceedingly hideous in appearance and crude in workmanship, the clay being very sandy and coarse grained, while the glaze is composed of wood ashes mixed with sand. These vessels were called "monkey jugs," not on account of any supposed resemblance to the head

2. "Monkey Jug" of the Southern Negro.

of an ape, but because the porous vessels used for cooling water by evaporation through the clay, were so termed. They are of peculiar interest in showing the outcropping of the African art instinct in the American negro after many generations. The evaporation can take place only through the eyes and mouth, which are not covered by the glaze, but it is said by those who claim to know that sufficient moisture escapes through these orifices to perceptibly lower the temperature of the water inside.

The typical form of the common water monkey is the globular body furnished with a straight spout, a neck for receiving the water, and a handle for carrying. This form is common in certain parts of Central and South America, and is also known in Arizona and other parts of the West. It is of Spanish origin, and is often found in sections that were peopled or visited by the early Spanish explorers.

It is interesting to learn that the same type of vessel was produced at a small pottery in Westchester, Pa., upwards of half a century ago. Many men now living can remember when this form of cooling and drinking vessel was commonly in use on the farms through Chester county, Pennsylvania, during harvesting time. It was a familiar object in the field, accessible to the thirsty laborers, who could always depend upon obtaining a cooling drink from its capacious body. An example which has recently turned up near the source of its origin in Pennsylvania is of yellow, unglazed clay, and has a capacity of about six quarts. The oldest inhabitants believe that its manufacture in this section may be explained on the supposition that more than fifty years ago a jug of this form was brought East by an army officer who resided in Pennsylvania. The local potter saw it, and at once set to work to reproduce the shape. The jugs became popular with the farmers, and were manufactured in considerable numbers for a while. They are now only a memory, however, as the pottery itself has long since passed out of existence, and the "water monkeys" that have survived it are "few and far between."

WHAT'S THE MATTER WITH KANSAS.

And now the world is asked to concern itself more or less over a "famine" in Kansas—a "car famine." This condition has come about because of an unusually large grain crop, an output of the cereal so great that the farmers and the railroads are said to be "seriously perplexed" to know how they shall find cars enough to get it all to market. The railroads are borrowing all the cars they can to meet the awful emergency, and one line has just added 3,000 new cars to its equipment. The Kansas farmers have also undergone fearful sufferings in their efforts to get help enough to harvest their crops, although they offered as high as three dollars per day for such service. A still deeper touch of agony is given to the situation by the statement that the farmers are "getting out of debt, have money in the bank, and are not compelled to sell their wheat at once, as in former years." Rubber-tired wagons, pianos, automobiles and other afflictions of the kind are said to have an extensive sale in the Sunflower State just now as one result of all this miserable prosperity. We have as yet received no photographs illustrative of the horrors of this "famine" in Kansas, but they will doubtless be forthcoming before the distress is over. What could be more harrowing, for example, than the picture of an aged agriculturist lifting an old mortgage off his farm? It makes one weep even to think of it.—Leslie's Weekly.

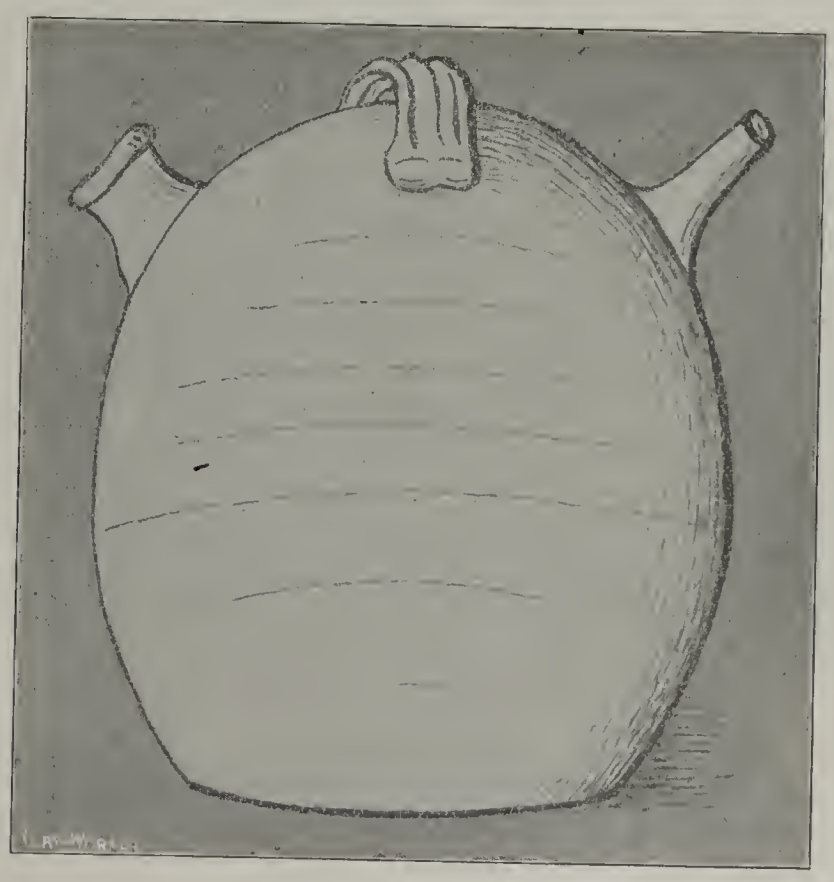
Written for The Clay-Worker.

WATCH THAT BURNER!

D. W. Stookey.

—How to Fire.—

IN firing with grates and doors either have a coal pile at each door or carry coal along in a wheelbarrow. Three tools are needed. The clinker bar need not be carried along, but should be left in front of the next furnace to be clinkered. The shovel and a light iron hoe with a long handle should be carried on the wheelbarrow. With the hoe open the furnace door. Stoop down and look the fire all over quickly and carefully. Notice where the low and high places are in the coals. See if there be any dark spots or bare places on the grates. Decide whether the furnace needs clinkering, one or two



3. Earthen "Water Monkey."

shovels of coal, or what it wants. Push the hot coals from the front towards the back of the grates, leaving enough in front to kindle the fresh coal, which should be thrown on the front third of the grates, and the door closed. All this must be done as quickly as possible, to prevent cold air from rushing into the furnace. Never stop to talk, light a pipe, take a chew of tobacco or drink of whisky, while the furnace door is

open or allow a man to do it. If he takes the whisky at any time you cannot trust him.

Railroad corporations that are said to "have no souls" have barred the drinking man out of their places of responsibility, and justly, and so should brickmakers. If your burner smokes a pipe you will not be satisfied with his work. His tendency will be to fill up the furnaces with a large quantity of fresh coal, all thrown in at one round, and then sit and smoke while it burns down. This method of firing is just as objectionable as clinkering all the fires at once.

The proper way to fire is to put in a little coal at a time and often. This keeps the fires bright and steady at all times.

One fire may burn faster than others, and unless it is tended when needed time and heat will be lost. The fresh coal thrown upon the front of the grates cokes and the gas passes over the hot coals on the back of the grates and is burned. When the door is opened the next time around this coal, now coke, is pushed back and fresh coal placed on the front of the grate, which is the best cooking table on earth, because the gas passes the full length of the grate over the hot fire, and is burned before it passes into the kiln.

Watch that burner!

—That Furnace Door.—

Watch that furnace door. First make it as small as can be used and then keep it in order, so that it will close tightly. I saw cast-iron doors once on kilns. These doors had been each fitted with those circular dampers, so often seen on furnace doors, but the dampers had been lost off, and the burner was using the doors with those large holes open. Streams of cold air were rushing in through the holes, but the burner was too indifferent to repair the doors. He was thus wasting dollars' worth of coal.

In another place I saw kiln furnace doors made of brick hung in an iron frame. They were shattered and admitted great streams of cold air into the furnaces. The burner said they had been in good order when the kiln was started. The burning was pretty well advanced when I saw it, but the doors surely were not in good order then, when they were needed most.

Watch that burner!

—Daub Those Cracks.—

The same principles obtain in permanent kiln walls as are found in clamp kilns. Cracks admit streams of cold air into the kilns and should be carefully daubed. Before a kiln is set it should be carefully examined inside, and every crack closed. After the water smoke is off and the doors closed cold air begins to draw through the cracks in the walls. The outside of the kiln should now be searched, and every crack closed. As the kiln gets hot and expands cracks will open and should be closed from time to time. Much heat, coal and money can be saved to be added to the profits by keeping cold air currents out of burning kilns.

Watch that burner!

—Good Firing.—

The efficiency and value of a furnace will depend largely upon the way it is managed.

If it is well tended it will produce all the heat that could reasonably be expected of it.

Poor firing renders a furnace incapable of producing much heat. A certain amount of heat produced at definite temperatures within a given time will burn a kiln of brick. If the furnaces attached have the necessary capacity and are properly served they will generate the necessary heat. If they are neglected or fired by incompetent men and badly managed they will fail and larger furnace capacity and better fuel will be required to produce the amount of heat and the degrees of temperature needed. Thus, the number and size of furnaces necessary will depend largely upon the treatment they will receive.

Doubtless many good furnaces have been condemned and thrown out to be replaced by some patent affair simply because they were not well served and given fair treatment.

If the patent furnace gave better service it was probably because the instructions for managing it required good service.

Watch that burner!

Written for THE CLAY-WORKER.

BRICK PAVING IN DES MOINES.

By H. Foster Bain.

THE CAPITAL OF Iowa is one of the cities of the middle West which has made extensive use of brick as a paving material. Indeed, it has now nearly sixty miles of brick paved streets, and while it was not among the first to use brick, its experience has been long enough to thoroughly test the material, and valuable conclusions may be drawn from the present conditions of its streets. If one should question its citizens there would be a nearly unanimous expression in favor of brick as a paving material; and that, too, in the face of the fact that there are in Des Moines several pieces of brick paving that are about as bad as any that are to be seen in the West. It is not in ignorance of its faults, but with full knowledge of these, as well as of its virtues, that brick paving is recommended.

The reason for this unanimity of sentiment is in the fact that brick is clearly the material best adapted to the local conditions. In engineering works, as in nature, it is adaption to environment that produces lasting results. Of the principal paving materials now in use brick is not only the most suitable, but the most available at Des Moines, and, therefore, in spite of certain defects it has been very widely used, and in

One of Des Moines' First Brick Pavements.

the future, as in the past, is bound to control the local market. Des Moines is a rapidly growing city of some seventy-five thousand inhabitants, situated in the middle of a great prairie State. It is not as yet a great manufacturing point, though it gives promise of becoming such in the future. It is built at the intersection of two rivers, so that in laying out the streets relatively steep grades must be taken into account. There is little rock in the neighborhood, and lumber is expensive. Coal and clay are abundant within the city limits. All these conditions have fostered the growth of a big brick

industry, and now nearly $250,000 worth of clay goods are produced annually.

The fact that the street traffic was not of the heaviest, made it reasonable to put in brick paving at a time when the lasting qualities of that material under heavy traffic were not yet established. It is notable, however, that the first brick laid here were put on residence streets, while cedar block were laid on the business thoroughfares. That condition of things has long since changed, and now only a few of the block pavements are left, the remainder having been torn out and replaced by brick. The bulk of the population of Iowa is engaged in farming, and farmers have always been the conservative element. This conservatism and tendency to look closely at expense is reflected in the people of the cities, and in the present case has had the effect of shutting out the consideration of asphalt pavement as both experimental and expensive. It was recognized that whatever might be the merits of asphalt when plenty of money was available, it could not be considered here, and now, with our experience in making brick and laying pavement, we are not at all sure that asphalt has any substantial advantages over a well-laid, hard-filler brick pavement.

The high grades and the fact that the city was growing, and hence could not but expect to have its streets torn up occasionally for the laying of car tracks, water or gas pipes, etc., made it imperative that a block rather than a sheet pavement should be laid. This practically narrowed the choice to granite, brick, cedar block and macadam. The latter was clearly out of the question for anything but outside streets and as a temporary expedient. In all some 4,000 lineal feet of macadam was laid at an average cost of $1.94 per square yard. Later this served as a foundation for brick, and in that it found its greatest usefulness. Probably a larger amount of macadam would have been laid except for the fact that there are no quarries near the city, and all rock had to be shipped in thirty miles or more. Macadam when well laid and carefully cared for makes an excellent road, but the necessity for frequent repairs and almost continuous supervision is a decided disadvantage. It is much easier in a young city to obtain money for building new roads or buildings than for repairing old ones, and macadam must never be allowed to go without repairs for any length of time or it will deteriorate very rapidly.

Granite block has been out of the question in Des Moines because of its great expense. The nearest quarries are at Sioux Falls, S. D., Iron Mountain, Mo., and various points in northern Minnesota. Freight from any of these points, added to the original cost of the material, would make the cost more than a young city could stand. It was reasoned, too, that granite is very strong, and, in fact, is far stronger than the weight of the local traffic would demand. Later the roughness and consequent noise, the difficulty of keeping clean and the greater traction came to be regarded as serious objections.

1. Fourteenth Street, Looking North from Grand Ave. 2. Forest Ave. Laid in 1889. 3. Fifth Street, Laid in 1895. 4. Walnut Street, Des Moines's Main Business Street, Laid in 1893.

Cedar block was at first adopted, and a little over two miles of it were laid between the years 1882 and 1889. The average cost of this pavement was $1.61 per yard, and about one-eighth of the amount laid is still in use, though it is in a very bad condition. In general its life here was in the neighborhood of ten years. The objections to it are well known. Like all other pavements, its quality depends greatly upon the

care used in laying the work and in inspecting the material. It seems to have been especially difficult to obtain a good job in the laying of this pavement. Many of the failures here, however, as in the case of the earlier pavement, were due to the slight attention at first paid to the vital matter of foundation. Cedar blocks were almost universally laid on sand or board foundations, and without suitable under drainage. Particularly in the case of repairs the boards were not infrequently cut regardless of the effect in impairing the strength of the pavement. The result was that the blocks being improperly supported became pushed out of place, and were exposed to undue wear. The open porous character of the wood made them particularly objectionable from a sanitary point of view, and after a wooden pavement was worn a little it was practically impossible to keep it clean. It was, however, the short life of the pavement which caused it to be condemned.

The first brick pavements were laid in Des Moines in 1889, with imported brick, most of which, at least, came from St. Joseph, Mo. These brick were merely hard burned builders, and would be instantly rejected if offered now on any job. They were laid on a sand or board foundation, and on streets which have always had a fair amount of traffic.

The first, Fig. 1, is of a bit of pavement on Fourteenth street, looking north from Grand avenue. This work was finished in October, 1889, and cost $1.50 per yard. It is on a side street now little used. The brick show a bright red, and have evidently been vitrified very little if at all. The corners and edges are rounded, and there are great patches, as is shown in the picture, where the individual bricks can hardly be distinguished. They have been pounded to pieces by the horses' feet, and the present surface is made up of hammered brick, forming patches of brick macadam. This represents about the worst possible condition for a brick street. Yet the street is clean, dry and passable at all seasons. It will support heavy loads, and is not now as rough as granite when first laid or cedar block after half the wear. It is not a street that brick men can be proud of, but is interesting none the less.

Picture 2 shows a portion of Forest avenue, laid the same year, and with the same foundation, at a cost of $1.85 per yard. It has had much heavier traffic than Fourteenth street, and is not in so bad a condition. The extra cost is evidently reflected in the better character of the brick. They are harder and have not been pounded to pieces so badly, though they have been badly rounded. When a pavement is first laid the cracks between the brick are very narrow as compared with the width of the latter, and there lacks but little of being as much sand exposed here as brick surface. The edges of the brick in the pavement mentioned have been so thoroughly rounded that instead of the brick presenting a flat surface a mere ridge is exposed to further wear. In the case of a brick used twenty years at Bloomington, Ill., this wear amounted to 22 per cent. of the original width of the brick. The contrast between the old brick pavement and that now being laid is very marked. The pavement on Tenth street, beyond Forest avenue, was laid in 1895 of local brick, and is in excellent condition.

We also show one of the first pieces of work laid with local brick. It is from High street, in front of St. Ambrose Church, and was laid in 1892 with a sand foundation, at a cost of $1.56 a yard. It shows wear. and the street is uneven. The trouble here, however, is more the result of uneven settling in the foundation. The brick are worn, but are good for many years' service yet. The streets so far referred to are all of double course brick on an inadequate foundation.

Street car tracks introduce important complications in the matter of pavement. As the wheels of vehicles cross the rails they give a heavier blow to the brick near the latter, and it is not unusual to find deep ruts at such crossings when the rest of the street is yet smooth. Much may be done by carefully selecting the best brick for such situations. It seems probable, though, that laying them "herring bone" fashion would be a great help, though that would necessarily add to the cost of the work. The intersections shown were laid in 1897 on concrete with local brick, at a cost of $1.23 per yard.

In the larger cities there has been a disposition to restrict brick to the residence streets, and in Des Moines very satisfactory results have been obtained with it on such streets. In Figure 3 a residence street, Fifth, is shown. It is paved with two course work on sand, laid in 1895. Ninth street, where the pavement is still new, already shows the defects which come from the use of a sand filler, in that the seams are already gaping. It is impossible to lay brick with a soft filler so that they will not swim a little, and in the case of a light foundation this may in from five to ten years require the relaying of the work. The most of recent work in Des Moines has been put down with grout or Portland cement filler, and the results so far seem to more than justify the extra cost.

The business streets are now all paved with brick, and in Figure 4 the appearance of Walnut, the main business street, is shown. This pavement was laid in 1893 of brick made by the Des Moines Brick Manufacturing Company, at a cost of $1.70 a yard. The work is not up to the standard of that done lately by the same firm, and before the five years' guarantee ran out they found it necessary to repair certain portions. It is to be noted, though, that this street gets probably the heaviest traffic of any in town. Eighteen hundred and ninety-there was really the first year that paving brick were made in Des Moines on other than an experimental scale, though some local brick were used as early as 1891, and it is not surprising that these brick are not so good as are now turned out. The Des Moines Brick Manufacturing Company were the pioneers in the business here, and deserve great credit for their work. They rapidly built up a plant until it has an annual capacity of nearly 30,000,000. It was burned late in the season of 1898, and has not so far been rebuilt. The Flint and Iowa plants on the north side, and the Capital City and Merril plants on the south, are now supplying a portion of the trade.

The year 1898 was a bad one for the paving plants, and they very largely devoted their attention to the building trade as a result. The output and value of pavers alone for two years is given in the table below:

	No thousands.	Value.
1897	36,300	$238,434
1898	22,611	196,291

The manufacture of pavers affords an excellent supply for the best builders in the "seconds" from the paver kilns. These find a ready sale on the local market. The industry furnishes employment to a large number of laborers, a market for a considerable amount of coal, and a not inconsiderable amount of locally manufactured machinery, so that entirely aside from the numerous advantages that brick paving offers the industry is of substantial benefit to the city.

It may be of interest to note the prices at which brick pavement has been laid in Des Moines in recent years. The prices quoted below are averages by contract. They include all kinds of foundation, and both single and double course work. They have been influenced by the variation in price of cement and other material as well as of brick and by changes in methods of inspection. The higher prices of 1897 and 1898 are mainly the result of higher requirements in the quality of the work:

	Square yard.
1889	$1.66
1891	1.59
1892	1.62
1893	1.57
1894	1.57
1895	1.23
1896	1.29
1897	1.33
1898	1.31

The man never yet lived who was so valuable that the place he occupied could not be filled by another.—Exchange.

Written for THE CLAY-WORKER.

THE TRUSTS AND THE SMALL BRICK FACTORIES. III.

By L. C. Moore.

IN ORDER THAT the small factories may be able to compete with any and all forces, kilns and dryers of the best quality must be provided, kilns and dryers that will do the best work with the minimum amount of fuel and labor. What the proper construction of these kilns and dryers may be it perhaps remains for the future to determine. Whether up-draft, down-draft or continuous, whether to utilize the waste heat of the cooling kilns, natural air or steam, these are questions that we believe have not yet been solved to the satisfaction of our craft. But one thing is certain, there has been great advancement during the last few years in the matter of kilns, dryers, furnaces and methods of burning and drying, and the manufacturer with an obsolete outfit cannot be in the race. It often becomes a difficult problem to determine the economical value of some of our so-called improvements. We may economize in one direction and thereby lose in another. In order to utilize the heat of the sun or the waste heat of our plant, we may find the cost of construction and the daily labor connected with it more than commensurate with the good received.

One of our neighbors has a continuous kiln of small capacity, whose first cost was very great, while the cost of a constant attendant, the handling of the wares so hot, and other drawbacks more than consume the amount saved in fuel, for it is a great fuel saver. Another neighbor has a fan dryer utilizing the heat from the cooling kilns, that costs more to operate than is gained by using a force that was going to waste. All these problems must be solved, and some method adopted that is best fitted to the individual plant. Every element must be utilized, every energy conserved, and success is almost certain. Old ideas, as well as old-time appliances, are out of date. The brickmaker must begin now a course of study to improve his own mental equipment, or the wide-awake crowd that now jostle him at elbow and back will surely push him over the dump and cover him with the refuse from his own factory.

And now, an idea that may call forth criticism from other brickmakers. The small factories do have considerable advantage over the large establishments in the labor market. We do not pay as high wages as the larger factories, and we believe that, in spite of this fact, our laborers are better housed, clothed and fed than theirs. Many of our employes own little homes, with a small plot of ground, which is cultivated before and after working hours, thus affording a means of partial support, and the fact that they own a house and live rent free makes it possible for them to work for smaller wages than their brothers in the crowded cities, should it ever become necessary for the small factories to cut wages still lower in order to meet competition. The rural laborer is more economical than the city laborer, and the members of his family have better opportunities of rendering themselves independent of parental support, thus lifting a heavy burden from the bread-earner's shoulders. Besides, the personal relations of the brickmaker with his men becomes an incentive to labor, and more work per man will be accomplished than where the work is left to bosses of squads who seldom have the good of the company at heart. All these things are in favor of the small factory, and one more, which we consider the greatest of all. This is the matter of transportation. This gives the local manufacturer an advantage of from $1 to $3 per thousand over his foreign competitor when dealing with a market that is purely local, while he has the advantage of a short haul when he attempts to compete for the shipping trade within a small radius. The great weight of all clay products will always necessarily render transportation expensive, and this is perhaps the greatest protection that can be given to the small factories.

We firmly believe that these small brick factories will always be successful against any combination that may be made to force them out of existence, and we know of no investment that we would deem a safer one than the erection of a modern brick and tile plant to supply any territory that now needs such an enterprise.

Good business methods, an -up-to-date plant, plenty of fuel and good raw material make a combination that needs to fear no competition.

WILLIAM H. HUNT.

Newly Elected President of the Builders' Exchange, Cleveland.

A BRICKMAKER who finds time to take a hand in matters of a civic and public nature, and who in recent years has come rapidly to the front as a man of affairs, is William H. Hunt, general manager of the Cleveland Hydraulic Press Brick Company. Mr. Hunt has just been honored by election to the presidency of the Builders' Exchange, of Cleveland, one of the best and most successful institutions of its kind in the country. The exchange numbers upwards of two hundred and fifty of the leading contractors and material dealers of the new metropolis of Ohio, and the distinction of standing at its head is no mean thing.

The election of members of the board of directors was held on November 5, twenty candidates having been chosen by the nominating committee, and an official ballot having been prepared. The voting began at 11 o'clock, and proceeded in a lively manner until 8 o'clock in the evening. The ten members receiving the highest number of votes were declared elected. Mr. Hunt was among the first, and when the new board met to choose officers he was unanimously selected as president. The new board comprises the following: William H. Hunt, president; William Downie, vice-president; E. W. Palmer, treasurer; Edward A. Roberts, secretary; J. W. Conger, E. H. Towson, Arthur Bradley, Sherman Watterson, W. F. Billenstein, C. W. McCormick, George Caunter.

William H. Hunt, President Builders' Exchange, Cleveland.

Mr. Hunt spent his early youth at Akron, serving as teller in the First National Bank, and being engaged in various manufacturing enterprises. He embarked in the brick business in 1893 with the Akron Hydraulic Press Brick Co., and rapidly rose to his present position. He has traveled extensively, and has in his possession many relics accumulated on his trips, including a variety of Pompeiian brick, which have been exhibited at various times, and are contained in a handsome case in the rooms of the Builders' Exchange at Cleveland. Last year he was elected a director of the Cleveland Chamber of Commerce, and is at present a member of the executive committee of that body. He is a progressive manufacturer, a creator of bright ideas, a great social favorite with his friends, and a marked success generally.

WRITTEN FOR THE CLAY-WORKER.

HOOSIER CLAY METROPOLIS.

UCH IS THE NAME applied to Brazil, and why should it not be. Two paving brick factories, two sewer pipe works, one building brick plant and two hollow brick works, one of which manufactures conduits, make up the list of clayworking industries. Three railroads, furnishing direct lines to Chicago, Indianapolis and the Indiana gas belt, make the facilities for transportation exceptionally desirable. Half a dozen kinds of raw material, including fire and plastic clays, as well as numerous shales, are all that could be desired in that line, while for fuel they have the world-renowned Brazil block coal. Not only are paving brick manufactured there, but they are used in quantities as well. One of the finest streets, Meridian, is paved to the city limits, and on this street begun the first trip to the clay works. Stopping at the edge of the city at the Monarch Sewer Pipe Works, a few minutes were pleasantly spent with its manager, Mr. J. O. Freeman, when camera and note book were gathered up and the road paralleling the C. & E. I. tracks past the mammoth plant of the Brazil Brick and Pipe Company brought me to the

—Sheridan Brick Works.—

Wm Hendrix, Superintendent Sheridan Brick works.

This plant was built in 1898 by the company which has for some years been operating the Sheridan Brick Works at Sheridan, Ind., and of which Mr. M. J. Osgood is president and Mr. C. J. Root secretary and treasurer. Mr. William Hendrix, superintendent, extended a welcome hand, and began at once to point out the numerous advantages of the Sheridan over other works of its class. As usual, our first duty was to give our attention to the shale pit, which is about 150 yards from the main building. The vein of shale is about 22 feet in depth, overlaid by about 5 feet of plastic clay, while under the shale is a vein of coal about one foot in thickness. Both the shale and clay are used, since the shale alone does not produce such a good color as when a small portion of the clay is added. The coal is of a good quality, and used at either the boilers or the kilns, which are of the Swift pattern. A double tramway leads from the pit to the main building, while another tramway runs from the bottom to the top of the pit. On this the clay is brought down to the first tramway, the loaded car pulling up the empty one. The cars on the main tramway are operated by a double winding drum, the design of which is credited to Mr. Osgood. It is so arranged that the cars on the two tracks are operated entirely independent of each other, so that both may be let down or pulled up at the same time, or one let down and the other pulled up. At the top of the hill the descent becomes steeper, and here is a turn in the tracks which enables the operator of the drum to watch the car on its entire journey. The cars in which the shale is loaded were also designed by Mr. Osgood. They dump from both sides by simply releasing a catch, and no tipping of the car is required.

On entering the boiler room we found five boilers of sixty-horse power each, and in the adjoining room a 150-horse power Atlas engine. The shale is ground in a Woolley dry pan, elevated to an ordinary slanting screen and thrown into a Potts soft mud machine. Besides the Potts machine, which has a capacity of 35,000 per day, there is also a Woolley machine with the same capacity, which has not been operated this year. On the Potts machine 5,069,000 brick were turned out in the six months ending September 15, with only one dry pan in operation. The Sheridan works boast of the largest Standard dryer in the country, 24 tracks, with a capacity of

The Shale Bank.

about 160,000 bricks, thus giving them 48 hours in which to dry when both machines are running.

There are seven Swift kilns, all equipped with the slack coal coking table furnace fire boxes. Each of the kilns has a capacity of 400,000, the brick being set 42 high, and, what is more remarkable, they are burned to the top. The kilns are arranged in a double row, on both sides of which are switches for unloading purposes, and along which are permanent runs of sufficient width for wheelers to pass. Between the two rows of kilns is a switch used exclusively for coal. From the coal switch there are tramways on both sides of each kiln, with cars into which the coal is loaded and distributed to the different boxes. One of the switches is from the Vandalia, and one from the C. & E. I., while the other is a union switch.

A Load of Shale on the Way Up.

All men are paid by the day, though the larger part of them are assigned so much for a day's work. At the machines 35,000 brick constitute a day's work, while the setters, of course, do the same amount. In order to keep an exact count of the number made and set, which any of the readers know

is a very hard matter, all of the 400 dryer cars are numbered, and a card bearing these numbers is sent each morning to the machine as well as to the kiln, and each car is checked as it is loaded or set. For one day's work the wheelers handle 9,000 brick. Each wheeler has a card in the car into which he is wheeling, and marks each load, thus keeping the number loaded as well as the number for which he should be credited. The brick made weigh five and three-quarter pounds, and are used in many cities in Indiana and eastern Illinois, though principally in Indianapolis. Though the brick they now ship burns to a cherry red, they have material which burns to a cream color.

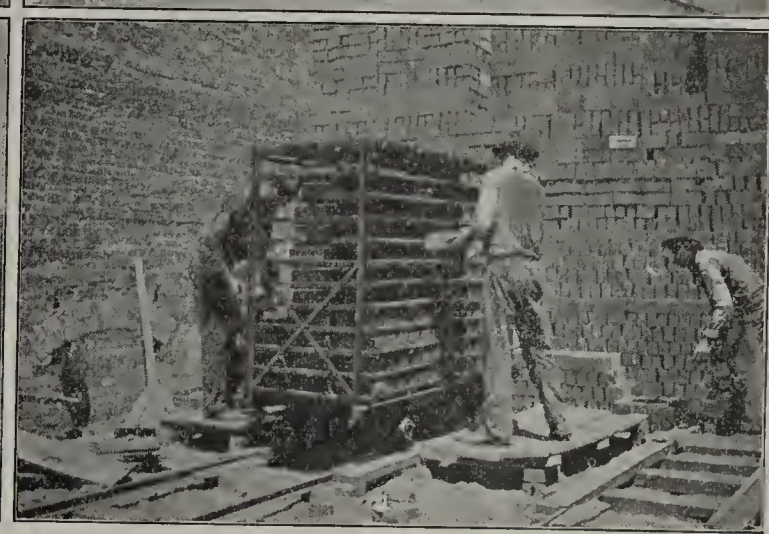
Mr. Hendrix believes that cleanliness is next to godliness, and so has for the employes a bathhouse supplied with both hot and cold water. Here, on coming to work, working clothes are donned, and on leaving they are, for the most part, left at the works. Mr. Hendrix also showed where another of his ideas had been put in practice—that of drying sand by steam. Under a box with sheet iron bottom are coils of steam pipe, and in this way the sand is dried better and in shorter time than by the old way. On leaving the Sheridan works a cordial invitation to return was extended, and it is certain that any brickmaker would not only profit by a visit to the Sheridan, but would also say that no man ever took more interest in acquainting foreigners with his plant than does William Hendrix.

—The Excelsior Clay Works—

Was the next plant to attract my attention, and, though it is not as large as the others, has an excellent opportunity to become a model plant. Its president, Mr. George Brandenburg, extended a welcome hand, and, on learning the object of my visit, began without delay to point out first the many natural advantages possessed by their 47 acres of Clay county soil. Two small slope mines within a few hundred feet of the main building produce an excellent quality of Brazil block coal at a very low price. The miners are paid by the ton on a mine run basis, which coal is used exclusively. For distributing the coal to various points on the yards there are a number of tracks which accommodate the cars used in the mine, and on which the coal is hauled. Besides the coal they have fire clay, sand, their own timber for props, and the shale and clay used in the manufacture of their product.

The shale pit is about 200 yards from the main building, the shale being loaded in dump cars and pulled by a winding drum. The vein of shale worked is about 30 feet in thickness overlain by a few feet of yellow clay and some soil. The soil is hauled away and used in enlarging ponds from which the plant obtains its water supply. The shale is gray in color, and burns to a dark red.

The main building was built with the intention of increasing the plant's capacity at an early day, and hence they are not crowded in it, as is too frequently the case. The power is furnished by an engine of 150-horse power, for which steam is supplied by two boilers of 100-horse power each. The dry pan and pug mill were both made by the Bonnot Company, while they have a Hoosier machine with Frey-Sheckler hand-power cutting table. About twenty thousand block are sent through the Penfield repress each day, while those that cannot be repressed are set in the bottoms of the kilns and sold for sewer, sidewalk and building purposes. They have also a Centennial machine for making hollow building tile, and a rock-faced die for same. A Cunningham automatic cutting table is not now in use. Loaded on the Bonnot Company's cars the block are pushed into a Standard dryer of four tracks, which is of sufficient capacity to allow the brick 36 hours in which to dry. There are four kilns, each having a capacity of fifty thousand block. The stacks are built of hollow building block, and are standing remarkably well.

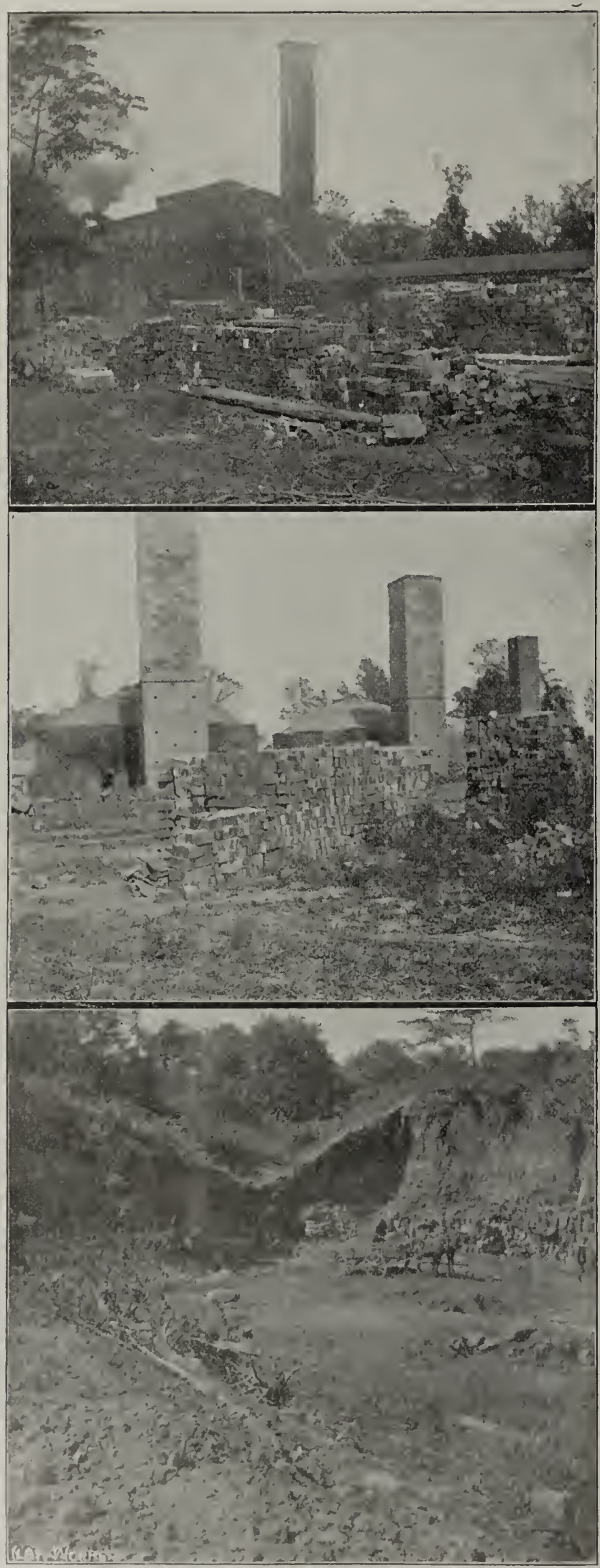


Getting in the Clay. From Dryer to Kiln. Ready for Business. Setting in a New Kiln.

The Excelsior block are 2½ by 4¼ by 9 inches, though it is the intention to make them only four inches wide, since they will be no less valuable and require much less material. At present all of their product is being used in Brazil, and they have sufficient contracts there to keep them busy for some time. Besides the block they turn out flue lining, hollow building block, plain and rock-faced, sidewalk and sewer brick. About 45 men are employed, and are paid weekly, in accordance with the Indiana law. The water supply is obtained from three ponds belonging to the concern, while fire protection is

afforded by hydrants at several places on the yards, and good hose, which is kept ready for use. The switch to the works is from the C. & S. E. R. R. The main office of the concern is at Brazil.

Mr. Brandenburg, though a new member of the craft, is a most enthusiastic one. He says that the paving brick business is better now than it has ever been, the outlook for next year is still better, and, if the prospect at the close of the season is for a continuance of the prosperity, the first year of the twentieth century will find the Excelsior Clay Works twice its former size.



Shale Bank and Works of Excelsior Clay Works, Brazil, Ind.

—Indiana Paving Brick and Block Plant.—

This is the oldest of Brazil's brick works, having been built in 1891 by the Indiana Paving Brick Company. Later it was sold to the Indiana Bermulez Asphalt Company, and in 1899 was bought by the present proprietor, W. W. Winslow, of Indianapolis. The plant is now in charge of Thomas Proud and Mr. B. F. Roberts, Mr. Proud having charge of the yard and burning, and Mr. Roberts of the factory proper. The works are situated at the west limits of the city and the Vandalia Railroad.

The shale is obtained about two miles north of the city, on Otter creek, just north of the Sheridan Brick Works. It is practically the same shale as used at the other plants. By blasting and undermining the shale is brought to the surface, when it is loaded in dumping cars and pushed a short distance to the switch. The cars into which it is here loaded are switched to the works and set at the side of the dry pans. The shale alone, however, is not satisfactory for the manufacture of pavers, so yellow clay is added in the proportion of two parts of shale to one of clay. The clay is obtained within fifty yards of the factory and pulled to same by a winding drum and cable.

The main building is an exceptionally large one, since it was the original intention of the former owners to make sewer pipe instead of paving brick, hence the dryers are inclosed by the building. There are two dry pans, one nine-foot Freese pan and one seven-foot American pan. Leading to each of these pans is a chute into which the shale is shoveled from the cars. After being ground the material is run through a slanting screen into a Freese pug mill, while the column is formed by a brick machine of the same make. A Frey-Sheckler cutting table is in use, and two represses, one a Columbian, the other an Eagle, put on the finishing touches. The power is furnished by an Atlas engine of 160-horse power, depending, together with the dryers, on four boilers of 50-horse power each. This machinery turns out each day 25,000 block, which, when burned, are 3½ by 4 by 9 inches.

As before stated, the dryers, including the return tracks, etc., are built inside the large building. There are two dryers, both Standards, containing nine tracks. There is now being built, under the direction of Mr. Proud, a hot air dryer of two tracks. For the present the heat will be obtained from slack coal, but later on the three dryers will be connected, and all heated by the waste heat from the kilns, probably by the use of a tunnel or pipe to which will be connected a fan operated by an independent fan engine.

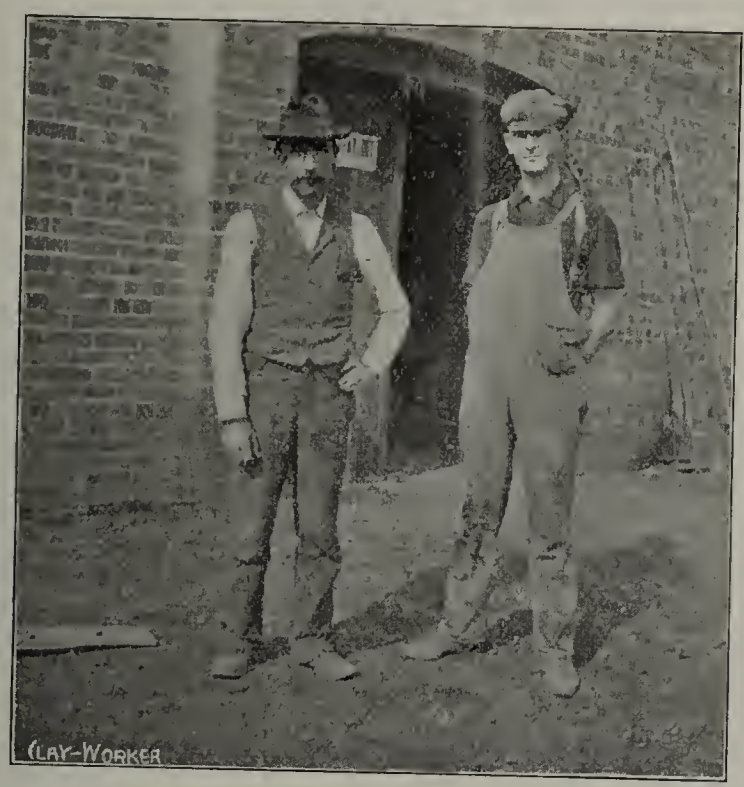
There are 13 round down-draft kilns, including one Eudaly, the others having been constructed according to their own ideas. All the kilns will soon be fitted with a solid bottom, whose design is claimed by Mr. Proud, and which has already been tried in a few of them. Piers are built which are 18 inches in width, leaving between each two piers a space of about 4 inches. The small flues thus formed join in the main flue, meeting it at right angles. It is useless to mention the numerous advantages of the solid bottom, but is sufficient to say that these are giving satisfaction by burning the block more uniformly, to say nothing of the saving in time, fuel and the time and labor required to clean the open floors.

The chief product of this plant is the Indiana block, 3½ by 4 by 9 inches, though brick are made for use in the streets of Brazil. The annual capacity of the plant is about seven millions, and the territory into which they are shipped covers the greater part of two States and smaller parts of others. Besides the paving material they make on special occasions a face brick which is really nothing more than a paver, though not repressed, burned to dark brown or chocolate color. The square edges, of course, form a better mortar joint than those

of the repressed brick. One of the principal qualities of this brick seem to be its rough face, which is now being favored by many architects. Last year these brick were furnished for the new agricultural hall of the University of Illinois and many other public buildings.

About sixty men are employed, most of them having a certain amount of work for a day. The machine men must turn out sixty cars, while the wheelers must handle 5,000 brick each day, one pitcher or sorter having charge of two wheelers. City water, with various hydrants, affords fire protection for the plant. The main office is in Indianapolis.

In conclusion, it may be said that Brazil is certainly a clayworking town. While it has its mines, steel mills, etc., there are by far more clayworking industries, and representing more branches of the industry, as well as the one which manufactures clayworking machinery, than at any other place in Indiana. While all the clay works have been built in the last decade, with one exception, I believe a majority of them have been built by foreign parties, who were quick to take advantage of such a desirable place. At any rate, there are a number of interesting clay works besides the brick plants which



Thos. Proud and B. F Roberts, Indiana Paving Brick and Block Plant.

have been here described—only too briefly—and from which any clayworker would not fail to learn many valuable things.

A HOOSIER.

THE CAUSE OF LABOR TROUBLES.

Employers have themselves to blame in many instances for the exceeding bitterness of the quarrels in which they find themselves involved, and it is to this phase of the question that we wish to call attention. That labor is often unreasonable and sometimes unnecessarily offensive in the method of making its demand, is true. The best way in which to eliminate this element of needless friction from the relations of employers and wage earners is to avoid giving any excuse for it. To employers who note with more or less anxiety the increasing restlessness of labor, and who look forward to the materialization in the near future of the nebulous issues which have been for a year or more shaping, we commend the sage advice of the philosophical humorist, Josh Billings, to the effect that when you have made up your mind to "take the bull by the horns," stop and consider whether it is not wise to take him by the tail instead. There is much practical wisdom in this pleasantry, and the manager of industrial operations who has to deal with the ever changing phases of the labor movement should keep it in mind. An effort to ascertain on what points agreement is possible often permits the irreconcilable points of difference to be brushed aside as negligible. When this effort is made courteously, patiently and in evident good faith, agreements are seldom difficult to reach.—Carpentry and Building.

THE KAOLINS AND FIRE CLAYS IN EUROPE. II.

By Heinrich Ries.

(Abstract of article in Annual Report of U. S. Geological Survey. Revised for the Clay-Worker by the Author.

—Methods of Porcelain Manufacture.—

THOUGH the methods used are essentially the same as those seen in this country, there are certain branches which are specially well developed. Curiously enough one or two large German works still use the old-fashioned potters kick wheel, but most of the European factories have machinery operated by steam power. The potteries at Limoges, France, and Copenhagen, Denmark, are especially well equipped. Of interest is the form of wheel used for molding oval or elliptical plates and platters. These machines are also manufactured by Mr. P. Faure, at Limoges.

Casting is far more extensively used abroad than in the United States, both for porcelain and granite ware, objects with a thickness of one-quarter inch when burned being formed by this method. It is usually found that if about 2 per cent. by weight of calcined soda is added to the charge, only about one-quarter to one-third the amount of water than would otherwise be necessary is needed to give a slip of the proper consistency. At some works this slip is mixed in a vat and poured into cans for use. At others a pipe leads directly from the vat to the casting table.

The temperatures attained in burning porcelain vary considerably. At Berlin the porcelain is generally burned at a temperature sufficient to melt cone 18 of Seger's series. At Copenhagen cone 26 is used for hard firing. Seger has shown, however, that it is possible to make a porcelain which can be burned at cone 9.

The manufacture of ornamental stoneware has reached an enormous development in both England and Germany, and the works of Villeroy & Boch and Doulton are mentioned under their respective countries.

At the present day Vallendar, Bunzlau, and Hohr Grenzhausen are important centers of the German stoneware industry.

The clays used are very plastic and moderately refractory. Their percentage of ferric oxide varies,, so that the clay may burn from a whitish-yellow to a brown. The whitish-yellow clays, of which those from the Westerwald district may be taken as the type, are especially valued. They are free from carbonate of lime, but have an appreciable amount of alkaline silicates. These alkaline fluxes tend to widen the distance between the points of vitrification or clinkering, and viscosity. These clays generally fail or flow at about cone 26.

The shade they develop in burning is often of little importance, for owing to the engobe covering or other decoration the color of the body is seldom seen.

In Germany excellent stoneware clays occur in the Rhine district, in Nassau, along the Elbe river, and others are found in Bohemia.

Numerous analyses are given in the tables further on, but two additional examples of stoneware clays analyzed by Hecht may be quoted here:

—Analyses of German Stoneware Clays.—

Ultimate Analyses.	1	2
	Per cent.	Per cent.
SiO_2	50.42	72.54
Al_2O_3	36.57	20.03
Fe_2O_3	1.30	1.29
CaO	1.57	.54
MgO	.51	.93
K_2O	.49	1.20
H_2O	9.63	4.02
Total	100.49	100.55

[1] Sprechsaal, 1896, No. 29, p. 812.
[2] Seventeenth Ann. Rept. U. S. Geol. Survey, Pt. IV, p. 850.

Rational Analyses.

Clay substance	93.41	51.39
Quartz	5.84	47.05
Feldspar	.75	1.16

1. From Valendar, near Coblentz.
2. From Bendorf, on the Rhine.

A mixture of clays is used in most instances.

The ware is glazed either in burning with salt or when green. Slip glazes are frequently applied, and, as calcareous clays abound, they are generally used. The marly clay from Velten, near Berlin, will serve as a good example of this type (see table of analyses. Blast-furnace slag or lead is sometimes added to the glaze clay.

The higher grades of stoneware, especially those which are to be colored, are generally made from white burning clays, with the addition of kaolin. For this purpose the plastic clays of Vallendar, Hohr, Ebernhahn, and Lothain are used. Some of these are so plastic and shrink to such an extent in burning as to require the addition of grog. Sometimes the color is added only to a part of the clay, which is flowed over the surface of the ware. In this case it is important that the slip clay and the body should have the same shrinkage in burning. This is usually brought about by having the two of the same rational composition.

Calcareous clays abound in Europe, especially in northern Prussia, and, aside from their application to brick manufacture, they are abundantly utilized in the production of majolica wares. They usually run high in lime, and sometimes more is added. Red burning clays are often taken, and, after having the stones washed out, lime and sand are mixed in. The sand serves as a grog and the lime tends to make the body receive the glaze with less danger of cracking. Sometimes marl is used instead of sand and lime. The body generally has more than 25 per cent. of carbonate of lime, and may have even 40 per cent.

The majolica and earthenware made from these calcareous clays are usually fired at about 1,700 degrees F., and the glaze is burned on at the same temperature. In burning, both the glazed and unglazed wares are put in the same kiln, but the latter are put nearer to the point of exit of the fire so that the dampness from them shall not pass over the glazed pieces, for it would cause the latter to peel. The burned ware is still soft enough to be scratched slightly with a knife.

WRITTEN FOR THE CLAY-WORKER.

SOUTHERN CALIFORNIA BRICKMAKING AND BRICKMAKERS.

—Second Paper.—

TURNING OUR FACES eastward and crossing the broad bed of the Los Angeles river—a mere brook a month or more in the year, if we take account only of what appears on the surface—as its waters have largely been diverted at points higher up and utilized to meet the city's requirements. We ascend the bluffs which lie a little distance from the river, and as we emerge on the old Mission road we catch a glimpse of another continuous kiln with machine house and outlying drying sheds. These proved to be the east side works of the City Brick Company, whose works on the west side have already been described. The works are so similar as to kiln, power, etc., as well as in the general character of the product to that of the west side works, that we need not repeat our description.

The same use of electricity as a power and the same kind of fuel is employed. The works are located in a valley which runs through the twelve acres attached to the plant, so that the clay, the banks of which arise some twenty feet or more, is drawn by dump carts by a level haul to the crusher. We notice two things here which have not appeared in the other works mentioned. First, the clay is of a different character No shale here, but a reddish adobe, with here and there a veining or pocket of richer clay bordering on the blue. No stripping is required, and the twenty foot or so of bench worked includes at its base a foot or two of bank sand, which is found desirable for mixing. Second, we notice that as each cart of clay passes a heap of coal slack located on its line of travel a bucket of the same is scooped up by the driver and is thrown into the hopper, into which the clay is dumped at the crusher. Here, too, we noticed substantial sheds were being erected in which to store a surplus of dried brick for burning later in the season, as the machine product is in excess of the kiln capacity—36,500 daily. There is ordinarily scarcely any interruption to brickmaking arising from weather conditions in this climate. The drying is done on pallets under light sheds of the character shown in the illustration of the City Brick Company's works in our last paper. Superintendent Oxby advised us that six to seven thousand brick are burned by them in the use of a ton of slack. This, we think, will be deemed good practice anywhere. The bricks are what may be called hard burned, hardly any salmon and a notable absence of bats. Here we stop to refer to what was notable to us, the almost perfect order of all the yards visited by us. No waste heaps, no rubbish and no "grave yards" of discarded machinery or appliances so often found in connection with similar plants. No doubt this habit of cleanliness is greatly encouraged by the fact that in a country where there being no rain fall for six months or more each year, it is possible to keep the roadways and alleys as smooth as a floor—smooth enough to sweep anywhere. The thought did occur to us, however, that in the use of a tank of oil dust might also be largely dis-

Machine Building, Pacific Brick Company.

pensed with, but in this regard also the yards will rank with the best to be found anywhere.

Proceeding southward on the Mission road another mile, and we reach the plant of the Pacific Brick Company, over which our friend and escort presided.

A tract of ten acres beautifully located on a bluff of perhaps fifty feet in height, and possibly sixty to seventy feet above the river—being a portion of that section of the city known as Boyle Heights—overlooking much of the city of Los Angeles, and taking in all its business section with its background of hills. This may serve as a description for the location. It hurt what was esthetic in us to think what a beautiful location for homes was being given up and despoiled in the interest of an industry which is not supposed to add beauty to a neighborhood, but there is some consolation in the thought that the employment given adds comfort to many homes elsewhere, if not so beautifully located, and the further thought that these beautiful bluffs are being pitted, scarred and leveled that proud structures, rising story upon story, may arise elsewhere. We found before we left the ground that there was real value to the location for the business of brickmaking in other regards, and on a hot summer day we caught the unobstructed ocean breeze which prevails from morning till sunset, we said, "What a comfortable place to work," and then noticed that we were about opposite the center of population, with a

gentle down-hill haul to the business section. These works presented what we had not seen elsewhere. In place of the continuous we found the scove kiln. One has only to glance at the snap shot we took of one of these to accept our verdict of "workmanlike." The capacity of these kilns is about 200,000 each, and the burning is done with oil in three days from the lighting of the fires, the amount of oil used being about one and a half barrels to each thousand of brick.

Entering a kiln which had been opened we found what would

Simon's Off-Bearing Truck.

satisfy the most exacting, uniformly hard burned, square cornered brick, that rang like a bell as our chaperone converted them into cymbals.

Our attention was called to the fact that in and adjacent to the arches these brick had taken on a blue shade, and we were subsequently shown as we drove back to the city a building going up in which these blue brick were being used for belt and trimming courses, and was told that they were carefully sorted out for uniformity or color for such purpose, and brought a price double that of other brick. To secure such a result some brick are likely to be overburned, but even these, though having under the ordeal of fire lost their shape somewhat, were in demand at an enhanced price on account of color and fracture, showing when broke a vitrified face. The burning, both at these works and at Pasadena, where the works are of the same character is always done, night and day, under the watchful eye of one of the three Simons brothers.

The clay employed here has distinct characteristics which permit of the fire treatment accorded it, and insures the color mentioned when extremely hard burned, all of which is converted into extra profits by its wide awake owners. The clay is taken from the exposed bluff side overlooking the river, and is by power drawn up on incline to the crusher, which is located above the machine with an intervening screen. The crusher and iron machine are both of the Potts make. The building containing the machinery is housed in an open building well adapted to the climatic conditions, and which is shown in an engraving which is presented. Such open construction brings comfort to the busy worker any day in the year. We regret the cut does not more distinctly show the machine and the men about it, but it was taken just as the day's work ended.

We have before referred to the fact that when the head of this concern wants anything out of the usual order he devises it. In a workshop adjacent to the engine room (the engine is 30-horse power Chandler & Taylor) his inventions take form. The dump car which brings clay to the crusher discharges its load and is released for its return trip without the intervention of human fingers. The dump wagon we have already shown, and the car transferring device has been mentioned. We now show a carrying-off truck, which is another of his devices. In it the many springs shown (one for each pallet) in a photo before presented are dispensed with on account of expense, and a pair of springs are made to take their place. The body of this truck has a give and take in all directions, and is thus devoid of jar to the load it carries. Questioning Mr. Simons as to its value as a money saver, he convinced me that on his daily output of about 36,000 brick the saving was to him about 10 cents per thousand, and he added "the usual method of bearing off is hard work, and we had more dimculty in keeping such places filled and more changes occurred than in other departments of labor.

This leads us to a presentation of the matter of labor as we find it in connection with brickmaking establishments. The hours of labor run from eight to eight and a half hours per day, and the wages paid are as follows: Yard men and men at the clay banks, as well as teamsters, $1.75 per day; men at machines the same; pitchers are paid $2.00; setters, $2.50, and burners, $2.50. Some few boys are employed whose pay runs from 75 cents to $1.25 per day. There are two methods of handling labor. The one which is adopted by the Simons Bros. is, as we recall it, about as follows: The daily output is set at 36,500 brick, and the producing of this quantity constitutes a day's work, whether done in eight or eight and a half hours. The men who deliver the clay at the machine constitute one gang, and for the delivery of clay to produce the given number of brick they are paid a given sum, which nets each workman in that line the daily payment of $1.75. The machine men, which includes the carrying to dry sheds, makes up the next gang, and they are treated in a similar manner with the net result of daily pay already given. The same is true of the third gang, which includes all kiln work.

In the case of the firm under discussion the settlements are made with each of the three divisions, who adjust payment to each individual themselves, while in the case of some of the other concerns the settlements are made with individuals, and not with any body of them associated. In each case we are told the method works very satisfactorily. It will be apprehended that in the dealing with gangs instead of individuals there must needs be some head to each, and that there must be some method among themselves of filling vacancies and meeting emergencies which would otherwise need to be met by the proprietor, and that he is thus measurably relieved from details and care of administration. This feature we did not

Kiln of Pacific Brick Co., Los Angeles, Cal.

discuss with Mr. Simons. We got from him the opinion that more work was accomplished in a given time by labor in Los Angeles brick yards than is common in other sections of the country. This question each party engaged in the manufacture of bricks on the same general lines elsewhere can determine for himself. Perhaps one other statement made here will furnish food for thought, and may be made a further basis

for comparison. The Pacific Brick Company, with an average of twenty-six men employed eight and eight and a half hours per day, turns out a daily product of 36,500 high grade sand molded brick. We do not know how far behind the times the man may be who, having a wide experience in Ohio, told the writer that a safe method of estimating the help required for a given output was one man to each thousand bricks, and this was on the basis of a ten-hour day.

(To be continued.)

WRITTEN FOR THE CLAY-WORKER.

CAPITAL BRICK AND BUILDING NEWS.

—The Nation's Brick and Marble Edifice.—

IN A FORMER NUMBER of The Clay-Worker brief mention of the Capitol at Washington was made, in connection with important improvements there. I now wish to give some interesting facts, "material" and historical, which, at this time, are of peculiar worth on account of the centennial celebration of the establishment of the seat of national government at its present location, soon to take place.

I may say that, as a rule, when you come to look closely into most things structural, you find brick playing a very substantial part. And this is true of the subject in hand. It is not at all well known that the United States Capitol is composed in large part of bricks, but such is the fact. Many of the inner arches are built of this clay product and the building is lined throughout with it; besides partitions of rooms, etc., ranging in thickness from a few inches to six feet, are also of brick. Of course, all the outer part of the building is of marble and sandstone—the latter in the older portion—which gives the chaste, white effect in keeping with the majesty of such an edifice.

From recent investigations into the "brick side" of the Capitol, taking the number of rooms (over 200) as a basis of estimate and adding portions of corridor space, I have concluded that the bricks in the huge structure number over 15,000,000. In this estimate are included 1,700,000 brick used in the recent addition of rooms in the west front, where was the old quarters of the Congressional Library. There will also be employed for the air-shaft, near the new rooms, 150,000 white enamel brick, made in New Jersey and costing the government $70 per thousand for best quality and $45 per thousand for second quality. These brick are as good, if not better, than the foreign product.

Our brick and stone Capitol, the finest specimen of public architecture in America, had its cornerstone laid on September 18, 1793. President Washington officiated, and the event was attended with masonic ceremonies. The north wing was finished in 1800, and the present Supreme Court room and law library room below were fitted up for the Senate and House respectively.

At this date the "city" was in very "small clothes," for we find that on May 15, 1800, the number of brick houses at the Capital was 109; of wood, 263. A year and a half later saw 84 brick and 151 wooden structures added to the city, which was "growing rapidly—in an arboreal way. But if the new seat of government was a small affair, the government itself was "no great shakes." In fact, when the "seat" left Philadelphia for Washington, in October, 1800, the records, archives and furniture were all embarked on a small sloop, which, if it were now afloat, could not carry the money owned by Uncle Sam. O great and glorious ship of state, sail on upon the sea of your magnificent destiny! You will never strike your colors as long as there is a shot in the lockers.

The south wing of the old Capitol was completed in 1811, and this was connected with the north wing by a wooden passage. On August 24, 1814, the British destroyed the interior of both wings by fire. In 1818, the central portion was commenced, and the whole of the original building was completed in 1827. The cost, including work on grounds, was $2,433,844.13. It is probable that the grounds required much straightening up, for many of the brick used in the edifice were made there.

On July 4, 1851, the cornerstone of the new extension was laid, by President Fillmore, the chief orator of the occasion being Daniel Webster. This work was begun under direction of Architect Thomas U. Walter and finished under Edward Clark, present architect of the Capitol.

In size this ideal national edifice dwarfs everything architectural in the District of Columbia. It is 751 feet, 4 inches, in length, 350 feet in greatest width and covers an area of 153,112 square feet. The dome of the old building was of wood, replaced by the present cast iron structure, which was completed in 1865. The weight of the dome's iron is 8,909,200 pounds, and that of the statue of Freedom, which surmounts it, 14,985 pounds. The statue is 19 feet, 6 inches, high, and the height of the dome, from the base line of the east front, is 287 feet, 5 inches; greatest diameter of base, 135 feet, 5 inches. The rotunda is 95 feet 6 inches in diameter, and height from floor to top of canopy is 180 feet.

Where the greatest of lawmaking bodies sit is the Senate Chamber, which is 113 feet, 3 inches in length; 80 feet, 3 inches wide, and 36 feet high. The galleries seat 1,000 people. The Hall of Representatives is 139 feet long, 93 feet wide and 36 feet high.

The cost of the Capitol as it now stands, with all its art treasure, machinery, etc., amounts to about what Uncle Sam paid Spain for the Philippine Islands—$20,000,000. Of the works of art, the paintings in the rotunda alone cost $74,000, which amount does not include the canopy allegorical decoration and the historical chiaro oscuro strip around the rotunda's lower middle portion. Elsewhere in the building are paintings aggregating in value many thousands of dollars, and cost of the statuary foots up more than $325,000.

Not the least expensive and interesting part of the Capitol's equipment is in the sub-basement, where unadorned, huge brick walls can be seen in all directions, and where are many rooms and bewildering passageways. Down here there is a strange combination of luxury and mechanical arrangement for power making. The luxury features pertain to the personal comfort and health of the solons, and consist of fine bath-rooms, in which are marble and poreclain tubs and arrangements for hot and cold baths, steam and shower baths, massage and the application of electricity. By sitting in a box, with his head sticking out of a hole in the top, the solon on the Senate side of the building can, at one process, be steamed and have his ills routed by electricity.

On the House side, the bath-room attendant will show you the long, sarcophagus-like marble bath tub used by President McKinley when he was a member of Congress. He (the attendant, a Hercules in size) will also tell you, in describing his work, that often, when a member goes below for a general clean-up he leaves the job entirely in the hands of the cuticle laundryman. Hercules overhauls his congressional shallow-water craft from keel to truck. He then lifts him gently out of the deep, carries him to the dry-dock—a low, wooden resting place—and, after a good swabbing, leaves him to dream at ease of the days when he bathed in a mudhole—in the time of youth. It is not at all "bad" to be a Congressman, unless one is a bad Congressman. Even in the latter case he is just as well taken care of, for, strange but true, Uncle Sam does not pay people to be good.

In this electric age it is right that the machinery of the United States Capitol should be run by the electric current. Congressmen, it is true, cannot be run by it, but if they could be the arrangement would be excellent—for the constituent, who would simply touch the long-distance button; the M. C. could then "do the rest," after being touched up. Now, electricity turns the huge fans that send from below streams of fresh air to the legislative chambers, committee rooms, corri-

dors, etc. The atmosphere, charged with various kinds of lung exhalations, mixed with many kinds of eloquence, pours out through the roof, by aid of an electric exhaust fan located there. The elevators are operated by means of the subtle current, and the whole building is lighted by it, requiring over 8,000 lamps for this purpose.

In many places in the Capitol these little incandescent lamps are arranged in artistic groups, and in some of the rooms upon beautiful chandeliers, the finest of those being in the President's and Vice-President's rooms on the Senate side. But the finest effects produced by the lamps comes from those over the Senate and House. Under the roof of the latter there are 1,400 sixteen candle-power lamps, each covered on top side by a reflector. This throws the light down through glass panels set in iron frames and decorated with the coat-of-arms of each State. The lamps over the Senate ceiling number 1,200, the light of which comes through glass panels painted with symbolical designs, representing War, Peace, Union, Progress, Art, Science and Industry. Colors are employed in the decorative scheme of both ceilings, and the effect of the electric light coming through the glass and bringing out the detail of each illustration is charming.

The power plants of the Senate and House are each located under the terrace, the latest addition to the Capitol, and costing, with approaches, $1,200,000. The walls of this are composed of marble, granite and brick, and the roof of brick, built in shallow arches supported by iron beams, the whole being covered with concrete and asphalt top dressing. Bullseye skylights furnish light for the rooms and corridors below, where are many committee rooms and, as mentioned, the power plants.

United States Capitol, Washington, D. C.

The latter make the "bowels" of the Capitol look like the power department of an immense factory, but the thunder and bustle of work are not heard in this government "lightning factory," for every piece of machinery used is of the best of its kind and adjustment of steam wheels, dynamos, etc., is such as to make them almost noiseless.

All these things, and more, will the visitor at the Capitol—which will be the chief point of interest during the centennial celebration—see. And he can stand near where George Washington stood on that memorable September day in 1793, and placed within the cornerstone the engraved silver plate bearing record of this great event in our country's history. This record is as follows:

"This southeast cornerstone of the Capitol of the United States of America, in the city of Washington, was laid on the 18th day of September, in the year 1793, in the thirteenth of American independence, in the first year of the second term of the presidency of George Washington, whose virtues in the civil administration of his country have been as conspicuous and beneficial as his military valor and prudence have been useful in establishing her liberties, in the year of Masonry 5793, by the Grand Lodge of Maryland, several lodges under its jurisdiction, and Lodge No. 22, of Virginia, from Alexandria. Thomas Johnson, David Stewart, Daniel Carroll, commissioners; James Hoban, Stephen Hallette, architects; Joseph Clark, P. W. C. M. P. T.; Collen Williamson, M. Mason."

'Tis Freedom's Temple. Lo, the sky
Bends down to bathe its brow in blue;
To canopy the Goddess high
With Heaven's color for the true.

NICODEMUS.

THE EVIL SIDE OF SENSATIONALISM.

In the press of other important matters in China it will be a pity if time cannot be found to hunt down and punish in some adequate way the manager or managers of the extensive lie factories in that quarter, from which came, for days together, such a grist of hideous tales of murder, rapine and torture, to shock and horrify the world. It is now certain that all, or nearly all, of these stories of persons boiled in oil, women beheaded, and children tortured, were themselves diabolical inventions. It is not too much to say that the persons who concocted and gave currency to these atrocious falsehoods were guilty of a crime hardly less grave than those which they attributed to the Boxers. Cruel and merciless reprisals upon inoffending Chinamen in other lands, quick and sharp strokes of vengeance by the allied troops already in China, and lives darkened and perhaps shattered irretrievably by the awful tidings of loved ones outraged and murdered—all these things, and much besides as bad or worse, might easily and naturally have followed the publication of these circumstantial tales of blood and death, which have since proved to be utterly without foundation. It was only an overruling Providence, and the noble spirit of restraint happily present among civilized people generally, which prevented the worst of these consequences. As it is, it can never be known how much real and lasting harm was done by the world-wide circulation of these hideous lies.—Leslie's Weekly.

PROSPERITY IN GEORGIA.

James W. McMillan, Milledgeville, Ga., writes: "Business is good with us down here in Georgia. I have recently purchased ninety-three acres of clay land adjoining my yard, and have bought a 100-horse-power boiler, and will soon put in place a good Corliss engine, the business having outgrown the power I have been using. I hope to meet with the brethren of the N. B. M. A. at Old Point Comfort in February. Thanks for the continued success of our Clay-Worker."

NOTE ON THE USE OF PRODUCER GAS IN BURNING BRICKS.

By Carl Giessen, Canton, O.

"Reprint from Volume II Transactions American Ceramic Society."

IN SUBMITTING a paper on the use of producer gas for burning brick, I do not presume to attempt any scientifically correct analysis of the method. I have noticed of late that the attention of clayworkers is becoming very generally directed towards the introduction of this method of burning. I have lately had opportunities for a considerable period of witnessing this method of burning on a large scale, and in very successful operation, and take this occasion to state what I have observed as to the working of the plan.

The continuous kiln at Mt. Savage, Md., which was designed and built by Mr. James Clifford, of that place, has had an uninterrupted success for a period of twenty years.

As far as I am aware, the kiln at present is only semi-continuous, as will presently appear. The kiln is rectangular and may be of any length; it consists of one long continuous structure, subdivided by flues and doors into compartments, called chambers, eighteen feet in length. The height, eight to nine feet, and width, fourteen to fifteen feet. The main flues run along the whole length of one side of the kiln at a distance of about three feet from the kiln wall. I understand that the reason the kiln was not made wholly continuous by building it in an eclipse or circle, was the conformation of the ground available. It is right up in the mountains and there was only room to build the kiln in one direction. Each chamber has one cross flue, the latter being three feet by four. Dampers made of fire clay slabs are arranged to drop into a trough of fine sand to secure a perfect seal just outside the kiln wall.

The crown of the kiln is semi-circular in shape, and has seven port holes running crosswise; the distance lengthwise between one row of the holes and another is twenty-seven inches. Situated at one end of the kiln, which may be called the commencement, are the fire boxes which are of the ordinary type.

The method of setting on the bottom is the same as for an up-draft kiln, that is to say, five small arches at equal distance across the kiln three inches wide by fourteen inches high, are run the whole length of the kiln. Above these arches the brick are set close together and as near the crown as possible, with vertical holes or flues from top to bottom, directly beneath the corresponding port holes on the crown previously mentioned.

Three chambers are set in this way; then at the end of the third chamber, an iron partition is placed in position against the brick. It is proper to mention here that this partition is sometimes made of paper, in which case the setting is continued in the following chamber close to the partition, allowing the paper to burn out when the necessary heat reaches it.

When the iron partition is used the settler leaves a space of three feet from the partition, which is filled up with brick rapidly, and the partition removed at the proper time, as afterward explained. In either case the partition must be so constructed as to be absolutely air tight.

The first three chambers being filled, fires are started at end of kiln, the damper at the third flue is opened and the brick undergo the process of water smoking. If the brick have not been thoroughly dry before having been set, the damper at the first flue is opened that the moisture may not penetrate through the other brick. By the time the brick in the third chamber are dry, when the heat will be 250 to 300 degrees Fr., the setters will have advanced two or three chambers, when partition is put up as before described. The first partition, if of iron, is then removed and the vacant space filled with brick, as already said.

By this time, the heat at the beginning of the kiln, will have attained sufficient intensity for the ignition of the gas from the producer. The producer is a hollow oblong structure made of iron and lined on the inside with fire brick. It is fourteen feet in length and four feet in breadth and about the heighth of the kiln.

The bottom, which is about two feet from the ground, is covered with grate bars. A small door is located at each end to enable the burner to stir up the fuel and clean out. On top of the producer are four cylinders projecting a little way into the body of the producer. Inside the cylinders are hollow bell-shaped dampers, the small end being uppermost, the bottom being slightly flanged. A chain is hooked onto the bell, and is attached to a rod working in a fork-like lever, at the other end of the rod is a weight sufficient to hold the damper in position when cylinder is loaded with coal. By raising the weight the damper descends, and, all the dampers working conjointly, the fuel is regularly and evenly distributed over the grate surface.

From the center of the producer a tube twenty-eight inches in diameter and lined with fire brick, runs across the kiln with outlets connecting with the port holes, before described. The producer is portable, and moves on wheels on a track along the side of the kiln on the side opposite to the main flue.

The idea of having the producer portable is that by being able to move it to successive chambers, the gases are still hot when they enter the kiln, and ignite more readily than if conveyed through flues or pipes from a stationary producer. In the latter case, the gases, owing to long travel, would become cold and decarbonize, and require a great deal to ignite them on reaching the kiln.

As has been explained, when the heat in the kiln has become high enough, the gas from the producer is introduced, which immediately bursts into flame. A good red heat must be obtained before gas will ignite. The starting fires in the furnaces are now allowed to die out after a heavy charge of coal has been thrown in and the fire holes sealed up, care being taken to provide for the admission of just sufficient air to produce complete combustion.

Every twenty-four to forty-eight hours, eighteen to twenty-two thousand brick are burnt and the producer is moved three to four holes up, or a distance of from seven to eleven feet at a time. Care must be taken to keep the producer back far enough, owing to the gases traveling in an angular direction from top to bottom, in order to burn the bottom on each advance.

One drawback in connection with this otherwise excellent system is, that the problem of getting sufficient heat to burn high-grade fire brick down to the bottom of the kiln by means of the gas producer alone has not yet been satisfactorily solved. In order to facilitate the burning of the bottom bricks, a small quantity of coal is thrown into the bottom through the port holes. This is not absolutely indispensable, as the necessary heat would reach the bottom if sufficient time were allowed, but by this means the same result is more expeditiously obtained, and the producer can be moved more frequently, thereby burning a larger number of bricks in the same time, and thus materially reducing the cost of operating.

In ordinary clays, however, heat sufficient for all purposes is generated throughout, without the necessity of introducing the coal. The temperature used here is about three thousand degrees Fahrenheit.

After the third chamber has been burnt, and the producer has been moved, the wicket of the first chamber may be partly opened, and the cooling of the brick is thereby begun. Care must be taken in opening and drawing a continuous kiln, that the produced shall always be at least three chambers ahead of the wicket last opened. When the proper conditions are observed, the air passing through the hot bricks, reaches the brick under process of burning in a highly heated condition, thereby assisting the process of combustion. When the air is

admitted too close in rear of the burning chamber it may be cold enough to check the kiln, if not actually stop the ignition of the gas from the producer.

Should it happen that the heat has been reduced from this cause, the remedy is to partly close the damper ahead of the producer, thereby reducing the suction of cold air upon the heated or burning brick.

If I have succeeded in placing before you an approximately correct idea of the method I have been attempting to describe, I think you will perceive its very evident advantages over the ordinary method of burning clay ware.

I briefly refer to some of these:

Economy of space.
Steady maintenance of uniform heat.
Economy in saving of time.
Uniform burns from top to bottom.
Saving of labor.
Reduction in the cost of repairs.
No air checked or blistered brick.

But the greatest and most obvious advantage, and therefore the most interesting feature of the system, is its greater cheapness. It has been shown that from eighteen to twenty-two thousand brick are burned about every twenty to twenty-four hours; the quantity of fuel used in the same time is as nearly as possible three tons or a little under. This gives an average consumption of three hundred pounds for every thousand brick burned at three thousand degrees Fahrenheit.

For ordinary brick that are burned at a less heat, the quantity of coal required per thousand by the same process would be considerably reduced. This is at least twelve hundred to fifteen hundred pounds per thousand less by this method than is required by the ordinary mode of burning. The saving in labor is about twenty-five cents per thousand. No doubt when this kiln comes to be more generally used, improvements on the system will be effected, and amongst others, the introduction of gas from the bottom instead of from the top or both, thereby insuring absence of all dirt and dust.

I understand that in Dunnachie's kiln, at Glenboig, Scotland, the gas is introduced from the bottom with very excellent results, indeed, there is no difficulty in effecting this arrangement.

I believe there is a big future for this kind of a kiln and that the time when it will be in general use, superseding entirely the old method, is close at hand. The great amount of fuel thus saved would leave thousands of dollars to be divided as dividends among the clayworkers.

DISCUSSION.

Professor Herbert A. Wheeler: You burn on an average of three hundred pounds of coal to a thousand brick. Do you attribute any of that economy of fuel to the producer itself?

Mr. Giessen: Yes, sir; undoubtedly.

Professor Wheeler: Why?

Mr. Giessen: You have a steady supply of heat going into the kiln all the time, which I don't think you can get if you don't use producer gas or other gas fuel.

Prof. Wheeler: This is a very valuable paper, and a contribution in a direction in which there is, perhaps, a bright future, as the convenience of producer gas is very great. While every clay burner recognizes that gas is the ideal fuel, when it comes to the cold blooded question of dollars and cents, by which commercial success must be gauged, I am not aware that fuel gas has ever succeeded.

When we look at the gas producer critically, it is nothing more than the ordinary numerous fire boxes concentrated in one big box. The single gas producer is more convenient for feeding than several fire boxes; it needs less frequent attention; there is less staining and flashing from dust and ashes that are carried over by the fire, and a much cheaper grade of labor may be employed, which are attractive features; but when it comes to pounds of coal to a thousand brick, I fail to see where there is any economy. In thus concentrating the fire in one big fire box or gas producer, instead of five to twenty-five little fire boxes distributed around the kiln, there is usually trouble in getting uniformity of heat throughout the kiln, and the producer itself is pretty expensive. I know where gas producers have been attempted again and again for boilers, and in a few instances for kilns, but outside of the industries which have to use very high heats, I have not known them to be a financial success. Its use certainly presents grave complications in distributing the heat equally, and I would like to have specific data as to where the actual saving of fuel comes in. The convenience and cleanliness of gas we all realize, but it is necessary to use regenerators with a gas producer to secure fuel economy, and this is not done in Mr. Giessen's design, nor in any of the kiln applications of the gas producer that the writer is aware of, which is a most vital omission. I do not think it is possible to burn 1,000 fire brick to 3,000 degrees F. on a fuel consumption of only 300 pounds coal with or without a gas producer in a down-draft kiln, though it could be done in a continuous kiln.

Professor Edward Orton, Jr.: Mr. Giessen, how was that temperature measured?

Mr. Giessen: They used cones, and the son of Professor Cook, of New Jersey, measured it the last time by some other process. They burn now by trials.

Vice-President Charles F. Binns: Do you know what number cone came down?

Mr. Giessen: It would be about number twenty.

The Chair: You are taking the cones from the temperature, rather than the temperature from the cones.

Mr. Giessen: Professor Cook's son took the temperature of the kiln, and said it was three thousand degrees.

Mr. H. B. Skeele: This is a very interesting subject, and the inflation that is being experienced in the prices of oil now to those using oil, and the fact that there is often a class of goods with which we cannot use coal, makes the subject of producer gas interesting. As to the expense, I was talking with a man who uses 800 tons of coal a day for making steam, and he put in producers and he finds that he can make steam cheaper by putting the coal through the producer than putting it on the grate bars. And as to the comparison of the expense of operating continuous kilns and others, will say I know where 500 pounds of slack coal is the entire quantity used per thousand, and the paper puts it where we might expect, in the use of 300 pounds. But the great trouble has been in the use of producer gas in kilns already built, is getting it there. It must be used hot right out of the producer, and I do not know of any operation that was successful where it is burned at any great distance from the producer. If any one knows how to use it at any distance, to convey it over the yard, I would like to hear from him.

Prof. Wheeler: I do not like to question Mr. Giessen's figures, as he has obtained them from indirect sources, but I had hoped that he would give us the reason why there is economy of fuel in the concentration of the fires in one box. We recognize the convenience of the design and the advantages of cheaper labor, but 300 pounds coal consumption to the thousand fire brick with the continuous kiln that this gas producer fired is economical, though not remarkable. In a continuous kiln 300 pounds coal consumption for 1,000 fire brick is excellent, but we could do as well as that with about forty small producers or ordinary fire boxes and distribute the heat more successfully. A single fire box is simply a convenience, but without the regenerator system, I do not see where there is a fuel economy over the multiple or common fire box system, and Mr. Giessen's very low fuel consumption is due to the continuous kiln as no regenerator was used.

Mr. Ellis Lovejoy: Mr. Giessen's economy of fuel is due, not to the use of producer gas, but to the application of the continuous kiln principles.

The air to feed the fires enters from the cooling chambers at a temperature nearly equal to that required to burn the ware, and comparatively little fuel is required to bring the temperature of this air to the required limit. Even so, yet 300 pounds of coal seems to me extremely low for a ware requiring such high temperatures; we cannot do it with coal, and I do not see how the application of the coal in the form of producer gas will lessen the quantity required.

We have a continuous kiln of twelve chambers, in each chamber of which a gas producer is constructed. The coal is fed through the top of the kiln into an open box on the floor; the division wall separating the chambers forms one side of this box. The hot air from the cooling chambers passes through holes in this division wall—part of it passing up through the coal, just as in a producer, giving us the primary combustion, while the remainder comes in over the producer box to complete the combustion. Thus we have an automatic producer in every chamber, and, moreover, we have no heat carried away in the ashes, or lost by radiation from the producer or its

connections. In this way we can burn light buff bricks in a continuous kiln, using coal direct, without any discoloration.

We, however, use more than 300 pounds of coal per thousand, and our ware does not require above cone eight.

Prof. Wheeler: What do you find is your consumption—the saving of fuel?

Mr. Lovejoy: That question has been asked me a great many times and I don't know how to answer it. It depends entirely on the kind of brick you are burning as to how much fuel it takes.

Prof. Wheeler: What is the relation between the continuous kiln and up-draft and down-draft kilns on the same ware?

Lovejoy: Twenty-five per cent. of the fuel used in the down-draft kiln will burn the same ware in the continuous kiln.

Prof. Wheeler: Can you tell about how many feet of gas is equal to a ton of coal?

Mr. Lovejoy: In natural gas?

Prof. Wheeler: Yes.

Mr. Lovejoy: I have no measurement on our continuous kilns to determine whether we are burning in them as economically with gas as we did with coal. In our down-draft kilns we have found by measuring the gas used in several burns that 22,000 feet of gas does the work of one ton of coal, and assuming that there is the same economy in the continuous kiln with gas as with coal, we would be using 500 to 600 cubic feet in these kilns to do the work of 22,000 feet in the down-draft kilns.

There is one danger in using producer gas, or any gas, in a continuous kiln, which has not been brought out, and that is the loss of fuel through excess of air. The temperature of the producer gas is comparatively constant, and the quantity introduced can be nicely regulated, but the air to complete the combustion, coming from the cooling chambers, is constantly changing in temperature, and consequently in volume introduced into the fires. There must be a slight excess of air to insure an oxidizing flame, if such is wanted, but unless handled with a care, and knowledge, beyond that of even a careful workman, there is danger of considerable variations in the air, with chances in favor of large excess. Any excess means loss of fuel, and wide variations may mean loss of ware. With coal, we take in large excess of air—up to 300 per cent.—in the first chamber; the products of this combustion, with the excess of air, passes through the fuel in the second chamber, which lowers the excess; the third chamber will still further reduce the excess, and our experience is, that we seldom have any air left to support combustion beyond the third chamber. The great advantage of gas over coal in a continuous kiln is that it can be introduced into any part of the kiln, without damage to the ware, while the coal must be burned apart from the ware, and the heat from it cannot be conducted to all parts of the kiln, to maintain equal temperatures, and insure uniform results.

Prof. Orton: It seems to me that Mr. Giessen has brought out a paper which should be valuable to the society, but the real excellence of his paper has been obscured, perhaps, because he did not distinguish between the nature of all the problems involved.

To consider the fuel record it is necessary to compare the fuel record of a continuous kiln fired with gas, and the fuel record of the same kind of a kiln fired with solid coal. It has been made plain by several speakers that while 300 pounds of coal per 1,000 brick is a most excellent record for a continuous kiln, it is not phenomenal. Seger gives 200 kilograms or 440 pounds to the thousand as an average. This means that the amount falls much below that in some instances, depending on the temperature attained in the kiln, and other points of the sort. So far as the excellence of the record is concerned, we are not in a position to form much of an opinion about that. From the data submitted, simply judging this kiln by other continuous kiln performances, it seems good, but not extraordinary.

Several allusions to the value of producer gas have been made, and it may be worth while to recall to your minds the actual facts on which the economy of producer gas must rest.

In the producer, we perform the first reaction, burning the carbon substantially to C O. Of course there are numerous other side reactions taking place, but the gas produced is essentially C O, and it still contains locked up 5,600 heat units per pound of carbon contained. We may carry, then, this pound of carbon in the form of producer gas to the point where we wish to burn it, and there liberate the remaining 5,600 heat units. If the gas is cooled down to atmospheric temperature, it means the loss of 2,473 units out of 8,080; a heavy proportion to pay for the advantage of producer gas.

If the producer is located a long distance from the kilns, so that the gas reaches them cool, you lose substantially 30 per cent. of the heat contained in the fuel. On the other hand, if the producer is located very close, you may greatly reduce the loss. Of the 2,473 heat units given off in making the gas, a large part may remain in the gases as sensible heat of the gases themselves; and these heat units may be carried by the gas directly into the kiln, where the remaining heat units are given off when the gas meets air.

Therefore, if you are using gas hot from the producer, and throwing it into the zone of combustion with comparatively little cooling off, there is no great loss of efficiency in using coal in this form. In a gas producer process, that point should be carefully studied. The efficiency of the process depends on using the gas from the producer at as small a distance as possible, and the utmost pains should be taken to prevent cooling down of the gas before it reaches the scene of its final combustion.

There is another source of economy in the use of producer gas. This lies in the fact that it is perfectly possible to approximate much more closely to the theoretically perfect combustion. To burn a pound of coal requires, as we know, about eleven pounds of air (speaking in averages), yet we often use twenty-two or thirty-three pounds, or even fifty-five pounds of air per pound of coal in actual operations. An excess of 300 per cent. of the theoretical amount of air required is not uncommon.

With the use of producer gas it is quite safely possible to cut down the excess of air in cases where it is the intention merely to consider the efficiency of heat production. In clay burning, the chemical condition of the atmosphere is often most important, and all questions of fuel economy must be considered as secondary to this. But it is possible in the use of gas to limit the excess of air very much more than with solid fuel, while still maintaining an oxydizing fire and consequently there is less heat carried out as sensible heat of the waste gases, and so economy may come in that way.

I would say that producer gas gives the greatest economy where it is produced very close to the scene of its use and is brought to combustion without cooling off much, and where the quality and kind of ware is such that the prevalence of a neutral and occasionally reducing atmosphere will do no harm. Under these conditions we could get a high degree of economy with the producer.

THE "BRICK DOG" DEAD.

"Pete's" Fondness for Baked Clay Gave Him Notoriety in Greenville.

"Pete," otherwise known as the "brick dog," is dead, says an exchange. He was owned by Henry G. Hermann, of 60 Greenville avenue, Jersey City. "Pete" was as familiar a figure throughout the Greenville district as was his master. He was a little dog, and his pedigree was hazy, but he was a great favorite, especially with children, who were content to take "Pete" as they found him, without regard to his ancestry. They generally found him affable and glad to wag his tail in response to the boyish greetings that met him at every turn.

"Pete" got his second title, the "brick dog," from his fondness for bricks. What the attraction about baked clay may be no one could tell, but whenever "Pete" found a brick anywhere he picked it up and carried it home, carefully depositing it in the yard at the rear of the house. The distance at which the brick was found made no difference to "Pete." A city block or a mile was all one to him. It was only when the boys tried to take a brick from "Pete" that he ever showed his teeth. When he first tried to carry a brick it was hard work, but in course of time his mouth developed to suit the circumstances, and of late years it is said that "Pete" could have swallowed a brick had he been so disposed.

Mr. Hermann first discovered "Pete's" love for bricks about ten years ago. He found several br,icks in the yard and threw them into a vacant lot adjoining. The next morning they were back in the yard again. He threw them out again, and then watched until he saw "Pete" lug one of the bricks into the yard. He hunted for bricks as other dogs might for game, and on one occasion he is said to have carried a brick from Bayonne to his home, a distance of three miles. When the bricks became sufficiently numerous Mr. Hermann utilized them in constructing a brick walk through his yard. He also supplied bricks to his neighbors for the same purpose.

"Pete's" queer taste had nothing to do with his demise. He died from general debility, incident to old age, having rounded out his twentieth year, which, experts of Greenville say, is about five years beyond a dog's allotted age. Mr. Hermann gave "Pete" what one of his boy neighbors called a Christian burial at the rear of his home, and "Pete's" grave is marked by a mound of bricks that he had carried to the house.

OFFICIAL ANNOUNCEMENT.

The Fifteenth Annual Convention of the National Brick Manufacturers' Association to be Held at Old Point Comfort, Va., February 11th to 16th, 1901.

AT OUR LAST annual meeting invitations were received from several cities in the Middle West, each setting forth its advantages and urging that it be selected as our next meeting place. At the time, in lobby talks, a number of our Eastern members suggested the advisability of our selecting some Eastern city, calling attention to the fact that we had not met in the East since the convention at Washington in 1892. Others from the South suggested that if we could meet at some point where the cold would be less intense there would be a larger attendance from the South.

We are pleased to be able to gratify both of these factions by arranging for our next annual meeting at Old Point Comfort, Va., February 11 to 16, 1901. Situated midway on the Atlantic coast, Old Point may be reached in a few hours from any of the Eastern or Northern points. It is equally accessible from Southern territory, and being a delightful winter resort, it will afford those accustomed to mild weather a pleasant and safe harbor, while its many other attractions, not the least of which is Hampton Roads, a broad and beautiful expanse of sea formed by the confluence of Chesapeake bay, the James river and the Atlantic, where the Nation's greatest naval fleets are wont to gather, make it equally attractive to those from the Central and Western sections.

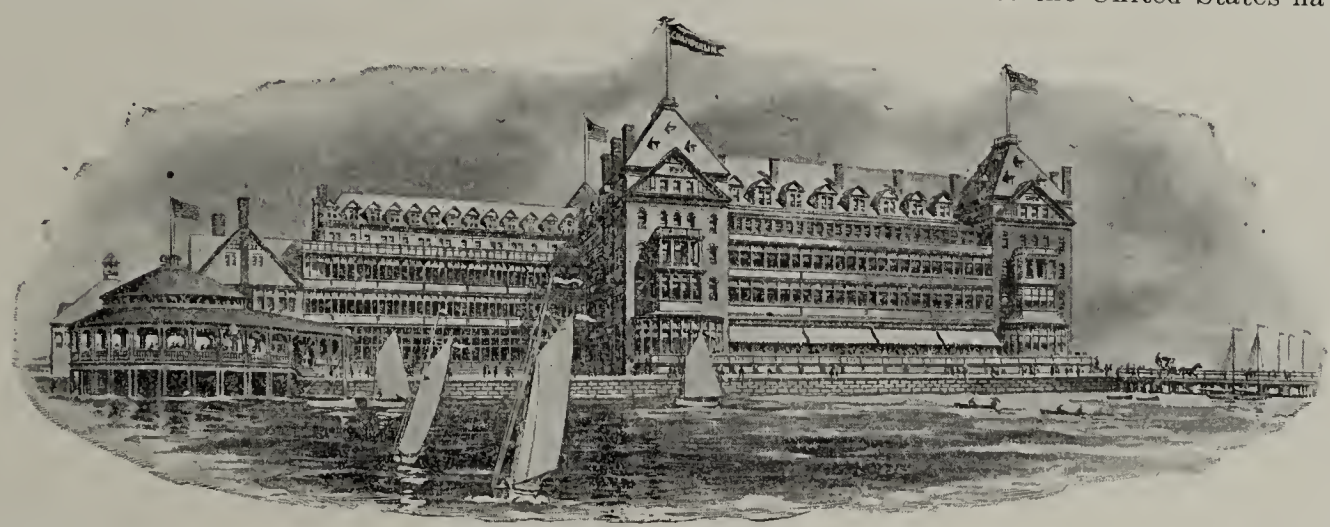
The facilities for convention work are unexcelled. Hotel Chamberlain, which will be headquarters, is noted for its excellent equipment and splendid service, and will afford every convenience necessary for the entertainment and comfort of our entire membership. A special rate will be made to all delegates and their families. Those who may want to stay longer than the week of the convention will be granted the same rate so long as they remain there.

In due time the usual arrangements for reduced railroad rates will be made, and we hope, also, to provide for stop-over at Washington, D. C., so that those who wish to do so may visit the national capital on their way to or from the convention. The splendid steamships plying between Old Point and Washington run the year around, as do also the boats to Baltimore and Atlantic coast points.

Already inquiries are being made relative to time and place for our next convention, which indicate widespread interest. Evidently, the attendance will be fully up to that of recent years, if not greater. The programme will be announced in good time. Clayworkers who are not now members, but who wish to join the association, and attend the meeting at Old Point Comfort, are requested to write to the secretary at Indianapolis for further particulars.

THE EXECUTIVE COMMITTEE.

THEO. A. RANDALL, Secretary. W. D. GATES, President.



Hotel Chamberlain, Old Point Comfort.

NOTES FROM TIDE WATER, VA.

—Pointers for N. B. M. A. Members.—

There are many points of interest for the members of the N. B. M. A. to visit during their stay at Old Point Comfort. The Old Dominion, Mother of States and Statesmen, is full of historical points of interest. The clayworker can sit in the magnificent Hotel Chamberlain and look out over Hampton Roads, where the world-famous battle took place between the Monitor and Merrimac. Immediately on their left is old Fortress Monroe, where Jefferson Davis was held prisoner during the war between the States. In front of the hotel is the old Rip Raps in full view. It is only half a day's ride up the historical old James river on the palatial steamer "Pocahontas" to Jamestown, where still stands the ruins of one Jamestown church where Pocahontas was baptized, in 1613, by Rev. John G. Chapman. This is the only place I know of where they have brick sidewalks through corn fields and woodlands. Where once stood a town with brick walks is now either in corn fields or peanuts, or growing up in pine trees.

Other points of interest are the great shipyards or drydocks of the Newport News Ship-Building & Drydock Company, of which the late C. P. Huntington was president. At this plant the Kentucky and Kearsarge, two of Uncle Sam's best battleships, were built. Also the United States navy yards, at Portsmouth, where the Texas and Raleigh were built. The visitors will also see what is said to be the finest harbor in the world—Norfolk harbor.

I believe the members of the N. B. M. A. will have a fine time. Of course, it will be a little too cool to go in bathing, but those who have a weakness for hunting and fishing can have a feast. Ten miles by canal from Norfolk is Lake Drummond, right in the center of the great Dismal Swamp, one of Nature's wonders. To reach this lake one must go by canal through what looks like the jungles of Africa, and they are full of bears, deer, wild cats and all kinds of small game. This lake can only be approached by three small canals, only one of which is navigable to commerce. Jerrico canal, leading from Suffolk, was surveyed by George Washington. This is also the peanut center of the world. The peanut factories are worth visiting. It is very interesting to go through them and see from one to two hundred colored girls and boys cleaning and grading the peanuts. This has come to be quite an industry. In the little town of Suffolk we have four factories, which employ nearly one thousand darkies.

The Suffolk Clay Company has just closed a contract with the United States navy yard to furnish one million hard brick, to be used in erecting new buildings in the Portsmouth yards.

The summer yards have all shut down for the season, with a large stock of brick on hand. Prices are down very low; brick are being delivered at building at $5.50 to $6.00, with $1.00 freight.

The Nansemond River Brick & Tile Company are putting in a new one hundred horse-power boiler to run their new steam dryer, which they expect to put in this fall. Mr. A. V. Sturgeon, of Suffolk, Va., is general manager. H. L. JACOBS.

By the light of the kiln fires, long gone out, I sit with my heart a-hunger
For the gladsome scenes and the merry rout when the world and my heart were younger;
When life, like the flush of the mouth wood's flame, was a dream full of light and glory,
And the greatest griefs that our hearts could claim, they borrowed from song and story.
By the light of the kiln fire years ago our world was a world of gladness.
And little we cared for the future's woe and little we reck'd of sadness:
Ours was the world of the poet's dream, with hopes like the stars above us,
And the shadows that danced by the circling gleam were but visions of friends to love us.

By the light of the kiln fires, long gone by, our castles in Spain we builded:
Oh! never were castles so broad or high, and never so gaily gilded;
For their blocks were set in cement of song, its song with the kiln fires blending,
And its sweet strains flowed through the whole night long in a strain that is never ending.
By the light of the kiln fires, years long fled,
Came dreams that inspired the rover,
And he followed the path where his fancy led,
Through its vistas of bloom and clover,
'Till the light grew dim and his step grew slow,
And his castles were sunk in sorrow,
And he yearned in vain for the kiln fire's glow
Which he left for the lost to-morrow.

From the light of the kiln fires, years long fled,
Come back through the desert surging,
Bearing broken burdens of hopes long dead
And of sorrows that need no urging.
Oh, life, like the flush of the mouth wood's flame,
Was a dream when the world was younger,
But the greatest grief that our hearts now claim
Is the grief of an old heart's hunger.

—BRIAN J. DUNN.

Nov. 14, 1900.

Twenty years ago he was a bad boy, making trouble for his father's brickmakers in every possible way. He caught bull frogs and dropped them into the molds just as the striker was pushing in the lever to fill the mold. When the unsuspecting Frenchman dumped the mold on the yard and drew the slide a much excited and angry bull frog leaped out from the bosom of the virgin brick into the Frenchman's face. "You go long," cried the Frenchman. "You bad little boy. Sometime you grow big man, but dat bull frog she get square for your bad work." The boy laughed and kept on with his mad pranks.

He was going home from his law office one night last week while the line gale was shrieking its maddest. As he passed by a three-story frame building the wind blew a loose brick from the chimney and it rolled down, fell upon his tall hat and stove it in, afterwards shattering itself on the pavement. He stopped to pick up his hat and brought with it a section of the brick, and in the section was the plain imprint of a bull frog. Did the frog get its revenge?

* * *

Prejudice is the greatest enemy that progress has to encounter. Were it not for prejudice the lion might yet lie down with the lamb and the mother-in-law rule peacefully in her daughter's household. Prejudice blinds the eye to the truth contained in your opponent's argument; prejudice has driven reformed men back to crime; has deprived deserving worth of the merits due it; has deformed liberal institutions and distorted measures intended to be benign. Custom and prejudice, hand in hand, have opposed Christianity and civilization at every step, and custom, prejudice and superstition have frequently thrust aside the work of peace and charity and plunged brothers into murderous killing of brothers.

And, as in all things, the brick manufacturing industry has felt the curse of prejudice in the past. It dies hard, but it is dying. In my section of the country twenty years ago the custom was to make brick by the old mud process. There was a prejudice against machinery. Masons would not lay machine-made brick if soft mud brick could be had. What a change has come about since the introduction of machinery there. Now the masons demand stiff mud brick if they are to be had. Custom has changed and prejudice has changed its base.

* * *

Fifteen years ago, when a day's striking got spattered with rain the careful brickmaker had them all carefully swept to smooth them up and remove the sand and water tracks. Now the masons ask the manufacturers to give them the brick just as the rain left them. They say they make better walls when laid in the rough.

Fifteen years ago the careful setter swept his kinches as he set them. The masons now ask him to let the bricks alone and give them to him with all the sand and roughness on them. Times change; old prejudices die; new prejudices, of course, spring up, but change is the order of nature, and if we are to have prejudice, let us rejoice that it must, like everything else, bow to nature's law and change.

* * *

Years ago there was a boss brickmaker so prejudiced that he left his job rather than sit at table with an Irishman. The Irishman owned the brickyard ten years from that time and he took care of the old man in his feeble age. The Irishman couldn't bear the presence of a Frenchman. The Frenchman started an opposition plant and his son married the Irishman's daughter in time to save the Irishman from a financial collapse. Get thee hence, prejudice.

* * *

"Do I believe in the bad luck of the No. 13? Indeed, I do. I had thirteen dollars when I started in the brick business, away over East. I hired thirteen men, and in thirteen months I had $1,300 in bank. I had burned thirteen kilns of thirteen arches each, and all without ever having planned such a play on the number thirteen. In thirteen months more I had lost all, including the thirteen dollars I had originally. I might add that my thirteenth kiln fell down at both heads and got melted so that we had to move it away with the aid of dynamite and crowbars, and it was my thirteenth creditor who employed the sheriff to indulge in a public auction on the ruins."

* * *

I wouldn't have thought of the fateful number if it wasn't for the story told me by the thirteenth man whom I had employed to haul wood to my thirteenth kiln. He had been quite a man in his time, and once, in New York, had held a good place in some big mercantile house. But he was subject to drink and a superstitious fear of the number thirteen. He told me that the last job he had held in New York was at No. 13 Wall street, and that it was his thirteenth position in the city. He had begun at $13 a week and had increased to $1,300 a year, when the blow fell.

It was thirteen doors either way he turned from the entrance to his office to a beer saloon. There were thirteen letters in the name of the proprietor of each saloon and he was thirteen weeks employed in his new place before he took a drink. One night he had delegated to him the charge of preparing an important document, which required keen perception, hard work and unremitting watchfulness. The thirst for drink came on him uncontrollably. It forced him to go to one of the saloons for a drink. He repeated his trips during the night until it came to the thirteenth number. Then he hesitated, but finally he went. He took his thirteenth ball and immediately his head swam. As he reeled back to the office he met one of the managers, whose name contained thirteen letters also, and he got fired on the spot. He then discovered that it was the thirteenth of the month. I might add that he left the kiln before morning, taking with him thirteen cents from my coat pocket.

A CAUSE OF VARIATION IN THE FIRING OF KILNS AND A REMEDY FOR THE SAME.

By Karl Langenbeck, Zanesville, O.

"Reprint from Volume II Transactions American Ceramic Society."

IT IS A COMMON experience at all clayworking establishments that they have a "best kiln," which the burner will point out, when asked, without a moment's hesitation.

It is usually and very naturally the most dilapidated one, for it is the one that is worked uninterruptedly when lack of business shuts down the greater part of the plant, and it is patched and replaced piece-meal, when others in a similar condition would be torn down, for entire rebuilding.

I have never succeeded in eliciting an intelligent reason or theory from either burner or superintendent of works, for the virtues of the "best kiln" or the delinquencies of its companions, many or most of which are built on exactly the same pattern and are in practically the same position with relation to the prevailing wind, etc.

The Mosaic Tile Factory started with two kilns on the downdraft principle with a center stack; the kilns are twenty feet in diameter and eight and one-half to the spring of the crown. The kilns are under cover of a substantial building, from the roof of which only the stacks protrude.

The floor of the kiln shed is paved with brick, but in order to put the kiln doors on a level with the floor of the placing-room, so that the placer need not ascend to the kiln by steps, but can walk in on a level plank, this kiln-shed floor is eighteen inches below the general factory level and the ground outside.

The winter and spring of 1895 were extremely wet. All the foundation trenches of the building had been full of water during the building, and when in the first firing of the kilns the time of burning, which I had calculated to require in the neighborhood of 120 hours, took much longer, it was not much cause for wonder. Still, it was disquieting and took some measure of faith in causality, to push one burning for 288 hours before the required heat could be reached. Gradually, however, the length of fire sank to the expected level.

From the very beginning, No. 2 established its character as the "best kiln," while No. 1 was continually irregular, took more coal and longer to fire.

The factory is situated in a broad valley, but nearer to the hills on the west and south. Through a gap in the hills there is almost always a movement of air from this quarter, bearing right down on the factory, kiln No. 2 being more directly in the track of this prevailing wind. As this feature is so very marked, there being a breeze in Brighton when there is merely a breath of air elsewhere, and a gale on the slightest provocation, it was but natural to assign the difference in the behavior of the kilns to some subtle influence of this cause.

I was away from the factory on business trips most of the time, and had little opportunity for observing and studying the conditions. Still I felt this explanation very unsatisfactory, as the kilns were placed too nearly alike and the stacks of both were controlled by dampers. On one occasion of my being at home during several firings, I had the stack of the delinquent No. 1 raised two feet, with apparently good effect, so that a farther increase in height of two more feet was made. As a result, kiln No. 1 could usually be fired off in about the same time as No. 2. Still it was noticed that it consumed ordinarily more coal, as it was frequently much more unreliable in its regulation.

The most inexplicable phenomenon that not infrequently presented itself during the firing of kiln No. 1, and at times, though rarely in the case of the "best kiln," No. 2, was, that with a good heat in the center, the spy-holes over the mouths would suddenly become dark, although the draft was good and the coal was consumed readily and freely in the mouths.

It was about a year after the raising of the stack of kiln No. 1 four feet over that of kiln No. 2, which had brought a noticeable improvement, that I again had the opportunity of being at the factory a sufficient length of time to observe a number of successive firings.

I then became convinced that the position of the kilns with reference to their position to the track of the wind had little or nothing to do with their difference in behavior.

I may say that the flues of the two kilns had been overhauled a number of times and were proven to be identical in form and contained no obstructions. The trouble lay with ground moisture.

Kiln No. 1 is situated at the end of the kiln shed with a then unpaved yard on one side. This yard was often flooded in wet weather from the leaky or overflowing spouts of the converging roofs. On the other side is the railroad switch and road, both yard and switch lying higher than the floor of the kiln shed, as I have already explained.

Kiln No. 2 is farther along in the kiln shed and completely protected by the buildings from any seepage from the outside.

Still, if the water from immediate rain-falls were alone at fault, it would hardly have taken even the ordinary fireman three years to note a connection between the wet weather and the unsatisfactory behavior of kiln No. 1.

The truth is that the whole ground is water-logged. It was very difficult for me to grasp this fact, in spite of a number of observations that continually pointed to it: namely, that where we have a wooden, instead of brick or cement floors, the joists are continually rotting out; then the iron drain pipes from the steam heaters gave much trouble by rusting through, so that they had often to be replaced. These facts, as will be readily understood, were a long time in disclosing themselves. The fact that was ever present in my mind was that the soil on which the factory is located is sandy, with numerous out-crops of gravel, and that immediately below the sandy loam on which the factory is built, at a depth of six feet is a deep deposit of coarse gravel. Furthermore, immediately to the west of the factory, at a distance of some two hundred and fifty yards, and immediately at the base of the western hills, before mentioned, is a deep ravine, the stream at the base of which has a good fall and affords excellent drainage.

The inference originally drawn from this topography, was that the sandy soil with its gravel base must allow a rapid drainage for all water falling on the surface to the creek.

You can well understand that in carrying out the plan of a new factory many expenses occur which it is impossible to foresee, and one is compelled to give up many ideas looking to a refinement of the engineering, which must be cut out to economize the means for many small and urgent necessities.

I had intended to place a saucer-shaped cement bed under the foundation of the kilns and cover it with a heavy coating of asphalt, so as to prevent any contact of the foundations and brick work of the kilns with the actual ground.

Convinced, however, by the topography of the location, that the ground was most perfectly drained, I cut out this expenditure to apply the two or three hundred dollars thus saved elsewhere. It proved a fatal mistake.

When once convinced of the root of the evil, I dug down into the soil under the kiln shed to find the cause of its lack of drainage.

The six-foot bed of sand was there, but quite moist, although the weather had been very dry; under it was the coarse gravel and the trend toward the bed of the creek was quite marked. However, this digging disclosed an important, though hitherto unsuspected deposit; a thin vein of tough clay which separated the sand from the gravel, which was as im-

penetrable to water as a layer of India-rubber. Here lay the key to the mystery.

The entire rain-fall on the basin-like valley finds lodgement in the sandy loam, and is prevented from seepage into the gravel, which would drain it into the creek but for this impervious clay septum.

The condition in the case of kiln No. 1 was aggravated by the surface water, which got to it from the unpaved yard and the poorly drained track and road. This discovery accounted for the extraordinarily long firing of the kilns during the wet season, when the factory was first started; also for the longer firings occasionally necessary in after times, which could be directly associated with periods of wet weather.

It also accounted for the advantage found in giving the more exposed kiln, No. 1, a higher stack, for the stronger draft and more rapid consumption of fuel neutralized by evaporation the moisture ascending in the kiln walls.

It also explained the darkening of the outer zone of the kiln, for the strongest ascent of moisture by capillarity was in the porous brick masonry of the hob and the walls. It leaves but this natural doubt: "Could so much moisture ascend so rapidly into a burning kiln by capillarity?"

It is difficult to grasp, but there are the facts. Kiln No. 1 averaged during four years 6 2-3 per cent., or two tons of coal each fire more than kiln No. 2, which required about thirty tons for firing. This is hardly a measure of the difficulty, however, for the increased expense of firing this kiln was the least consideration, although an important one from a business point of view.

The exceptional times, when the excessive coal consumption was very much greater, its erratic behavior and difficulty of regulation, the losses in cracked, flashed and blistered ware, and the continual anxiety and worry as to the outcome were the most vital trials.

I have given you a more detailed description of the slow discovery of the real trouble than the real facts would seem to warrant, but the reasons pointing to a different cause were so striking that without it you could hardly understand why the true reason was so slow in disclosing itself.

The trouble once located, the problem became, how to remedy it. The simplest and most thorough remedy would have been to tear down the kilns, put down a cement and asphalt saucer-shaped base and erect new ones. But one hardly feels justified in throwing away three thousand dollars so summarily.

I came to the conclusion that there never was an actual flow of water in the water-bearing loamy sand; that it was merely capillary movement, and that if this could be broken in an isolating ring around the kilns, the protection to the latter would be accomplished.

heated steam is never absent from any kiln while under fire. The air used for combustion contains it. The fuel and the

I therefore had a trench dug entirely around the kilns, seven feet deep, through the sandy deposit and the impervious clay into the gravel. This trench was filled with broken tile, covered over on top with cinders and the paving brick replaced. If the water in the sandy stratum should actually collect in drops, it would find an outlet at the bottom of the trench into the gravel.

The result was magical. Unfortunately it is not possible to give you comparative data on fuel consumption, for shortly after the above was done natural gas was put into one of the kilns. But the distinction of the "best kiln" has disappeared, and both have lost the worst of their one time vagaries. I hope and believe that so extreme a case will never come under your notice, and that you may never have to battle on the ragged edge of ruin as long as I had to from this very simple cause, or that your abilities will ever be so gravely questioned by yourself and others, as was most naturally the consequence. But I would most earnestly counsel you not to under-value the capillary movement of moisture in the gound on which your kilns are built.

Secure your kilns at any cost from contact of their porous bricks with the earth, cover them with good buildings and see that the surrounding ground is well drained; discharge your fire gases from the kilns by means of stacks that can be built higher or lower as the exigencies require, and supply them with a damper for control. In this way you secure yourself against those two fickle elements, wind and water, and with these under control, mechanical considerations of kiln structure, the physical and chemical action of the fire gases and temperature and focus of the fire are more easily dealt with.

DISCUSSION.

Mr. Frank W. Walker: I do not feel like starting the ball rolling, but I can sympathize with friend Langenbeck, for I have experienced the same trouble for ten or twelve years, and expect to continue with it, as I do not know how to remedy it. Our works lie very low, along a run, and at times the water is higher in the run than the kiln shed floor. Underneath the works is a vein of tough, red clay, five or six feet thick. We dug a ditch around the foundation of the kiln shed to the vein of clay, and filled it in with clay, pugging it in thoroughly, and succeeded in shutting out considerable of the water, but we are still troubled with it very much in wet weather. Aside from the trouble this causes us in handling the kilns, we find it takes more fuel to fire them. We intend to put in a deep cistern and try draining the water into it, and then pumping it out.

The Chair: You recognize, then, that moisture is the cause of your troubles?

Mr. Walker: I do not think there is any doubt about it. It not only takes more coal, but causes other trouble.

Mr. Edward C. Stover: We had some trouble of this kind and finally put drains around the kilns and I am quite sure we have gotten rid of the effect of the steam on the ware. I would like to know whether any one else has had trouble with the effect of the steam on the finished ware, beside the burning up of so much coal?

Mr. Stanley G. Burt: We do not have any trouble in that line at all. We went to the expense which Mr. Langenbeck says he dodged, and put down a carefully cemented foundation for our kilns. Also, our works are located right on the edge of a precipice, where natural drainage is available, hence moisture in the kilns is not an active question with us.

Prof. Edward Orton, Jr.: I can add no new ideas on this subject, but I can substantiate the points brought out in Mr. Langenbeck's paper. It was my fortune once to put a paving-brick plant into operation which had been idle for some months. No provision had been made in the construction of this plant for draining the foundations of the kilns. The whole plant lay on a sloping hill-side. The kilns were built on the lower portion of the slope, so that the natural drainage of the hill-side above tended to concentrate on the almost level kiln yard before passing on down to the river valley beneath. On inspecting the work that had already been accomplished in the plant, viewing the ample piles of culls, and observing the general character of the work done by the kilns, I came to the conclusion that they were suffering from wet bottoms.

Only after a spirited argument could I obtain the consent of my company to surround the entire battery of kilns with well-constructed ditches or drains. I built branches of this system between each pair of kilns, and even connected the center flues of the kilns themselves to this ditch system. We used tile in the bottom of the ditch, putting brickbats and loose refuse on top of that, making a porous zone which could not choke up rapidly, and which would intercept the water from the hill above. On tapping into the flue of one kiln, the men struck a strong flow of water which had accumulated in the bottom of the kiln. It must have been a foot deep. Yet they wondered why they had never been able to get good burns!

One kiln was new and was to be fired for the first time under my management. I again incurred the criticism of the company by insisting on firing the empty kiln up to a dull red heat, preliminary to putting brick in it for the first time. We saved money on the first kiln of brick we burned by using that amount of fuel to dry out the masonry and foundations to begin with. It is beyond question, to my mind, that it is cheaper to evaporate the water out of the walls and foundations of the kilns with extra fuel used for the purpose, rather than endanger the quality of a whole kiln of wares by trying to accomplish the operation of drying the kiln and burning the ware, both at the same time.

Plans and specifications have sometimes been furnished by the Department of Ceramics for the construction of kilns, and we have in every case tried to have our clients put down a heavy block of cement concrete as a preliminary to putting the kiln on it. I think it pays.

(To be continued.)

GENERATOR GAS AS A SOURCE OF POWER ON BRICK-YARDS.

DURING THE LAST few years the use of gas and oil engines has been increasing at an astonishing rate, and a good deal of attention has been paid to produce gas for power purposes. It is only necessary to call attention to the work in connection with blast furnace gases done by expert engineers, which proves conclusively the practical value of generator gases for power. Plants are now being erected in all sorts of industrial establishments for the production and use of such gases.

A power plant of this kind consists, first, of the generator, a cylinder of sheet iron, lined with fire brick, in which the fuel is kept in a thick layer, and a small steam boiler furnishing super-heated steam. The fuel is anthracite or coke, or a mixture of both. Steam is blown in at the bottom and forced through the body of white hot coke. At the same time, preheated air is also blown in, and the mixture of air and steam, acted upon by the coke, results in a gas consisting of carbon monoxide, hydrogen, nitrogen and smaller quantities of other gases, having a calorific value of from 1,100 to 1,400 calories. A generator 6 feet high and 3 feet in diameter (inside dimension) produces sufficient gas for a hundred horse-power engine. After leaving the producer the gas is passed through a scrubber, which never needs any attention, where it is freed from impurities and dust, and made ready for the engine. The generator requires but little care, and the grate is cleaned but once a day, before starting up in the morning, an operation which takes about 20 to 25 minutes. Power can be had as soon as gas is produced, which takes no longer than it would to fire up a steam boiler.

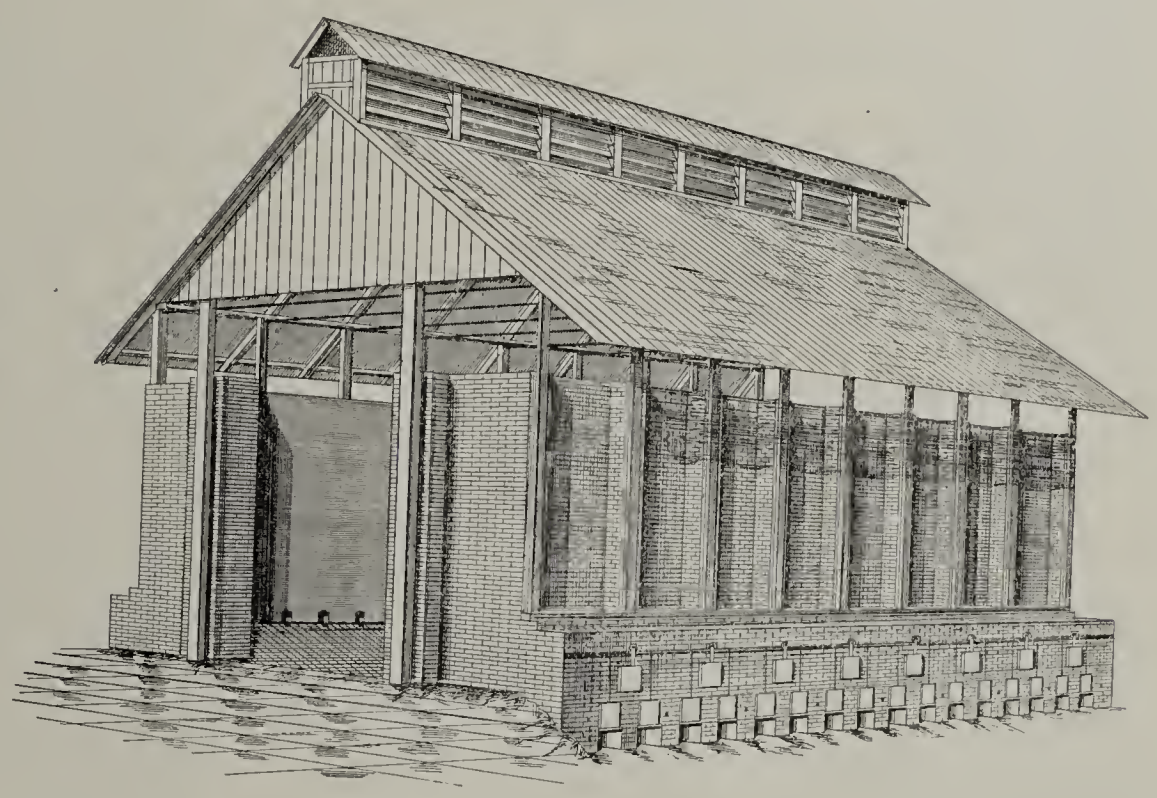
The engine is of the ordinary type of gas engine, in which the gas mixture is exploded by the electric spark, and which is now being built in sizes to over 500-horse-power. The consumption of fuel is about 160 pounds of coke or anthracite for 100-horse-power per hour, which is half that of a good steam engine.

For cooling the cylinder of the engine and steam purposes about one-fifth of the amount of water required for the same size of steam engine is used. As a rule, the first cost of a gas power plant is somewhat less than that of the same size steam plant, no smokestack and fewer fittings being required. In regard to safety of operation, it may be said that this is almost absolute, and hence a corresponding reduction in insurance rates may be obtained. The cost of lubrication is, of course, the same in both kinds of motors. Wherever kilns or furnaces are to be fired the generator gas affords a most excellent fuel, but, of course, would be too expensive to be used for burning common brick in the ordinary clamp kiln. In view of the strides the use of gas is making, it would, perhaps, be well for brick manufacturers and other clayworkers to look into this matter and make a careful comparison, so as to determine the actual value in dollars and cents of making such a change.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

GRATH'S IMPROVED UP-DRAFT KILN.

THE ACCOMPANYING cut is an exact reproduction of the Grath up-draft kiln, with Grath gas and coking furnaces attached. This kiln is especially recommended for burning large quantities of common and press brick. By the use of this kiln the brick are much improved over those burnt in an ordinary up-draft clamp kiln. In the first place, as is well known, the most important thing in burning brick, is the proper combustion of the fuel. By the use of the Grath gas and coking furnaces the fuel, which is common slack coal or screenings, is placed on the gas and coking table, which is always kept red hot. As soon as the heat comes in contact with the red hot coking table the gases in same are generated and immediately consumed, the result being a long hot gas flame. As soon as all the gases have been distilled from the fuel the residue is a mass of red hot coke, which is divided by running a flat bar through the center of same, one-half being shoved into each combustion chamber, where it is consumed, and immediately fresh slack is thrown on the red hot table, the result being that the furnaces produce a combined heat from the burning gases from the coking table, and from the incandescent



coke fire in the combustion chambers. The construction of this furnace differs from all other furnaces, and is the only coking furnace where part of the heat produced in the furnace is drawn or radiated under the coking table to heat the coking table from below. The heat which is drawn under the coking table is led to the center part of the kiln, which burns the brick in the center part of the kiln. The brick in the heads of the kiln are burnt by the heat drawn directly from the furnace through two openings in the rear of same. This construction also excludes all of the cold air from the kiln, and prevents the brick in the arches from checking and breaking, as is the case in ordinary up-draft kilns. On account of the perfect combustion in the furnace the brick in the arches can be used for facing, and are not distorted, like those burnt in the ordinary up draft kilns. Ninety per cent. of the brick in this kiln are hard and red, which is certainly a fine record. Another feature of this kiln is that the smoke nuisance is overcome, all of the dense black smoke being consumed. All brickmakers interested in bettering their products will do well in addressing the Illinois Supply and Construction Company, St. Louis, Mo., who own and control the above kiln. See their advertisement on page 344.

WRITTEN FOR THE CLAY-WORKER.

TREATMENT OF TENACIOUS CLAYS.

UNDER THIS HEADING we will endeavor to answer the questions of a Virginia subscriber, and make such suggestions as we think may assist him and others in working clays of a tenacious character.

First. "If a sufficient quantity of very hot water is used to temper the clay thoroughly, will it have the effect to make the brick stick to the mold?"

No.

Second. "Will they be more likely to crack while drying in the racks if tempered with hot water?"

On the contrary, hot water, used in tempering, is an old and well-known remedy for the cracking of brick in drying.

Third. "Will they be more liable to check or to be tender and shelly after being burned?"

No. It is almost invariably the case that a clay that will dry safely in the form of green bricks may also be burned safely.

Fourth. "Would the same clay tempered with cold water act differently?"

Only in this respect, the brick would be more liable to crack in drying.

Fifth. "Is it practicable to temper a heavy, greasy clay with hot water?"

Just as practicable as with cold water.

We see no great advantage in the use of hot water excepting the safer drying of the brick.

We judge by the questions asked that Subscriber contemplates making brick by the soft clay process; that he hopes to be able to take his clay directly from the bank, temper it in a soft clay brick machine and that the use of hot water in the machine will decompose the clay so that it will be easily ground and molded. This is extremely improbable.

—Experiments In Tempering Clay.—

We would say to Subscriber, study the character of your clay, make some practical tests in regard to tempering and the effect of the previous drying of the clay. For instance, take three lumps of clay, two of them directly from the bank, in a tough, tenacious condition, and one that has been previously dried. Put the dry lump and one of the others in cold water, and the remaining one in hot water. Note the time required for them to become soft and easily molded by the hands. These trials will indicate what methods and means you should adopt. If you wish to make brick by the soft clay process we apprehend that you will have to dry and water the clay before working. This relates to the manner of digging the clay and removing it to the machine. There are two good methods of exervating the clay, either one of which may be applicable to your situation. We will consider them:

First. The falling of the clay. In the March number of The Clay-Worker, 1897, is an interesting article by W. H. Bushell, in which he writes of this method, as follows:

"After the clay bank is opened up we should manage to cleave off the clay from top to bottom of the bank; to do so we must undermine the part we wish to throw down, and cut in a straight line up and down the bank, about 18 inches deep, on each end of the part we have undermined. Now we go on top of the bank with a heavy iron bar, with a sharp point on one end, and make several holes down about 18 inches deep in a line right over the place we have undermined, and we throw our clay in this way, and we have clay enough thrown to make several thousand brick, mixed from top to bottom of the bank in nice shape to load on cars or cart." We have practiced a slightly different method, which appears to have considerable advantage. We would undermine about 15 inches in depth, cut vertical channels 24 inches in depth, and dig a trench about a spade's depth, nearly connecting the vertical channels, pour a few pails of water in the trench, and in a few moments the mass of clay would fall. The expansive force of the clay as it absorbs the water is a far more effective force, for this purpose, than crowbars and wedges. It is applied all along the trench at the same moment, and makes a neat separation. You can fall as long a block as you choose if you will keep the bottom of the water trench level. (Try it, Brother Bushell, and report to The Clay-Worker.) Let the clay lie where it falls, and dry and slacken in the sun, then wet it thoroughly, and it will slacken and dissolve about like lime, after which it is removed to the soak pit, in which it should be laid in alternate layers of sand and soaked. An ordinary soft mud machine will then work it and make a brick as strong and durable as those found in the ruins of the Coliseum at Rome.

—Effect of Weathering Clay.—

Second. The ploughing of the clay. In the article before referred to the writer tells how he would "plow the clay from top to bottom, but only plow enough at one time to last a quarter of a day; in that way you keep the clay from drying out and getting lumpy." But he is giving directions how to dig the clay for his stiff clay machine. He further says: "Most of our Eastern brickmakers advise hauling our clays in the fall to freeze through the winter. It may work in some of our clays to advantage, but my experience has been that it gets too tough and sticky, and we can scarcely make brick out of it." This is no doubt true in reference to the system adopted; but we are disposed to believe that if a liberal percentage of sand were mixed with the clay that a better brick can be made by the stiff mud process from clay that has been wintered. These objections do not, however, hold good in the soft clay process.

We would plow the clay and expose it to the air, so that it would dry out. The more it was acted upon by snow and rain and frost the better. We would grade the bank to a gentle slope, plow the clay along the slope in the fall and scrape it down the slope into a broad, flat pile, containing enough clay for a season's work. We would plow this pile in the spring, as it became dry, and use the wheel scraper, if possible, to carry the clay to the soak pits, where it would be mixed with sand, as before stated. Very much has been said about adapting a machine to the clay that should not have been said. Certainly the first consideration should be how shall I prepare my clay to make a good brick. If my machine will not work it, I will get one that will.

Let your first work in excavating the clay be in the way of making a long fall to the bank. Make plenty of room at the foot for falling a large quantity of clay, or for plowing and scraping, wintering, etc., as may be found most desirable.

So far we have considered the treatment of tenacious clays solely for the purpose of making soft mud brick. We judge that Subscriber intends to use this process simply because in the first question he uses the word "mold." The mold belongs to the soft mud machine, and the die to the stiff mud machine. Nearly all that we have said is applicable to the stiff mud process also. It has been found by some brickmakers that the drying of their clay saves considerable loss in the drying of the brick, and that the use of a sharp sand in the clay tends to prevent laminations and cracking in drying. The drying of the clay, the use of sand and the soak pit, and using the clay as soft as the brick can be handled without injury by careful hands, have been found to be excellent remedies for these faults even in the stiff clay process.

—Mixing Sand With Clay.—

It is generally held that an auger machine requires a tenacious clay, but we believe that a very large majority of its failures may be justly attributed to the working of such clays without admixture of sand. Mr. Crary, of honored memory, maintained that an auger machine was limited to the working of tenacious clays, but a soft mud machine could work any clay. But surely the stiff clay machine is no more limited to the working of tenacious clays than the soft mud machine is

limited to the working of sandy clays, and the stiff mud machine will work a greater variety of clays without admixture of sand. Many refrain from using sand in the clay on account of the wear of the knives and dies. Whenever it saves loss in drying and burning and improves the quality of the brick sand should be used with the clay. There are many banks of tenacious clay that may be used directly from the bank, and the brick dry and burn safely. For such banks the auger machine is the most suitable.

The clay must be kept moist in the bank. We refer Subscriber to an article by R. Brick in the August number (1890) of The Clay-Worker, and also to one in the same number, entitled, "Brickyard Sketches," in which the writer gives an account of a visit to the Alsip Brick Co.'s yard, in Chicago, from which we extract the following:

"The company are fortunate in the possession of a large tract of good clay, which is of a very tough, tenacious character, that enables them to handle it in a peculiar manner. The bank is plowed from top to bottom. A furrow of clay about 10 inches wide and 6 inches to 8 inches deep is turned, which is cut into chunks 2 feet or more in length with a shovel or spade. These chunks are picked up and piled or thrown into carts, much as one would a load of wood. * * * The clay bank is sprinkled every night with a hose, so that it is kept sufficiently moist."

The clay passes through a "disintegrator," which we suppose is of the pug mill variety, into a pair of "roll crushers, where the large stones are extracted," and then into a Chambers machine. The soft mud machine could not be substituted for the Chambers in this train of machinery. The two systems are distinct, and we cannot at this time consider their comparative merits or advantages in working tenacious clays. We hope Subscriber will pardon us for giving unasked, and it may be, unnecessary information. It may be profitable to others. We will close with Davy Crockett's saw, "Be sure you're right, then go ahead," and if unforeseen difficulties present themselves, appeal to The Clay-Worker, and you will find it a "help in time of trouble."

GEO. S. TIFFANY.

UP-TO-DATE.

THE ADVERTISEMENT of the Simpson brick press is again in The Clay-Worker. See page 343. The Simpson Manufacturing Company is up with the times. It is expanding and has grown from its old place in Chicago to a new and much larger plant at Winthrop Harbor, Ill., a manufacturing town forty-four miles north of Chicago, on the Northwestern Railroad. For some weeks past Mr. P. L. Simpson, the secretary and treasurer of the firm, has been devoting most of his time to the moving of old machinery and the placing of new equipment, including large lathes, boilers, engines, etc., in the factory. All being in readiness on Saturday, October 6, they dedicated the new plant and had a general jollification. There were many guests from Chicago and other points, all of whom were shown through the buildings.

The new factory consists of two brick buildings, the first, a workshop, two stories high, 150 feet long by 50 feet wide, is the main building; separate from this, at a distance of a few feet, is the power house, and at the end of that is the brick chimney stack. The power house is divided into two parts by a brick party wall; on one side are the boilers of 150-horse power, but with room to very considerably increase their number; on the other side are the engines. The reason for the considerable steam power with which the company starts, and prospective large increase, is that, in addition to making brick presses and "impact hammer pulverizers," the Simpson Company will provide electric lighting and power for the new city of Winthrop Harbor, and some day, probably before long, 150-horse power will not be nearly enough.

The floor of the main building is of concrete, six inches thick, with heavy joists let in, and upon this is laid a floor or covering of two-inch pine. An ordinary steam railroad track runs through the middle of the shop for half or more of its length. An immense sliding, or lifting door, weighing 1,400 pounds, balanced by counterweights, is at the end where the track enters and will admit any railroad car. The switch from the Northwestern Railway is complete and in operation. At the time of our visit eight railroad cars were standing outside the building waiting to be taken away. These had brought materials and the machine tools, such as big lathes, planers, etc.

The second floor of the building is not a full floor, but a gallery running the whole length of the building on each side 12 feet wide, and at one end where it is 32 feet wide; at this end will be the office of the works, so that even when he is in his office nearly the entire shop will be under the particular eye of the general manager. The gallery will contain the woodworking machinery for pattern making, etc., also the stores for the valuable patterns of all the many types of machines that have been made, as well as those to come, but a very important function of the gallery, for which it has been designed, is that it supports a traveling crane, which extends across the open space from gallery to gallery, and runs for about two-thirds the length of the building. The motive power for the crane is not yet installed; it is to be electric. The crane is

built to carry a weight of twenty tons, with a big margin of safety. The roof of the main building is known as a "quarter pitch," and is covered with a new fireproof roofing material, "asbestos composition." The city office of the company is in Chicago, at 95 Dearborn street.

MAKING BRICKS FROM GLASS WORKS REFUSE IN ENGLAND.

Dr. Ormandy, of St. Helen's, formerly master of science at the Gamble Technical Institute, that city, has recently discovered a process by which good furnace bricks can be made from glass works refuse. St. Helen's, which is a few miles from Liverpool and within this consular district, is not only the center of the English chemical trade, but contains a number of large glass works. The millions of tons of refuse which have accumulated around the glass works heretofore have been treated as of no commercial value. The refuse consists mainly of spent sand, minute particles of glass, and about 3 per cent. of iron from the various processes, and it has hitherto been considered that the presence of the iron prevented the use of the material for the manufacture of bricks.

Patents have been taken out to protect the process, and a large firm has engaged Dr. Ormandy's services. After making various experiments, the firm is now putting up an extensive plant for the manufacture of the bricks. It is claimed that the bricks will stand a great amount of heat. They are about the color of silica bricks and can be glazed. Considerable secrecy is observed as to the process.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Brick and Tile Business in Iowa.

EDITOR CLAY-WORKER:

Some time since I promised I would write you in regard to the clayworking industries of this part of Iowa. The clay in this part of Iowa is not the best kind for working up into brick, etc. It is better for farming, raising corn, wheat, oats, barley, etc.; in fact, we consider this the garden spot of the world from an agricultural point of view.

We do make a few brick here of a fair quality, but very few tile. Have not had any use for tile for several years on account of the dry weather—a man would starve to death selling tile in western Iowa. Most of the yards through this part of the State are hand yards, making the old way—blind horse and pug mill—and burning in the old style up-draft kiln, and the burning is on a par with the rest of the work. There is one machine yard thirty miles north of us, at Audubon, that makes a pretty good brick. They burn in the common down-draft kilns and make about a million each season. We have two yards here that will make about 500,000 each this season. The country is improving considerably, but there don't seem to be very much demand for brick. Our towns are built up ahead of the country. While they were building we made and sold here about three to four million brick a year. There don't seem to be any clay west of Des Moines fit to make a good paver, at least there is no yard that I know of that is working that kind of clay. Prices are pretty good here. Brick sell from $5.50 to $9 per thousand. The trouble is, not enough of them are sold. The brickmakers in this part of the country are not loaning any money out of the profits of their business. If the times are so prosperous (as some people claim they are), I believe the brick business will get better year by year, as lumber gets higher. The buildings of the future must be largely of brick, but the trouble right now is that some of us cannot afford to wait. Yours truly. H. J. C.

Atlantic, Iowa, Oct. 18

The Chicago Brick and Building Situation.

EDITOR CLAY-WORKER:

With a seeming premonition of a Republican victory, Chicago's building interests for October exceeded any previous month of the year. The local real estate transfers for the month—items of $1,000 and over—amounted to $7,210,112, as against $6,538.609 for September. The building permits exceed in value any corresponding month for the past eight years. A great many of the permits are for residences and flats. Among the larger buildings for which permits were issued is the Marshall Field retail building, representing $1,500,000. The total estimated cost of buildings covered by permits for October is $3,914,090. As September permits showed only $2,347,200, the gain is something that shows more than confidence in existing conditions, or at least a confidence that conditions would not change for the worse, and in this respect Chicago contractors and material men may congratulate thmeselves that they are not to remain in enforced idleness until the financial policy of the country is decided upon. The architects report increased business in both new and prospective work. Common and pressed brick, stone, lime and cement and mill men report increased trade, and as for the contractors and unions, their differences are items of history. In spite of labor troubles, poor markets and an election year the outlying districts of the city have come to the front with such men as S. E. Gross, E. A. Cummings & Co. and Sam Brown, Jr., purchasing and building, and now comes a well defined rumor that a syndicate of North Carolina lumbermen, with John Hulla, Jr., as their architect, will erect 150 houses in the southwest section of the city in the early spring. The estimated cost of the improvement will be $300,000. The Chicago Real Estate Board are planning an innovation in real estate booming, and the scheme will be voted upon at the annual meeting in December. They contemplate an industrial promotion committee of five, whose functions will be to conduct a bureau of information in Europe regarding the advantages of Chicago as a manufacturing point, its advantages as a railroad center, and information as to locations, prices, etc., carrying advertisements in all European dailies stating that the Chicago Real Estate Board is prepared to furnish all particulars to foreign industries wishing to locate in Chicago. For a time, at least, politics will no longer dominate the labor unions. The Building Trades Council has no place in the daily news items of our press. The once aggressive president, Edward Carroll, was dismissed with little ceremony a month ago, and now comes the national association, which disposes of him with the same promptness. The structural iron workers and plumbers have gone through the formality of withdrawing from the council, and the council itself, since the recent upheaval, has witnessed the resignation of its new vice president and treasurer. The past month was particularly free from assaults, but acts of vandalism occurred where stone work (non-union) was damaged to the extent of hundreds of dollars. The new Catholic church at West Fourteenth street and Springfield avenue has four damaged columns, broken sills, etc., to the extent of $800; a North Side apartment building, chipped sills, ruined water tables, etc., and a fine residence in Sheridan road, where carvings, sills and other stone work were given heroic treatment. The police, as usual, were not available, and in fact done little towards apprehending the culprits. Joseph Sullivan, business agent for the Stone Cutters' Union, indignantly refutes the intimation that possibly his union is responsible for the lawlessness, so the authorities are obliged to attribute the damage to the irrepressible small boy, and the contractors at the various jobs replace the damaged work and charge it up to experience, possibly with a mental calculation as to how much a night watchman's expense would have been compared to the extra work. In pleasing contradiction to the usual outcome of the differences between union and non-union labor is furnished the 6th inst., wherein a man named Patterson, steward for the Bricklayers' Union, in endeavoring to convert (?) a non-union man, got the worst of the argument, and is now in the hospital with a fractured skull, and every prospect of soon being in the realm of beatitude, where the non-union man will not concern him. It is rumored that work on the Chicago postoffice will now be pushed, and there is every reason to believe that the young Chicagoan of to-day may see in their ripe old age a completed building which will be a credit to their town. Election night was observed by both the Builders' Club and the Chicago Masons' and Builders' Association in their respective quarters. The Masons celebrated in a decorous manner, serving coffee, lemonade and light refreshments to members and guests. As for the Builders' Club, they had decorum with a big D. Red lemonade and enthusiasm was the order of the evening, and every one was filled with enthusiasm, and as the later returns came in the old walls of the former Board of Trade building must have felt that they were again in the presence of the bulls and bears of thirty years ago. The next day one of the members said that none of them got under the tables anyway. It has since leaked out that the tables were removed early in the evening. VERITAS.

Chicago, November 12.

In and About Pittsburg.

Editor Clay-Worker:

Important developments in the fire clay industry are being made along the line of the new Pittsburg, Westmoreland & Somerset road, which traverses a new and undeveloped section of Westmoreland and Somerset counties. Fire clay and silica deposits of great extent have been discovered at several points along the new road in the Laurel Hill mountains, and the new deposits are to be worked, plants being now contemplated at several points.

At a meeting of the officers of the United States Clay Manufacturing Company, held at the headquarters of the concern, in the Empire building, in this city, lately, it was decided to erect a new plant on the line of the Pittsburg, Lisbon & Western road, near Lisbon, O., where the company has recently acquired a tract of 183 acres. The land is underlaid with coal, and mines will be opened to supply the new plant. Large-sized sewer pipe will be manufactured exclusively at the new works, which will be run in connection with the other plants of the

company located in the Pittsburg district. The new plant will cost $200,000, and will employ about 200 men.

Ground has been broken by the Pennsylvania Fire Brick Company, of Lock Haven, Pa., for the erection of what will be the largest fire brick plant in central Pennsylvania. The company is capitalized at $180,000, and the new plant will have a capacity of 25,000 bricks per day. The new plant will be located at Beech Creek, a few miles from Lockhaven, and the clay will be obtained from a tract of 800 acres of fire clay land owned by the company. The new plant will be ready for operation about January 1 and will employ 160 workmen.

The South Fork Fire Brick Works, located at South Fork, Pa., near Johnstown, has begun operation the past month. The plant has a capacity of 25,000 brick per day. It is located near the site of the fatal dam, the bursting of which destroyed the city of Johnstown eleven years ago.

A contract for supplying about 1,000,000 brick for use at the mines of the British Columbia Mining Company, a coal mining company located at Crows' Nest Pass, British Columbia, has recently been placed with the Harbison & Walker Company, of this city. W. R. Wilson, a former well-known Pittsburger, who is now in charge of the mining operations of the Canadian concern, visited this city recently and placed orders for various machinery and supplies to the amount of $100,000 with Pittsburg manufacturing concerns, the brick contract placed with Harbison & Walker being among the big items of the contracts.

Negotiations are under way for the erection of a large brick plant at Park Quarries, near Freedom, Pa., by a new company, to be known as the Park Quarries Stone and Brick Company. The concern is capitalized at $150,000, and the stock is understood to have already been subscribed. The plant contemplated will turn out 100,000 red brick per day, and large stone quarries will be operated in connection. The company owns a track of 50 acres and about 30 dwellings on the site. The plant to be erected will be a thoroughly modern one.

James B. Hammond, of the Reese-Hammond Fire Brick Company, of Bolivar, Pa., was recently married, and in honor of the occasion the whole town of Bolivar turned out and made merry. Beside his important connection with the big fire brick company, Mr. Hammond has been active in Pennsylvania politics, having served several terms in the Legislature from Westmoreland county.

The Consolidated Fire Brick Company, whose offices are at Akron, O., and whose plants are at Akron, Canal Dover and Midvale, O., have lately received a contract for 600,000 fire brick from the Columbia Chemical Co. This concern has a daily capacity of 500 tons of clay products.

Before the election the Pittsburg and Buffalo Coal Company placed with Pittsburg concerns orders for various machinery and supplies, aggregating half a million dollars, a provision in all the contracts making them void and null in case Bryan should be elected. Now that the contracts stand they will be filled at once, and the concern will at once open a new coal mine and erect a large brick plant. The Jeffrey Manufacturing Company, of Columbus, O., will supply the brick machinery for the new plant.

Through a fire at their plant a few weeks ago the well-known Pittsburg brick firm of Sankey Bros. sustained a loss of about $5,000. The fire originated in its kilns and is thought to have been caused by tramps.

The clay deposits of the Allegheny valley are just now attracting almost as much attention as the coal fields of that section, and it is the prediction of many clayworkers that before long the valley will become the center for the brick plants of the Pittsburg district. Already a number of Pittsburg brick concerns are making arrangements to secure clay deposits in that direction.

The Central Brick Company, of this city, is unusually busy just now filling extensive orders received from different parts of the country.

The Pittsburg and Buffalo Coal Company will make important additions to the silica and fire brick plant, located at White Rock, on the Allegheny river.

During the past few months there has been much dispute in the Councils of this city over extensive contracts for asphalt paving to be awarded. Proposals have been received several times, but as yet the fight is not concluded. The Empire Asphalt Company and the Pennsylvania Asphalt Company seem to be the principal bidders.

In no other section of the country will the election of McKinley prove more beneficial from an industrial standpoint than in the Pittsburg district. During the past two or three months and up to the time of the election there has been considerable hesitation on the part of manufacturers and consumers, and in some instances industrial establishments, practically suspended operations until after the election. Before the election many of the big contracts placed in Pittsburg and elsewhere contained provisions annulling them in case of Bryan's election. The manufacturers contemplating additions to their establishments and those proposing to erect new plants took this precaution to insure against the industrial depression which would have very likely followed a change of the administration. Clay manufacturers, like all other industrial workers, felt this indecision. However, this is no longer in evidence, and during the coming year there is certain to be some wonderful developments in the clay interests of western Pennsylvania.

GILBERT.

From The Kentucky Metropolis.

Editor Clay-Worker:

The brick season here will close with one of the best years in the business. Practically all have done good business, and with about one exception have sold off all the stock on hand. Dumesnil & Co. have some stock yet, which they have refused to let go at prevailing prices, and which they expect to realize more for early next season.

Miss Hattie Clay says that she has recently booked quite a nice order, and expects another one, even if it is late in the season.

Mr. Owen Tyler said that there was nothing new to say about the business, it being now simply a rounding up of season closing orders, etc.

Mr. Trigg said that he had made no new contracts since last writing, and did not care to make any more, for he has all he can do to finish up the contracts already on hand for this season.

Mr. McCullom, who makes about a million brick a year here, says that the season is about over, and that his stock is pretty well exhausted. He said he thought this city had put out about sixty million brick this season, and all had done a pretty good business.

The additions to the St. Xavier College here, which is under course of erection at this writing, is taking about 800,000 brick, all of local make. The contractor in charge of this work is Jacob Haertz, who also has another contract on hand for this season.

The pottery plant here, known as the Preston Street Pottery, John Bauer proprietor, has been having a fair business, and is shipping its product to practically all the States south of here. When I got to talking to them about the business, however, it was pointed out that prices had been reduced so by competition in the last ten years that the margin on the work was often rather close now. This plant has been an industry of the city here for going onto two decades, and employs about thirty-five hands. They have four kilns, two of 10,000 gallons' capacity, one 5,000 and another of 2,500. They make all kinds of earthenware for which they get most of the clay in the neighborhood of Huntingburg, Ind.

THE COLONEL.

Pacific Coast News.

Editor Clay-Worker:

The local building interests are still dull. A few large iron buildings are being erected, creating some demand for tile. The general prosperity must soon be felt in reality, and will increase the demand for the products of our Pacific coast yards. All dealers in brick complain that trade is dull, but they anticipate a greater demand soon. The manufacturers view the future with a feeling of confidence.

Clark & Sons' pottery, in Alameda, Cal., is very busy. They will supply the pressed brick and architectural terra cotta for the new library building being erected in Oakland, Cal.

P. McG. McBean, of Gladding, McBean & Co., left for the East about the middle of October. Mr. McBean will visit the modern yards in the central and Eastern States with a view to adopting the latest improved methods in the yard of their company, located at Lincoln, Placer county, Cal.

The Steiger Terra Cotta and Pottery Works have been awarded the contract to furnish terra cotta for the Crocker estate building, being erected on the corner of First and Mis-

sion streets, in this city. The contract amounts to between $25,000 and $30,000.

It is reported that recent visitors to Magnolia, Cal., from Los Angeles have the establishment of a brickyard and tile factory in view. Samples of clay taken to Los Angeles for analysis have been found to be of the very best quality for high grade brick and tile.

E. M. Oudin has brought action in the Superior Court of Spokane, Wash., for an order to compel Martin L. Bergman to account for $10,000, claimed to belong to the Oudin & Bergman Fire Clay, Mining and Manufacturing Company, of Spokane. He claims this amount at least has been misappropriated. The complaint alleges that E. M. Oudin, C. P. Oudin and Martin Bergman formed a company to engage in the pottery business, E. M. Oudin advancing all the cash—$10,000—to purchase the plant. That in 1896 business became bad, and Bergman was left in charge of it while the other shareholders looked after other business affairs. That early in 1898 business became flourishing, but that Bergman concealed the facts from the Oudins, and made false statements that the plant was not paying, when in reality it was making large profits. That during the time between the departure of C. P. Oudin from Spokane, in September, 1896, until his return, June, 1900, Martin L. Bergman received large sums of money belonging to the company as profits of the company's business, all of which he has appropriated to his own use and still retains. That the books show a large number of open accounts against customers for goods sold, amounting to over $3,400, and Bergman claims that these customers have not paid the money to him, and the customers claim that they have. While C. P. Oudin was absent, it is claimed that Martin L. Bergman and John Bergman entered into a conspiracy together to establish a rival pottery for the purpose of wrecking the business of the company. It is also claimed that the defendant used money belonging to the company in buying up large tracts of clay land near Mica, from which the company had always drawn its supplies, and had it conveyed to his brother John.

The Holt & Gregg Company is burning a kiln of 700,000 brick at its yards, near Anderson, Cal., and another kiln containing 800,000 brick is almost ready for firing.

W. T. Lawrence, a practical tilemaker, has arrived at Santa Ana, Cal., from Elwood, Ind., having been engaged by J. B. Raine, of Westminster, to take charge of the new drainage tile plant soon to be started there.

The Harper Brick and Pottery Company, whose works are located near Colby, Wash., about ten miles from Seattle, last month burned its first kiln of bricks, and is now engaged in putting in a large steam dryer that will enable them to continue manufacturing brick throughout the winter independent of the weather. The capacity of the new yards will be, when the dryer is completed, one million per month. They will manufacture only common brick at first, but later on vitrified and pressed brick. The brick will be brought to Seattle in barges, and the company intends, in time, to construct a large line of barges of its own for this purpose. The company has recently increased its capital to $15,000.

The brick and lime works of the Mansfield Manufacturing Company, of Nelson, B. C., a corporation backed by the personal funds of Ernest Mansfield, will this year turn out about 1,750,000 brick and 700 tons of lime, and this will be greatly exceeded next year. The demand has been found excellent for both products, and arrangements are said to be under way for large shipments to the old country.

A kiln of 640,000 bricks is being prepared for burning at the asylum at Napa, Cal. Brick buildings are to be erected on the farm.

Mr. Pierce, of Toro Creek, Cal., is building a brick kiln of 400,000 bricks.

One of the indications that building operations in Reno, Nev., will be heavier next season than ever before in the history of the town is to be seen in the preparations being made at the brick yards. Burk Brothers have just finished a kiln of 250,000. Booth is burning another quarter of a million, and 350,000 brick have just been burned at Ryland's yard. A total of nearly a million and a half brick are already on hand. Although a majority of this total were manufactured in mere anticipation of their demand, still there have been sufficient buildings planned and contracts let to use up a goodly proportion of this number.

Gold Hill, Ore., is well supplied with brick for the coming season. Kellogg & Darling have just finished burning a large kiln at their yard, and Stantenger & Stickle at their yard.

C. P. Brunker, of Vernal, Utah, has arrived at Price, Utah, and has commenced work on his new contract for brick for the new schoolhouse. He will burn some 200,000.

The Seattle Brick and Tile Company, of Seattle, Wash., has increased its working force gradually for the past three months, and now has a large number of men employed. Manager Nediegaesoes says that business is increasing constantly. The firm finds a ready sale for its product, for the most part in Seattle and vicinity. It ships to outside points also at the rate of about seven carloads a week. Some new machinery has been added recently. SUNSET.

San Francisco, Cal., November 5, 1900.

Arkansas Brick Bats.

EDITOR CLAY-WORKER:

At Malvern, Arkansas, as at many other points in the South, desirable laborers are difficult to secure, and although the region is splendidly timbered, wood is scarce, owing to the same cause.

Last year the works of the Clark Pressed Brick Company, at Malvern, consumed 5,000 cords of wood, and now 250 cords go up in smoke per month, and 200 tons of coal, as the management has taken time by the forelock in building two coal kilns, and are building a third, when they will have three for wood and three for black diamonds, but three more coal kilns are in contemplation. The works have three Boyd presses—daily capacity of 50,000 brick—the manufacture consisting of fine front, ornamental and common brick, and fire brick and fire clay are shipped extensively. The Clark Company began operating in 1889, and the last two years have been the most prosperous. Forty-five men are employed, and a number of them have been with the company from the first kiln, and it is a corporation which has never had a strike or disagreement whatever.

There is a fifty-acre farm, with the yards, where they raise corn and provender generally—have twenty-two mules, good stables, blacksmith shop, commissary and welle-quipped offices —the plant and land having cost $70,000 up to date.

The president, C. W. Clark, is the noted contractor of Little Rock, who employs 250 men at a time, and has erected many of the noblest structures in the State. The secretary and treasurer is one of the best known men in the hardware world and progressive as he is popular.

The manager, Captain Louis Meyer, has in a great degree aided in the works being so prosperous, and he has the happy faculty of keeping everything in harmony. Captain Meyer was born at sea and became a sailor, rising from before the mast to the quarterdeck. On land he has also been successful commercially, and for a number of years was milling on the Iron Mountain, and for nearly eight years has been manager of the brick company, and is as popularly known as from Dan to Beersheba.

At Camden, Ark., a big cotton town and market, and railway division, several brickyards have been started in the past, but did not pan out, the same cause being ascribed in every instance—too much sand in the clay. A practical brickmaker will make another venture next spring.

The Pine Bluff (Ark.) Brick Company are putting in coal kilns, intending to dispense with wood altogether.

The late Samuel Leflar was burner at those yards for seventeen years with Edgar Brewster, who was founder and is president of the company.

On the Little Rock & Hot Springs Railway, in operation about a year, small kilns have been started by the new aluminium companies, and at famous Old Benton the pottery works are turning out the little brown jug, as usual.

A. R. KANSAS.

Down in Jersey.

EDITOR CLAY-WORKER:

As I commence this letter it rains again, but your many readers must not think that it rains in Jersey all the time. So far this fall we have had quite a number of cloudy days, with some rain now and then, but for all that the weather is very pleasant.

Well, if it does not come a big snow storm on next Tuesday, the 6th, the country will no doubt go on and be prosperous, as it has now been for at least three years.

Whew! what a turmoil this confounded election every four years does make. I have heard many speeches—Republican, Democratic and Prohibition—and if one is to believe all he hears the whole country is rotten to the core. I am beginning to think that the only honest men are the clayworkers., for if they don't give good measure in size of brick they make, their names will be mud before long.

Considerable progress is being made in the vitrified brick

pavement business in New Brunswick, N. J., and Perth Amboy, N. J. In the first named city bids are asked for the paving of Townsend street, between Livingston and Lee avenues. Work is already under way for the same kind of pavement on Schurman street, between Livingston avenue and George streets.

At Perth Amboy bids are in order for the paving of New Brunswick avenue, from Smith street to Dublin Station, on Lehigh railroad, about seven or eight blocks. So you see the leaven is working, and before long I hope to note many more streets in line for the same work. These brick should be made here from the red shales and clays we have at hand in such an abundance, thus returning to the taxpayers a large percentage of cost in wages.

The removal sale of The C. Pardee hollow brick plant is a fact. Consideration is said to be $324,000. The plant is a very valuable one and well located. The enameled tile department is now under the management of Mr. Boehm, formerly of Philadelphia, and is turning out some nice work.

The Standard Fire Proofing Company, of Perth Amboy, is now shipping electric conduits to London, England, to fill a large order. These conduits are made about four feet long and with from two to six compartments, and thoroughly glazed inside and out, the same as sewer pipe. The conduits are placed aboard barges at the factory and towed to New York and there loaded directly into the hole of the ocean steamer. It seems strange that our brother brickmaker across the ocean cannot furnish these articles. If Brother Lyle gets after an order it is almost dead sure that it comes his way.

Mr. Stacy Tuttle, formerly superintendent of this plant, has once more returned to Mexico, to take charge of the plant there owned by the Standard people. He will stay three years this time. Before leaving the employes of the Standard Company gave him a handsome gold chain to attach to the handsome gold watch presented to him by the Mexican employes just previous to his return home the last time. We wish Stacy abundant success in the new clime, and if hustling will do the business there is no question of the result.

New buildings are still going up in the city of Perth Amboy. During the month the pressed brick front placed in several of the Haines & Campbell new buildings, on New Brunswick avenue, Perth Amboy, took a tumble into the street during the night time, causing quite a loss as well as quite a muss. This firm has been particularly unfortunate since beginning of operations in Perth Amboy. Some frame buildings being erected upon State street were about ready to turn over to the owners when a fire was discovered during the night. Before enough of aqua was used about one-half of the buildings were destroyed, with not enough insurance to cover the loss.

At present writing the Perth Amboy Traction Company are operating their new extension as far as Keasbey. As soon as a bridge can be built over the Raritan Hollow Brick Company's reservoir the track will be extended to the Keasbey school building. Now that the borough Council has given permission to enter this village, we expect this trolley line to be continued on to Metuchen at once.

We have now under way at this place a very large brick building to cover the plant of the Central Electric Company. This plant is designed to furnish lights, etc., to Metuchen, Plainfield, New Brunswick, Rahway, Woodbridge and Perth Amboy. The building will require 800,000 brick, which Sayer & Fisher, of Sayerville, are filling. Mr. Richardson, the general manager of The Central Company, informs me that this central plant is made necessary in order to keep everything up-to-date, and even if the smaller plants were continued they would have to be rebuilt. This consolidation will, without a doubt, be a great saving eventually, and will also give the several towns and cities the benefit of all the latest improvements.

At New Brunswick the old Opera House that has been an eye sore for four years, is now being torn down so Uncle Sam can commence the erection of the new government building on the site. We have not learned, as yet, whether the contract has been let for this structure or what material is to be used.

One week ago Peter Fisher, of Sayer & Fisher, the noted brickmaking firm of Sayersville, celebrated his eighty-second birthday. A large number of relatives and friends joined in the celebration. The firm of Sayer & Fisher commenced business in a very small way. They now employ 1,000 men when all departments are on full time.

The Standard Terra Cotta Works, at Perth Amboy, are running again. The old Perth Amboy Terra Cotta Works are running on large orders and employing many men. The Atlantic Terra Cotta Company, at Tottenville, just across the Sound, are also busy.

A visit to the Cliffwood Works, of the Star Brick Company, during the month, shows a new winter yard under way. This is something unusual in the common brick line, but no doubt the firm have great faith in the future. They have one of the best locations in this section, with acres of clay forty feet thick, and good shipping facilities via Central Railroad, of New Jersey, and Pennsylvania Railroad, with tracks right under the kiln sheds. They were still molding three weeks ago.

Perth Amboy, N. J., Nov. 1, 1900. W. R. O.

INCREASE OF WEALTH; ITS CAUSE.

Mr. L. G. Powers, who is connected with the Census Bureau, has made some statements regarding the wealth of the United States which are entitled to special attention because of his work as a statistician, as the head of the Minnesota Labor Bureau. In the service referred to he proved by a comparison of absolute facts that the agricultural people of Minnesota were not objects for commiseration, as demagogues made them, but that those of the present time are in a much better financial position than their predecessors. So much being said regarding Mr. Powers's ability as a statistician, let us turn to his estimate of the wealth of the United States, which he puts at $90,000,000,000, against $65,000,000,000 in 1890. When the figures of the census are given they may not agree with this estimate, but the chances are that they will. If the estimate is near the fact the wealth of the United States has increased over 38 per cent. during the past decade, or nearly twice the ratio of increase in population. Mr. Powers says the savings of the American people the past decade represents more than the inhabitants of the new world had been able to accumulate from its discovery by Columbus to the American civil war. Further, it represents more than the people of the whole world had been able to accumulate from the time of Adam until the discovery of America. These are startling assertions.

This wonderful accumulation, says the Indianapolis Journal, means more than so many billions of dollars in property, since it means that the people of this country have more of everything they want than they have ever had before, or than any people in the world ever had before. At no period in the country's history has a day's labor represented so much in the comforts of life. This is proved by the fact that above the best living that any people enjoy the people of the United States are accumulating savings. Many are getting rich, but millions are accumulating property.

This increase of wealth is due to the much greater capacity to produce. Years ago men labored more hours than now and received less compensation, but the wonderful increase of the country's wealth did not appear until the era of labor-saving machinery. It is said that labor produces all the wealth of the world, but it is not true, for the reason that the machinery which capital and brains have produced has enabled labor to multiply its production. This is true in every branch of productive industry. Fifty years ago men worked harder than now, but they did not produce any part of the surplus wealth they now produce because they were not assisted by steam and like power and the machine.

PERSONAL MENTION.

E. E. Gorton, formerly in charge of the enameling and ceramic department of the American Terra Cotta and Ceramic Co., but more recently with W. D. Richardson at the works of the Ohio Mining and Manufacturing Co., Shawnee, O., has, with Mr. Richardson, severed his connection with the latter company, and is now open to an engagement. Mr. Gorton is an authority on all clay glazing and enameling work, and will prove a very valuable assistant to any fir mwanting experienced help of that character.

A. F. Barron, of Chicago, Ill., shed the light of his genial countenance in The Clay-Worker sanctum one day this month. He was in a very happy frame of mind, having booked an order for a dryer for the Western Brick Co. for its new plant, to be erected near Danville, Ill. Mr. Barron says he has made a number of improvements in his dryer, by which the brick can be dried even more economically than heretofore. He says trade has been good right along and that there is every indication of a continuance of this happy condition.

J. W. Hornsey, who for a number of years has been general manager of the Cleveland Car Co., has severed his connection with that firm, and will in the future his entire energies to the with the firm, and will in the future devote his entire energies to the Crown Dryer Co., see ad on page —. Mr. Hornsey is a practical brick man, an experienced salesman and an all-around the faith within him, that that system affords the most ef- the faith within him, that that systems affords the most effective and most economical method of drying brick.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SEVENTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIV. NOVEMBER, 1900. No. 5.

CURRENT COMMENT.

The first of the State conventions is that of the Illinois Clayworkers' Association, which is to be held at Springfield, Ill., January 8 and 9. It has been several years since the Illinois clayworkers met at their State capital, and it is anticipated that an increased attendance will mark the coming meeting. We hope to publish the complete programme of the convention in our next issue.

* * *

Speaking of the new brick office of the Purington Paving Brick Co., in our last issue, we said: "If any of our readers or contributors know of any brick office that they think as good or better, we will be pleased to have them send photos for illustrative purposes." Taking us at our word, Gates sends us a photo of the factory office of the American Terra Cotta and Ceramic Co., and it is given the place of honor in this issue. Next!

* * *

Those of our readers who are haunted with the trust specter may take comfort from the observations of L. C. Moore, given in his articles on a preceding page, entitled "The Trusts and the Small Brick Factories." After reviewing the situation thoroughly, he comes to the conclusion that the small factory has a field all its own, and that the small manufacturer who thoroughly understands his work and carries it on in a business-like manner has little, if anything, to fear from great corporations or trusts. This is a rational view. We have never believed the brickmaking industry to be one that can be monopolized to any great extent.

THE NEXT NATIONAL CONVENTION.

There are conditions, local and personal, that make Old Point Comfort an ideal place for such a gathering as the annual convention of the N. B. M. A. The location of Old Point is par excellence. Near Fortress Monroe, looking out over Hampton Roads, but an hour's ride from Norfolk, and the same from Newport News, still nearer the city of Hampton (to say nothing of the town of Phoebus,) and within easy reach of the home of the Linn Haven oyster. Think of all these points of interest and others of historic interest, and the comforts afforded by the Chamberlain, and you must admit that the attractions are well nigh irresistible. Seated in the beautiful parlors of the Chamberlain, with a little imagination, and a little of other things, one can look out on the magnificent sheet of water and recall great incidents in the history of the Nation that makes one proud of his country and his people. These local conditions will surely insure a large attendance.

The personal conditions relate to the universal prosperity that has been felt by the brickmakers throughout the land. Clayworkers generally have been making money, and can well afford a brief season of rest and recreation. The convention at Old Point will be interesting, unique and beneficial to all who participate. Make a note of it, February 11 to 16, and lay your plans accordingly.

THE CLAYWORKER'S THANKSGIVING.

Seldom, if ever, have the American people had such an occasion for thanksgiving as they have this year, if we measure our debt of gratitude by the more agreeable experiences of life. While there have been many individual cases of great sorrow, and adverse business tides have stranded some, the year has been marked for the prevailing health of the people, and the laborer in every field has been blessed with unusual returns for his toil. The soil has never better rewarded the tiller, and the mechanic and artisan and the most humble day laborer have all found employment at remunerative wages.

Local calamities, like that at Galveston, have occurred to remind us of the insecurity of earthly possessions, and to give us occasion to bear one another's burdens by ministering to the wants of the needy, but these have been so few and far between as to be hardly noticed amidst so general and generous prosperity as has marked the year.

However much of the occasion of gratitude may be attributed to well-directed skill and labor, our Thanksgiving day is intended to remind us that back and above human instrumentality is a divine hand which gives the increase. This is seen no more in the timely rains and sunshine that work together with the farmer in producing a harvest than in the results of the mechanic and artisan. Beyond doubt, without work there can be no bread, but work may be so misdirected as to produce unsatisfactory results; but our interests are so interlocked that the prosperity of every man is affected by the failures or successes of every other man; hence no one can suffer without causing others to suffer, and on this fact hinges the importance of economic measures which extend beyond the dooryard of the individual. Doubtless, therefore, our present occasion for thanksgiving is not only due to the well directed labors of the individual, but to the wiser economic measures which have added to the general welfare of the whole by making the labor of the wage earner contribute to the wealth of the employer, who in return not only gives employment, but better wages. For this condition of productive industries we are to be thankful, and all the more thankful because an unusually large majority of the producers of wealth have resolved by their vote to make no material change in the economic conditions that have produced the present condition of affairs.

No industry can enter more heartily into this thanksgiving than the brickmaker. The season has been one of unsurpassed demand for our output at remunerative prices, and we go into winter quarters, as far as it may be said the modern brickmaker ever rests, with the promise of even better times than ever before us. The Clay-Worker, therefore, not only joins its thousands of readers in their public and private thanksgiving, but it heartily enters into the festivities of the occasion, and becomes a partaker of the good cheer of every happy household into which it has so long been welcomed.

We need not add be generous and helpful to those less for-

tunate, and let everybody be thankful. It would be unpardonable of The Clay-Worker did not itself enter heartily into this thanksgiving after a year of such prosperity while helping others to prosper.

BRICK PAVEMENTS.

During recent years exceptional matter has appeared in The Clay-Worker on the subject of brick pavements. Brick pavements, of course, always received full and adequate support from this journal, but never without full confidence in the justice of our opinions. We feel now that we are able to assert that the public is coming to believe that the brick pavement is the ideal pavement. That brick, on a proper foundation, properly laid, comes as near being the everlasting pavement as anything that has yet been brought before the public.

Asphalt and wood pavements have been wonderfully advertised, and an ignorant public sentiment has been developed in years past in favor of these materials.

It is only a short time ago that Buffalo, with its miles of asphalt, was regarded as the ideal paved city. Now, it may be safely said, that Buffalo stands as an example of the disrepute of that material.

The only satisfactorily paved streets which we have in this city are those paved with brick. Brick are now being laid where it is known that asphalt cannot stand, namely, in the gutters and between the street car tracks; but strips where any material would stand have been laid in asphalt. The asphalt has been laid more in deference to sentiment than to reason.

We predict with confidence that within the next two or three years brick as a paving material will be the predominating covering; provided, however, that the brickmakers make the brick as well as they know how and as well as they can be made. Brick pavements have suffered more at the hands of brickmakers than they have from the public. There is no better paving material than a good brick, and there is no worse paving material than poor brick.

COMMERCIAL CLUBS.

Once upon a time it was said that if there should be ten righteous men in a certain city, we believe it was Sodom, that that city should be saved. It might have been Jerusalem or any other city, that makes no difference, the principle is the same. Ten men working to a common purpose, ten men of average brain capacity, character and tenacity, can do about anything they undertake to do. This principle illustrates the success of commercial clubs, boards of trade and town and village improvement societies.

In many cities of this country, and in most large towns, there are commercial clubs and other organizations which vie with one another in the improvement of cities and towns. The city of Indianapolis has been peculiarly successful in this matter. Our city has beautiful, clean streets, not all too well made, but they are clean, well cared for, we have a splendid system of sewerage, and many other municipal benefits leading to comfortable living.

The Commercial Club, a civic organization, has had more to do with this than the city government. Its members have created a public sentiment, they have helped to educate the people, they have developed public pride, furnishd the backing and moral support which has enabled the city government to move safely along the line of a high class of improvements. Every town or city in the United States should have a similar organization. It improves the city, it makes business for brickmakers, and does other work which is to the business interest of contractors and others dependent on the will of the public.

A body which safeguards the welfare of a town or city in an organized way has much more power and force than is possible through any public sentiment which is disorganized. Men will come together and vote on a proposition for improvement and use their best endeavors along that line, which, as individuals, they might oppose. Once committed in such a body they must stand together.

We have no doubt that there are many other organizations throughout the country which are quite as influential and quite as beneficial as these commercial clubs of which we speak. Boards of trade, as organized bodies, have the same determining influence. A builders' exchange in a large city helps to crystallize public setiment. What we have to urge in the interest of the brickmakers of this country is that there should be in every city a commercial club, in every town a similar organization, and in every village an improvement society.

GENERAL PROSPERITY.

General prosperity we have had, and general prosperity is still with us. The brickmakers know this. They have been getting good prices for their product, and the people are satisfied to pay a good price. More building is done on relative high prices for building material than is done on the very low prices. When everything is dead and the brickmakers are cutting one another's throats nobody wishes to build. Brickmakers had better lay down when the public does not want to buy rather than to force them to buy. Added activity under such circumstances means enforced low prices. We do not know of a brick manufacturing establishment in this State that is not now working to its full capacity and getting fair prices. The sale of brick is practically the thermometer which indicates the high or low conditions of business vitality in any section.

TRADE LITERATURE.

WE ARE IN RECEIPT of a very pretty little brochure from J. C. Boss, Elkhart, Ind., in which he tells of a new process of burning brick by which a decided saving of fuel is accomplished and a more even and better product assured. Mr. Boss's system, as described in the book, embodies a forced draft, which permits the use of cheap grades of coal and other kinds of fuel. He will be pleased to send a copy of his little book to any of our readers who will write him for it.

THE NEW YORK BLOWER CO., Bucyrus, Ohio, have out a new and very handsome catalogue. The cover is embossed in gold, blue, terra cotta and gray, and is as pretty as pretty can be. In it is illustrated a complete line of exhaust fans used for heating and ventilating purposes of all sorts. It also contains a series of tables of the speeds, capacity and horse-power required for various purposes, and much more valuable information to those interested, to whom a copy will be sent gratis on application.

WE ARE INDEBTED to the Columbus Brick and Terra Cotta Co., Columbus, Ohio., for a copy of their new catalogue of plain, molded and ornamental pressed brick. It is a large and beautifully illustrated book. The first illustration is a fine half-tone view of the new railroad station at Union Furnace, Ohio, where the factory is located, a handsome building constructed of their brick and roofed with clay tile. Next is a birdseye view of their plant, which makes a very pretty picture in black and white. Then follows a series of plates showing plan of works, location of clay mines and various forms of ornamental brick, which they make in endless variety, interspersed with which are a series of views of prominent buildings in all sections of the country erected of their brick, including spendid residences, great flats, government building and sky-scrapers. It is a work that ought to find a place on the desk of every architect.

WHY THANKFUL?

What are we thankful for?
That is a question
That sometimes puzzles e'en a dinner guest;
The rich are thankful for a good digestion,
The poor if they have something to digest.
—G. B., in Judge.

CAUSES FOR THANKFULNESS.

For all that God in mercy sends;
For health and children, home and friends,
For comfort in the time of need.
For every kindly word and deed,
For happy thoughts and holy talk,
For everything give thanks!

For beauty in this world of ours,
For verdant grass and lovely flowers,
For songs of birds, for hum of bees,
For the refreshing summer breeze,
For hill and plain, for streams and wood,
For the great ocean's mighty flood,
For everything give thanks!

For the sweet sleep that comes at night,
For the returning morning's light,
For the bright sun that shines on high,
For the stars glittering in the sky,
For these and everything we see,
O Lord, our hearts we lift to Thee,
For everything give thanks!
—Ellen Isabella Tupper.

Written for The Clay-Worker.

*HAIL TO THE PROPHET OF THE WABASH.

I hail thee, Seer and Prophet, truthful Randall of the Wabash,
(Where the moon shines fair at all times, but in campaign times the best):
Had I listed to thy seering, I'd have saved a lot of hard cash,
And have shown a gleam of wisdom bright as any in the West.
Had I listed to thy seering. Oh, great Prophet, what possessed me
That I cracked my ribs with laughter at the words you had to say?
How more soothing to my feelings did your promises arrest me,
Had I opened up my think tank to the sense you threw my way.

I remember, I remember! It was just before November—
(Sure, I never can forget it for the fun it caused me then)—
How you told us we were "co-opered," or some such, I disremember,
And my mirth was mixed with pity for you, foolishest of men,
Thus I called you "Poor old Randall," "Off his nut," "He's chasing fairies,"
When you told me (not in German): How that vote was going yet,
And I tossed my head and chattered, "Randall's counting Mother Careys,"
And there wa'n't a soul around to lug me in out of the wet.

When you told me Indiana was to go hell-bent for Hanna,
And McKinley and the Cowboy were to steer the Ship of State,
I just took a squint at Croker and said, "Randall, you're a joker,"
Just you watch us until Tuesday wipe you, smack'o, off the slate.
I am wiser now and older, and the day has grown much colder,
And my hard-earned dough is weighing down the pockets of my friends,
And I've learned to watch o'mornings for, aye, other timely warnings
You might deem worth while to send me (if yet time to make amends).

Had I listed to thy seering, I'd have dodged a lot of sneering,
And have gathered in some shekels to offset Salt River tide,
And my heart would be less ailing as I watched my Country sailing
In its fearful swope and falling down the Trust Toboggan Slide.
So I hail thee, Seer and Prophet. (Hold 'er hard and don't get off it.)
Prophet Randall, of the Wabash, where the moon shines always bright,
When there comes the next election send me quick your own selection
Of the winners, and I'll follow, though you lead me out of sight.
—BRIAN J. DUNN.

*The Editor wrote to Mr. Dunn early in October, advising him of the political situation in Indiana, assuring him that the Republican plurality of four years ago would be about doubled and warned him against an overconfidence in the success of his namesake, but, alas! he wouldn't be warned in time.—Ed.

TRADE NOTES.

Messrs. J. C. Steele & Sons, manufacturers of the "NEW SOUTH" Brick Machines and Appliances, Statesville, N. C., are making an addition to their machine shops, 40x125 feet, of brick and two stories high.

A number of new and improved machine tools have been added to their shops, better equipping them in every way for the manufacture of brick mills.

These gentlemen report a most successful business during the year 1900 and are making preparations for a more extensive business for the year 1901.

Mention THE CLAY-WORKER.
WHEN WRITING TO ADVERTISERS
Mention THE CLAY-WORKER.

TABLE OF CONTENTS.

Brick Construction..... 347
The Spectre of the Sand Brick. 348
Philadelphia Brick, Terra Cotta 349
Fire Brick, Their Manufacture and Uses.....350
Some Curious Old Water Coolers Made in America..... 352
Watch That Burner..... 353
Brick Paving in Des Moines.. 354
The Trusts and The Small Brick Factories..... 357
William H. Hunt..... 357
Hoosier Clay Metropolis..... 358
The Kaolins and Fire Clays in Europe..... 361
Southern California Brickmaking and Brickmakers.... 362
Prosperity in Georgia. 365
Note on The Use of Producer Gas in Burning Bricks..... 366
Official Announcement..... 369
By the Light of the Kiln Fire.. 370
A Cause of Variation in the Firing of Kilns and a Remedy for the Same..... 371
Generator Gas as a Source of Power on Brickyards..... 373
Grath's Improved Up-Draft Kiln..... 373
Treatment of Tenacious Clays. 374
Up-To-Date..... 375
Making Bricks From Glass Works Refuse in England.... 375
Personal Mention..... 379
Brick of Sand..... 392

CORRESPONDENCE.

Capital Brick and Building News..... 364
Notes From Tide Water, Va.... 369
Brick and Tile Business in Iowa 376
The Chicago Brick and Building Situation..... 376
In and About Pittsburg..... 376
From The Kentucky Metropolis 377
Pacific Coast News..... 377
Arkansas Brick Bats..... 378
Down in Jersey..... 378
The New York Brick Market.. 388
Buffalo Brick News..... 390

EDITORIAL:

Current Comment..... 380
The Next National Convention 380
The Clayworkers Thanksgiving..... 380
Brick Pavements..... 381
Commercial Clubs..... 381
General Prosperity..... 381
Trade Literature..... 381
Trade Notes..... 382
Editorial Notes and Clippings. 384

MISCELLANY:

Keeping It Alive..... 352
What's the Matter With Kansas..... 353
The Cause of Labor Troubles.. 361
The Evil Side of Sensationalism..... 365
The "Brick Dog" Dead..... 368
Increase of Wealth; Its Cause.. 379
Why Thankful?..... 382
Causes for Thankfulness..... 382
Hail To The Prophet of the Wabash..... 382
The Appetite of a Tramp..... 390

Index to Advertisements on Front Inside Cover Page.

THE CLOSEST INVESTIGATION.

The fact that so many concerns have sent us repeat orders is the best evidence that after the closest investigation

THE CROSS OIL FILTER

Is the most economical, most satisfactory filter. It saves half your oil bills. Can't we send you one on approval at our expense.

The Burt Manufacturing Co.,
Akron, Ohio, U. S. A.

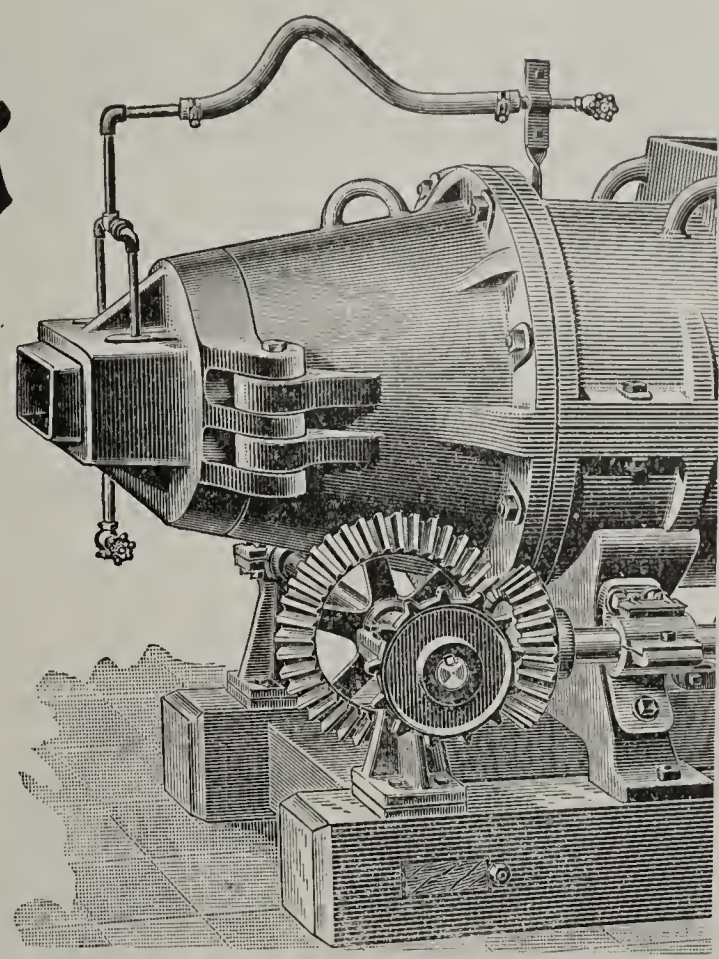
Largest manufacturers of Oil Filters in the World.

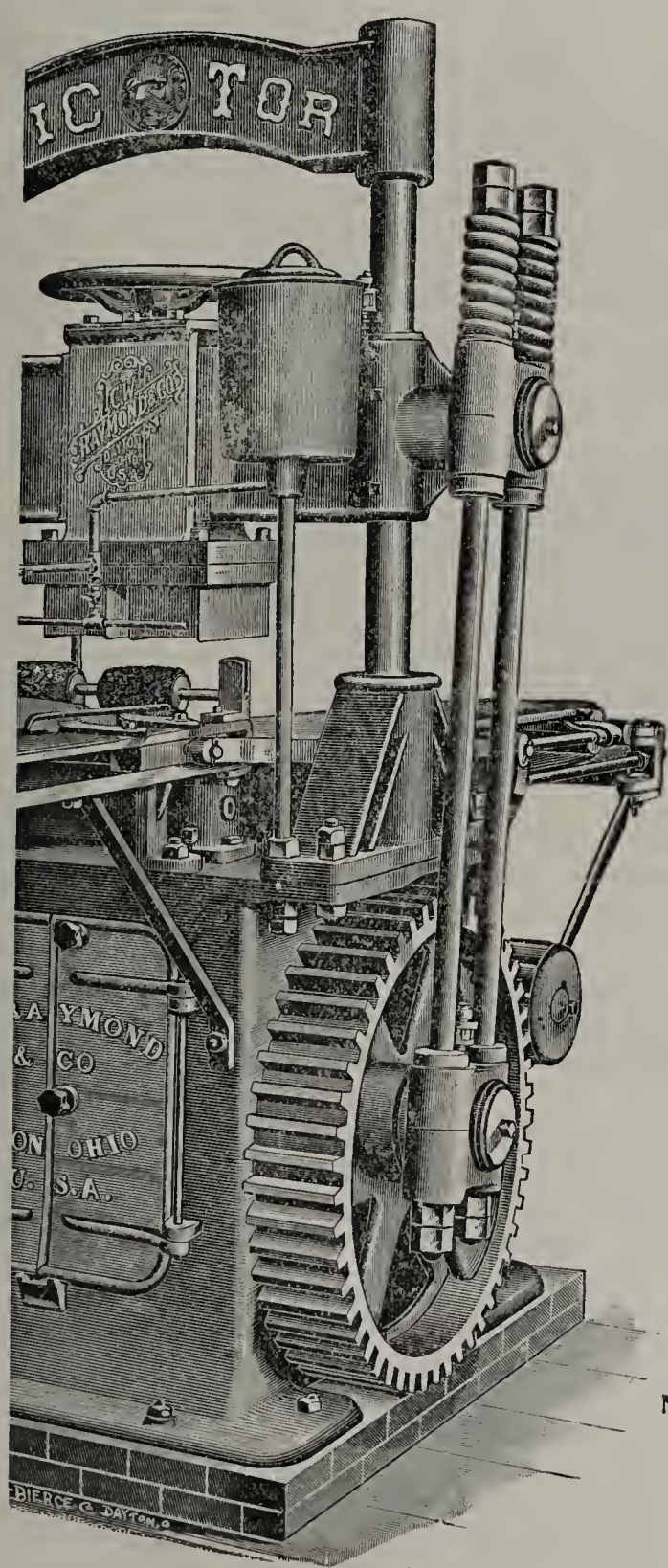
We also manufacture the BURT EXHAUST HEAD.

Better Brick

ARE PRODUCED BY RAYMOND
RELIABLE BRICK MACHINERY

than by any other. The Machine is not only reliable, but it makes a reliable quantity and quality of brick. Therefore, when we say reliable, we mean it.





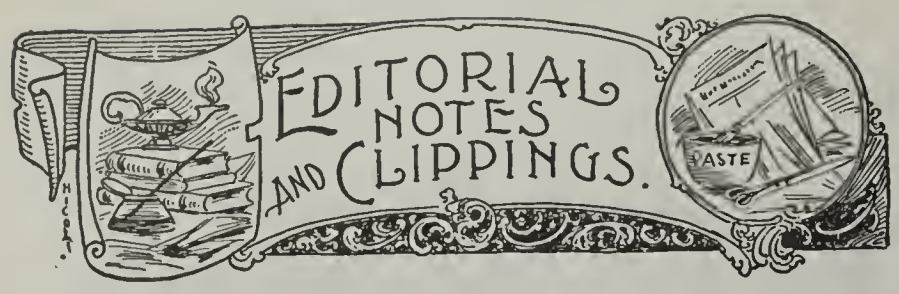
What's the Use of Argument?

You can't beat a Raymond Re-Press. Not only the oldest in the market, but the simplest and best. Absolutely no repairs in years. Over 400 Raymond Re-Presses in daily use.

The C. W. Raymond Co.

DAYTON, OHIO.

NEW YORK OFFICE,
Room 40, 39 and 41 Cortland Street.
PITTSBURGH OFFICE,
1519 Park Building.



A new brickyard is to be opened at El Capitan, N. Mex.

J. B. Raine is erecting a large drain tile plant at Santa Ana, Cal.

J. G. Weir & Son, Liberty avenue, Pittsburg, will start a new brick plant in O'Hara township.

D. C. Barringer, a brick manufacturer of Newark, N. J., died at his home in that city November 12.

William Schmohl, of Rockford, Ill., advises us that he is in the market for a first-class tile machine.

H. C. Morrow is considering the feasibility of adding a big pottery plant to his sewer pipe works at Whitehall, Ill.

Hartley, Ia., is to have a new brickyard. Mr. Hurley, of the Hartley State Bank, is the prime mover in the affair.

The United States Clay Co., Pittsburg, Pa., contemplate the erection of an immense clayworking plant at Lisbon, O.

Mr. Charles Sheppler has purchased the interest of Mr. Kindig in the brickmaking plant of Sheppler & Kindig, at Cando, N. Y.

Bingham Lake Brick and Tile Co., Windom. Minn., are making preparations to double the capacity of their plant for next season.

The works of the V. V. V. Brick Co., at Neodesha, Kan., was damaged to the extent of $275 by a fire, which orginated in the dry house.

The Suffolk (Va.) Clay Co. have recently closed a contract with the government to furnish 1,000,000 brick for the Portsmouth navy yard.

Jones & Dyas Brick Co., Huntsville, Ala., have just made some additions to their plant that will enable them to run full handed all winter.

George H. Parker, of Des Moines, Iowa, writes that he is investigating the clayworking field with a view of going into the brick business.

A fine deposit of clay has been found at Arcadia, Fla., and it is probable that a brick plant will be established. Dr. C. H. Smith is interested.

The firm of Fries & Correy, of Milton, Pa., brick manufacturers, has been dissolved. John M. Correy retires, while W. E. Fries will continue the business.

William Corson, an employe at the Eisenhart Brick Works, at Horseheads, N. Y., was caught in a fall of clay at the clay bank and instantly killed, October 24.

The plant of the American Clayworking Machinery Co.'s plant, at Willoughby, O., was slightly damaged by fire October 27. The cause of the fire is unknown.

The brick plant of the T. Haumerson Co., at Racine, Wis., was destroyed by fire the 2nd inst. The loss is estimated at $2,500, on which there is no insurance.

A. J. Miller writes that he will erect and operate a brick plant at Washington, La., and would like to correspond with manufacturers of brick machinery and supplies.

A. J. Ward and W. A. Garner have secured a location on Detroit street, Flint, Mich., for their new brickyard. They will not be ready to make brick before next spring.

The Boulevard Brick Co., Fourth avenue, Pittsburg, Pa., are getting their new plant in working order as rapidly as possible. They are putting in a Barron brick dryer.

Lloyd Crowl, night watchman at the Minerva (Ohio) Brick Co.'s plant, met a most painful death recently. He was in front of one of the boilers when one of the flues blew out, and the escaping steam and water burned him so badly that he died a few hours later.

The Brick and Tile Manufacturing Co. has been chartered to manufacture brick and tile at Newbern, Va. T. G. Hyam is the principal stockholder. The capital stock is $50,000.

Damage to the extent of $700 was caused by fire at the clayworking plant of Milton Edgar, at South River, N. J., November 12. The loss was almost entirely covered by insurance.

Frank Williams, general manager of the Basic Brick Co., and one of the foremost young business men of Johnstown, Pa., died at his home in that city October 18 of pulmonary trouble.

George L. Taylor and D. B. St. Clair will start a new brickmaking plant at Palmer, Fla. They have a deposit of clay which they claim is the superior of any heretofore found in Florida.

The Gunness Brick Co. is the name of a new concern at Duluth, Minn. The company is capitalized at $50,000 and is incorporated by J. T. Gunness, A. Howell and William Elder, all of Duluth.

The brick plant of John Sherborn, at Wayne, Neb., was damaged to the extent of $3,000 by fire recently. The fire is supposed to have been the work of incendiaries. Mr. Sherborn carried no insurance.

The American Tin Plate Co., of Chicago, Ill., have repeatedly duplicated their orders for Cross Oil Filters, and are now using 19 filters in their plant. This speaks well for the popularity of the Cross.

The Collins Brick Works, manufacturers of building and paving brick, Atlanta, Ga., are going to put in a new dryer, and will be pleased to have builders of dryers send them descriptive matter and quote prices, etc.

The Simpson Manufacturing Co., Winthrop Harbor, Ill., has recently booked an order for a brick machine to go to Mexico. The same parties expect to put in another press brick outfit next spring of the same make.

In renewing his subscription, W. A. Carl, manager of the Grenada (Miss.) Brick Co., writes that his company will be in the market for a brick machine, clay car and hoisting drum this winter, so as to be ready for spring trade.

The officers of the American Encaustic Tiling Co. have been notified that the firm has secured the only gold medal awarded by the management of the Paris Exposition to American tile manufacturers. Naturally they are much elated.

J. F. Yegge and Axel Nystrom have purchased the Barnes tile factory, at Boone, Iowa. They will not operate same this winter, but will make a number of improvements preparatory to operating the plant on an enlarged scale in the spring.

Geo. J. Fickes, the well-known brick manufacturers of Steubenville, O., has purchased a tract of land at Carnegie, Pa., on which he will erect a brick plant. A company will be organized to operate same and will be known as the Rosslyn Brick Co.

A new brickyard is to be opened at Mass City, Mich., by J. W. Black and V. A. H. Robinson, of Chicago. They expect to erect the plant during the winter months and be ready for operation the first of May. The plant will have a capacity of 40,000 brick a day.

Mr. Charles Sheppard, who for forty-five years carried on a large brick manufacturing business at Montreal, Canada, died at his home in that city. He retired from active business three years ago on account of failing health, since which time the business has been conducted by his sons.

The Wardenclyffe Brick and Tile Co., of Brookhaven, Suffolk county, N. Y., has filed a certificate with the Secretary of State, setting forth that it has increased its capital stock from $2,000

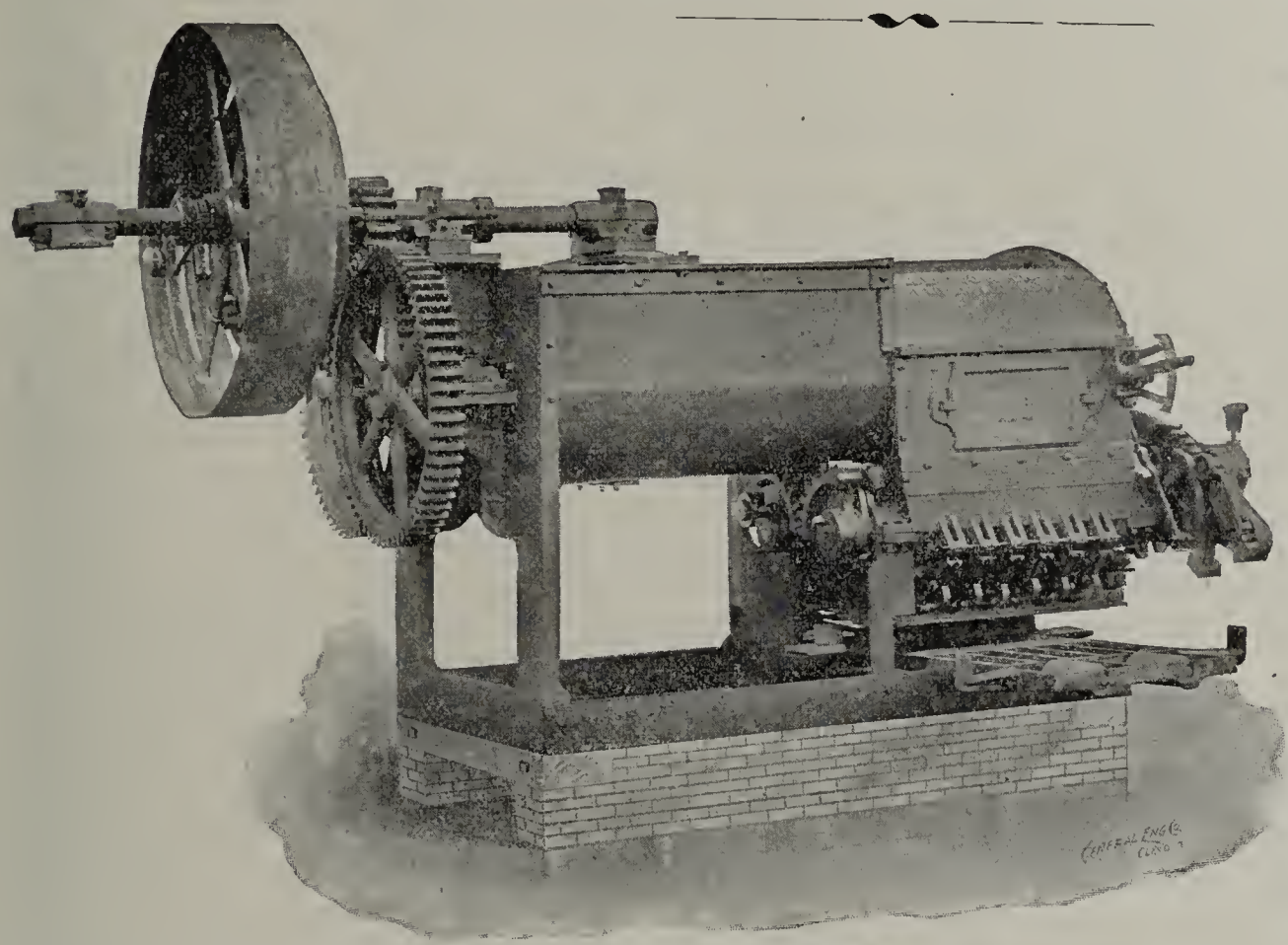
[CONTINUED ON PAGE 386.]

LIGHT HOUSES

Do not have to hire bands or fire cannon to call attention to their shining—**THEY JUST SHINE.**

Thus it is with the two "soft-mud" machines we manufacture (one horizontal and one upright). **Each** is at the head of its respective class, and the number of each in use, (note the figures)

TELLS THE WHOLE STORY.



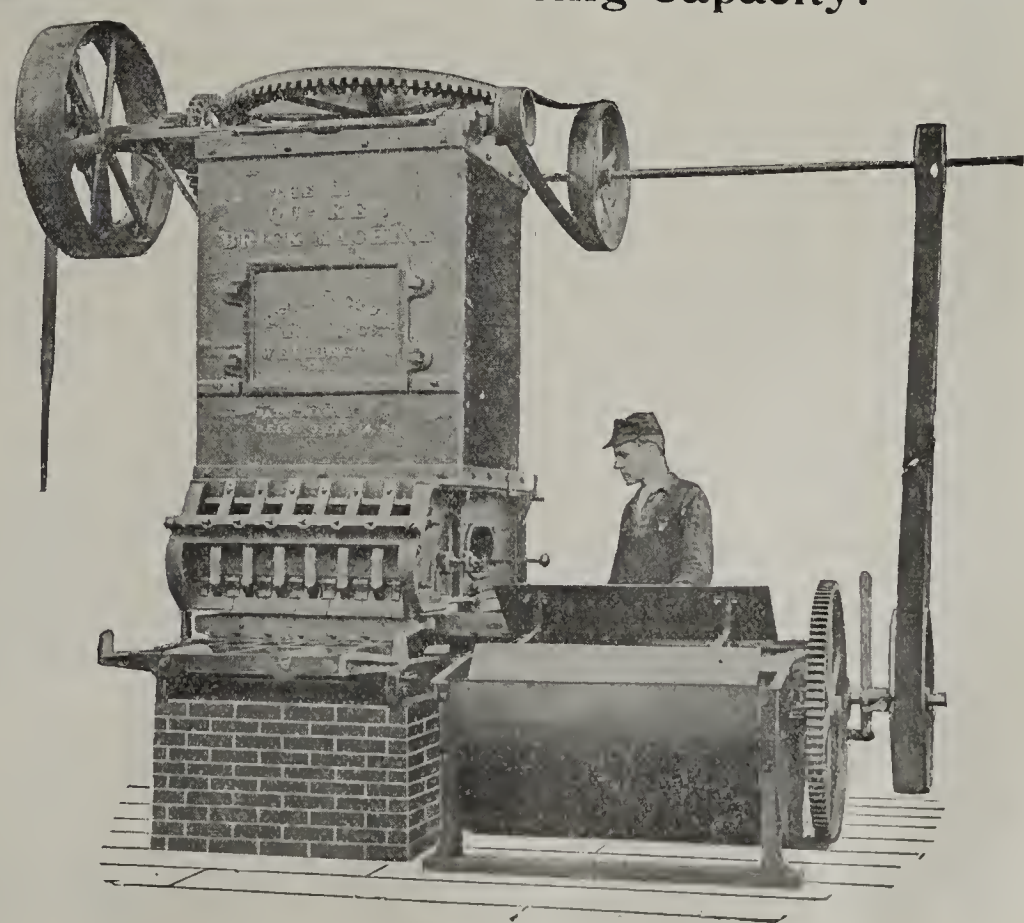
Over 100 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

Our mould-sander is the best, simplest and cheapest.

With our Roller-bearing Brick Barrows you can wheel 20 per cent. more load and do it as easily. Order one subject to approval.



ALL OTHER SUPPLIES. Send for Catalogue.

The Wellington Machine Co.,
WELLINGTON, OHIO.

EDITORIAL NOTES AND CLIPPINGS—Continued.

to $100,000, consisting of 1,000 shares of $100 each. The amount of capital actually paid in is $500. The company has no debts or liabilities. Its directors include William F. McNamara, Maurice P. Davidson and Charles Kirwin.

The brick firm of Bolton & Moore, of Mandeville, S. C., has dissolved by mutual consent, and Mr. Moore will continue the present business and Mr. Bolton has leased the premises on the opposite side of the railroad and will establish a first-class brick plant with a capacity of 50,000 brick per day.

The C. Pardee Brick Works, at Perth Amboy, N. J., has been sold to H. E. Linaweaver for $315,000. The latter gentleman represents a corporation that will operate the clayworking plant in manufacturing art tile as heretofore. Mr. Pardee will turn his attention to the manufacture of iron and steel.

Williams & Burchinal, brick manufacturers of Uniontown, Pa., have recently made a number of improvements in their plant and have put in a brick machine of 40,000 daily capacity from the shops of the Horton Manufacturing Co., Painesville, O., that will enable them to double their present capacity.

The Fernholtz Brick Machinery Co., St. Louis, Mo., recently forwarded a pulverizer and a lot of brickyard supplies to Francisco L. Cantu, of Monterey, Mex. Mr. Cantu seems well pleased with the Fernholtz machinery, as he purchased a four-mold Fernholtz press and a pulverizer about a year ago.

The Streator Clay Manufacturing Co. are considering the propriety of doubling their plant at Sreator, Ill. The business of the establishment has been gradually increasing during the past three years, necessitating this departure on the part of the firm to enable them to fill their rapidly increasing orders.

The Jennings Brick Manufacturing and Contracting Co., Ltd., is the name of a new concern incorporated at Jennings, La. They have purchased the old Jennings brick plant and will make a number of improvements. The incorporators are D. C. Brown, president and manager; J. L. Shultz, secretary and treasurer.

In a recent letter, W. J. Carter & Son, Paris, Tex., advise us that, owing to the death of Mr. James Rollins, the firm of Carter & Rollins has been changed to W. J. Carter & Son. They say: "We receive our Clay-Worker regularly and beg to compliment you on same, as we think it is the best magazine of its kind offered to the public.

Ground has been broken for the new plant of the Western Brick Co.'s plant, at Danville, Ill., and the works will be pushed to completion as rapidly as possible. F. W. Butterworth, the general manager, is giving all his time to superintending the laying out of the plant, construction of buildings, so it is needless to say this work will be well done.

Asbjom Sonthagen, Nordstrand, Norway, in a recent communication, says he is desirous of investigating the advantages of hollow block, as compared with brick, and would be pleased to correspond with manufacturers of hollow brick. Mr. Sonthagen says he thinks The Clay-Worker the best and most valuable paper of the kind he has ever seen.

The bargains offered by the Miller Oil and Supply Co., Indianapolis, Ind., are attracting much attention. Their strict integrity and conscientiousness in furnishing just what they advertise is to be recommended, and naturally results in their holding a customer once he has tried their belting, saws, oils, etc. Their advertisement appears on another page.

The Climax (Pa.) Fire Clay Co. has been chartered. The members of the company are Henry Y. Haws and John M. Rose, of Climax; W. G. Bell and John M. Christy, of New Bethlehem, Clarion county, and Charles H. Luke, of Pittsburg, Pa. The capital of the company is $100,000, all of which is fully paid. The works are operated at present by H. Y. Haws and W. G. Bell. For many years previous to the formation of the partnership now existing between Mr. Hawes and Mr. Bell the works were successfully operated by Mr. Bell. The plant is now running to its full capacity.

Capt. L. D. Morris, secretary and treasurer of the Collins Brick Co., of Atlanta, Ga., was perhaps fatally injured by a wreck on an electric car line. He was going into the city from the brick works, when one of the car wheels broke and burst through the car, striking him in the abdomen. Mr. J. T. Collins, president of the company, was also on the car, but he escaped with a slight injury.

The dryer at the brick plant of D. G. Loomis & Sons, at Ascot, near Sherbrooke, Quebec, was destroyed by fire early the morning of the 31st of October. Owing to the fact that the wind was blowing from the right direction they were able to keep the flames confined to the dryer and to save the rest of the plant. About 100,000 green brick were ruined, in addition to the loss of the dryer. They will at once build a new dryer.

S. A. Robertson, who was formerly at the head of the Des Moines Brick and Manufacturing Co.'s works, Des Moines, Ia., which was destroyed by fire some two years ago, has announced his intention of organizing a new company, putting up an extensive building and paving brick plant at Des Moines in the spring. Mr. Robertson's connection with the enterprise is a guarantee of its success, for he is a practical brick man.

Early Tuesday morning, October 23, fire broke out in the dryer of Sankey Bros.' brick plant, Pittsburg, Pa., causing a loss of $1,500. As it was a hot air dryer, they are at loss to account for the fire. Mr. A. F. Barron, the builder of the dryer, who was fortunately in the city, superintending the erection of an Iron-Clad dryer at the Boulevard brick plant, immediately took up the work of repairing the dryer, and on Saturday of the same week had the dryer all ready for operation, a record of which Mr. Barron may well be proud.

Once more the daily press is chronicling the purchases of the New England Brick Co. Among late purchases are brickyards at Cambridge, Belmont, Concord and Medford, all Massachusetts towns, for which $348,000 were paid, and in addition the plant of the Best Brick Co., at Mechanicsville, N. Y. The local papers say: "The New England Co. is buying up practically all the yards in the New England States, by which it will be able to control the entire output of bricks from the Hudson river to the New Brunswick border. The total area of these plants is between 4,000 and 5,000 acres."

George Furniss, of L'Original, Ontario, Canada, writes that he has fine deposits of shale in close proximity to a splendid clay bank, and that by the admixture of the two a very excellent brick can be made, suitable for both paving and building purpose. The village of L'Original will vote a bonus of $10,000 if a company is organized to work the clay, and Mr. Furniss is trying to organize such a company. He has had the clay tested and is now operating on a small scale, but is desirous of branching out, and would be pleased to correspond with parties desiring to investigate the possibilities of such a venture.

A RECORD HARD TO BEAT.

Robert Twells, superintendent of the Buckeye Brick Co.'s works, at Wickcliffe, Ohio, writes that the plant there has been running two years and seven months without a shutdown, and that there is a fair prospect of a continuance of this happy condition. This is a remarkable record. If any brickmaking plant in the country can equal it, we would be glad to hear from them.

GOLD MEDAL FOR CLAY EXHIBIT.

Prof. Binns, director of the New York State School of Ceramics, at Alfred, N. Y., has been awarded a silver medal at the Paris Exposition for his collection of the economic clays of the United States. The exhibit will probably form part of the mining section at the Pan-American next year.

How Much Could You SAVE

BY USING A

Crown Dryer.

THE WARREN BRICK AND TILE COMPANY.

MANUFACTURERS OF

BUILDING BRICK AND DRAIN TILE.

WARREN, OHIO, November 7, 1900.

THE CROWN DRYER CO., Cleveland, Ohio.

GENTLEMEN: On September 12th we made a test for fuel consumption on the Dryer which you installed for us, showing the following results:

Fifty cars dried—448 Brick per car—22,400 Brick.

Green Brick weigh 8 lbs., Dry 6½ lbs.—1½ lbs. Water per Brick—33,600 lbs.

		Water.
Amount	Coal for 24 hours	1880 lbs.
"	Ash for 24 "	357 "
"	Combustible for 24 hours	1523 "
"	Water per pound Combustible	22.06 "
"	Water per " Coal	17.87 "
"	Combustible per Brick	68 "
"	Coal per Brick	84 "
Cost of	Coal per ton	$2.00
"	" " Thousand Brick	8.4 cents.

We enclose check in final payment for Dryer, and cheerfully recommend it as being, in our opinion, the best and most economical on the market.

We shall be pleased at any time to show it to interested parties and afford them every opportunity for investigation.

Yours very truly,

THE WARREN BRICK & TILE CO.

E. C. WOLCOTT, MGR.

The CROWN DRYER is not only the **Most Economical** on the market, but is **Reliable, Simple, Durable,** has nothing to get out of order or need repairs, is under the **Positive** and **Absolute Control** of the operator in all respects and is comparatively inexpensive to construct.

Write for information.

The CROWN DRYER CO.,

New England Building.
CLEVELAND, OHIO.

Written for THE CLAY-WORKER.

THE NEW YORK BRICK MARKET.

THE CAUSE of depression in the real estate trade is solved to the satisfaction of one of the New York daily papers. The blame is laid at the door of the structural iron men. The paper referred to gives the figures of projected buildings for the three and six months of 1889 and the present year, and says that the decrease was specially noticeable when the prices of iron were highest. The fall in the price of iron was followed by an increase, but they do not say of what, but I presume they mean an increase in the number of buildings projected. The second reduction in the price of structural iron was caused by another increase. It is said the manufacturers are now busy filling orders which have come in since the prices were restored to a normal figure.

The experience of other manufacturers has doubtless shown them how unwise their former policy was, and it is not likely that they will again try to take advantage of the builders. No doubt the writer of the article in question thought he had reached the bottom of the matter by making a visit to the department of building and getting the value of the projected buildings. It is probable he asked the superintendent as to his opinion of the cause, and to save further questioning the superintendent probably answered, "The high price of structural steel."

—What Is the Cause?—

The answers to that question are as varied as the number of men with whom one may talk in regard to the question. The stubborn fact confronts them that the demand is far below what it was last year, and that it came on unexpectedly, and still remains. As a matter of fact, the price of structural steel, be it high or low, does not affect the erection of buildings. If the buildings in which structural steel is used in their construction were all that the brick, cement and lime men had to depend on, a great many brickyards would be closed up. Dwelling houses do not require it, except when the call is for fireproof structure, and then it is only the beams and rafters. One would think that a reporter would investigate a matter thoroughly before giving publicity to his opinion in regard to same. In my opinion the solution of the question is as far off as ever. So far the increase in the number of new buildings spoken of in the aforesaid article has not materialized. On the contrary, there is a falling off in the number of permits issued.

The activity in real estate that is reported as a fact is, in most cases, simply a transfer of houses, or what is known as improved property, and not the sale of lots on which buildings requiring a great many brick will be erected. As is usual during a presidential year, most of the manufacturers think campaign year is, to a great extent, the cause of the depression, and they are, perhaps, right. The present state of trade may be used as a good argument in favor of going back to the use of sail vessels for the transporting of brick to the market in place of the barges now in use. In the use of the sailing vessels so many brick could not be shipped at one time, but that day is past. During the past season, in most cases, neither sail boat nor barge has earned enough to pay for the paint that is required to keep them in proper condition. One of the manufacturers in this season has had his vessel lying alongside the dock all summer because the prices were not such as to justify him in shipping to market, and the indications are now that the vessel will not go to market this season. A number of the yards have not sent their vessels out since the latter part of June, except when the brick were to go to some other point than the New York market.

—A Strange Explanation—

Has been offered for the depression in the brick trade by a Trenton brick manufacturer. The demand for the once famous and popular Trenton has declined very largely in the past few years, partly, the gentleman says, on account of the dullness in the building trade, particularly in the erection of residents. And this, he adds, is due to the increasing number of people who are giving up housekeeping and living in hotels and private boarding houses, driven there by the intolerable and vexatious servant girl question. It has been so difficult to secure satisfactory help at reasonable prices that people prefer boarding to keeping house.

The production of brick has gone on just the same in the face of the falling market, and when the season closes it will be found that the usual number of brick has been produced, and that the sheds may hold a few more arches than have been shown the past season.

—The Weather—

The past month has been something remarkable, and the use of brick could go on almost steadily, as rain has been very scarce, and cold, raw days unknown. If the demand called for them there would be nothing to prevent laying them. The shipping season will close now in about six weeks, and possibly in less time, as we certainly cannot expect the favorable weather to last beyond the middle of December. All yards far removed from the market—that is, on the upper Hudson, will try to market all they can, and the lower Hudson yards may be able to ship a week or so later. Still the cold weather may settle down before then, with plenty of snow for those who may require a snowball diet.

—The Market.—

One month ago the market had made a slight advance, and it seemed to be the impression that the good work would go on. The 1st of November is at hand, however, and the $5 price has not been reached except in a special grade from Newburg Bay. It has taken a month to raise prices just a little, so it does not look to me as though the $5 price would be general.

The last week of the month three barges of brick were left over from the week before. Sixty-seven barges arrived that week, and sixty-three were sold, leaving seven barges on the market October 25. Prices range as follows:

Haverstraws, $4.50 at $4.87½.
Newburg Bay, $4.50 at $5.00, special.
Up Rivers, $4.50 at $4.75.
Hackensack, none in the market.
Pale, $1.50 at $1.75.
Let the good work go on.

A. N. OLDTIMER.

Hackensack, N. J., November 1.

A Bit of Thanksgiving Day Scenery.

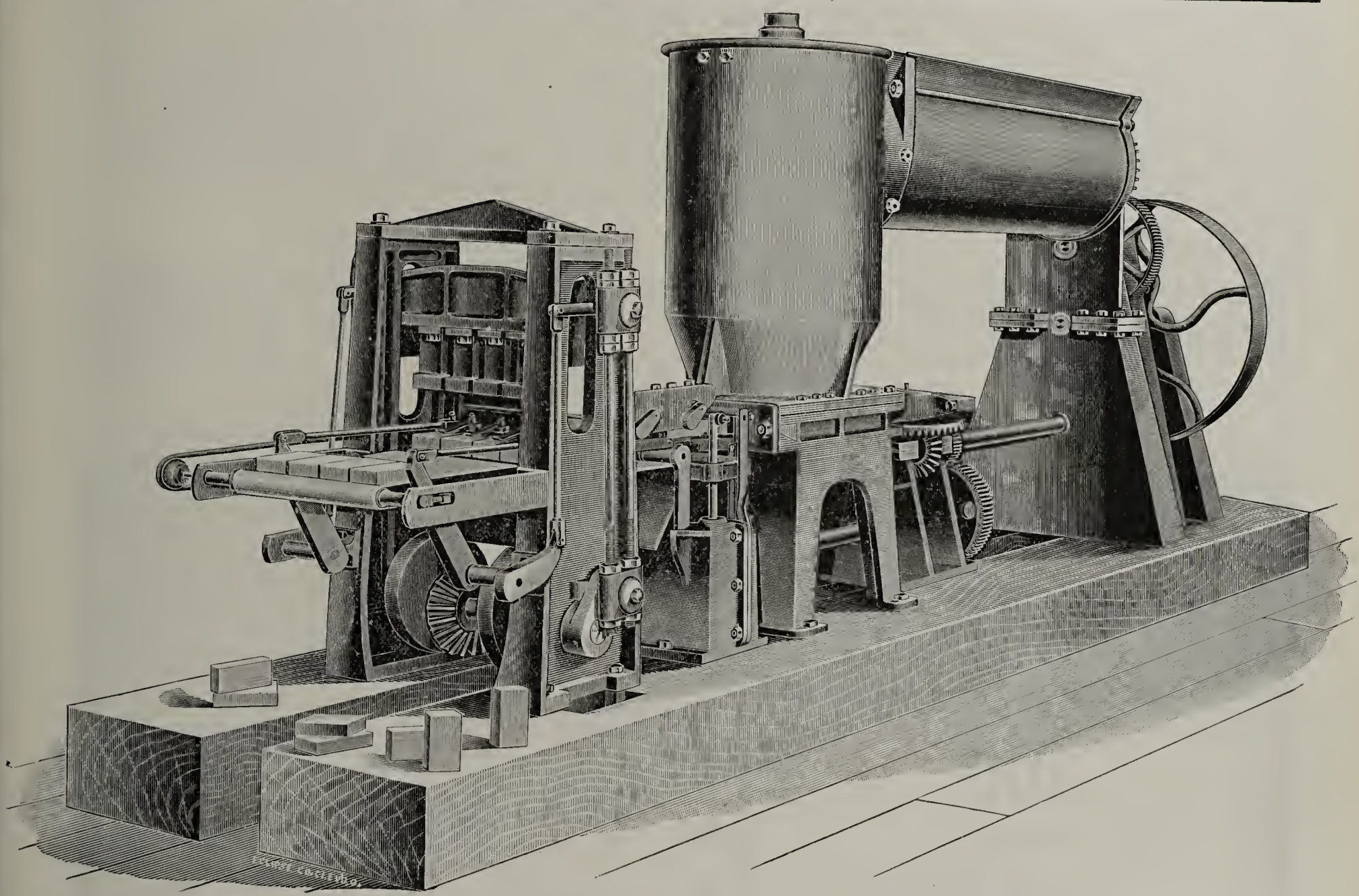
A Perfect Brick Machine.

STRONG, POWERFUL, SIMPLE and POSITIVE.

Absolutely Unbreakable. **Less Working Parts than any other Machine.**
Without Repressing Attachment.

The DICTATOR BRICK MACHINE will take the Clay or Shale as it comes from the bank or Dry Pan and automatically produce perfect repressed brick.

NO LAMINATION.



DICTATOR BRICK MACHINE. Capacity 40,000 Perfect Repressed Brick per day.

The only machine in the World, that will Automatically produce perfect Repressed Brick.

The Battenfeld Mfg. Co.,

Write for Catalogue. *922 Garfield Bldg, CLEVELAND, OHIO.*

BUFFALO BRICK NEWS.

Politics must have slightly affected the market during October, as the deliveries were not quite up to the average. Beautiful weather was the rule during the month, still most of the yards shut down before the 10th, not daring to take the chances of a frost. There is still some brick to be burnt. The average output was about the same as in 1899. One of the benefits of an association comes in here—the yards are not obliged to carry large stocks. As combined, they are prepared to fill any order that comes along. On the 21st of last month I was in Cleveland, and in talking with a prominent builder he told me business was good, in fact, brick were hard to be got. They had a contract to build a transfer house and an addition to the power house for the street car company, wnich would take about one million brick, and had to be finished in sixty days. It was hard work to obtain brick fast enough to complete the job in the required time. On my voyage home on the magnificent and fast steamboat, City of Erie, while enjoying tne early morning sun and grand scenery, the shores of Canada on one side and Cattaragus hills on the other, and just before coming into Buffalo harbor, who should hail me but our old friend, E. E. Gorton. He is now with W. D. Richardson, and reports business very good. He also told me of a firm in the sewer pipe line who were unable to fill the demand for their goods—more evidence of prosperity in this great land of ours.

The Lancaster Brick Company intend spending about $10,000 for improvements during 1901. A new engine, new machine, continuous kiln, all under one roof, and in shape to make the various clay products of drain tile, hollow brick, etc.; also perforated radial bricks for round factory chimneys (European system), said to be unequaled for stability, good weathering qualities and general appearance. They are now erecting a round stack one hundred and fifty feet high out of radial bricks made by them. I visited the Pan-American grounds one bright morning last month, and saw them making bricks for the adobe huts, to be used in the streets of Mexico. They had dug three round soak pits, about six feet in diameter and eighteen inches deep. The clay was some they had got where they were digging a sewer about sixteen feet deep. It was ordinary red clay, had been pulverized or broken with a spade fairly well, then shoveled into the soak pits, wet down and excelsior or wood shavings, such as is used in packing, was sprinkled all over and mixed in the pit. The excelsior is to take the place of the wiry grass used in Mexico. The two hand molders, one white and one from Mexico, with two helpers, worked up about one pit every day. The brick were 8x12x4. They were spread out on boards to dry, and after drying piled up against the building under a temporary shed. It takes from four to six hundred for each hut, and they are to have eight in all. They informed me the brick in Mexico were generally larger, about 18 inches long, and they cited some buildings that were built of sun dried adobe brick over two hundred years ago. I doubt very much the brick I saw made lasting one season when exposed to the rains and climate here.

The main buildings at the Pan-American are nearly all finished, roofed over, sash in and glazing done. White staff is on and the man with the brush is hard at work painting and putting on the different tints in oil colors, something new and looks grand. The Manufacturers and Liberal Arts Building, Machinery Hall, and now the south towers of the electricity building are being touched up under the direction of C. Y. Turner, director of color. Some 5,000 men are at work on the grounds, and while this fine weather lasts work is being pushed along as fast as possible. The Howard electrical steel tower is up nearly 300 feet, and is to go 75 feet higher. A large force of men are hard at work to get it finished before winter sets in. William Tobin, who has just returned from Paris, says the work of construction is further advanced now than any other exposition of recent years. He predicts the success of the Pan-American, and that the midway will outdo both Paris and Chicago. Yours, NORTON.

Buffalo, N. Y., November 10, 1900.

THE APPETITE OF A TRAMP

Given in exchange for "that tired feeling" at West Baden and French Lick Springs, on the Monon Route. No extra charge. The sulphur and lithia waters are nature's cure, and are efficacious in (pretty nearly) all the ills that flesh is heir to, while the pure air and beautiful scenery will minister to a mind diseased. Quiet and inexpensive. Two trains daily from Dearborn Station, Chicago. Send for descriptive pamphlet. City ticket office, Monon Route, 232 Clark street.

Chesapeake and Ohio Railway

H.W. FULLER, G. P. A., Washington, D. C.
C. B. RYAN, A. G. P. A., Cincinnati, O.

Only Direct Line to

Old Point Comfort, Virginia,

Through the most Picturesque and Historic Regions of America. Direct Line to Richmond. To New York via Washington, Baltimore and Philadelphia.

YOU Can Stop Ten Days each at Washington, Baltimore and Philadelphia on a first class ticket to New York via C. & O. Route.

JUST OUT.

ECOND EDITION OF

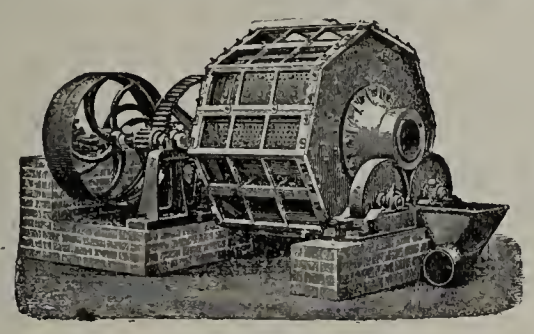
Tables of Analyses of Clays

By ALFRED CROSSLEY.

This valuable book has been carefully revised and enlarged to twice the size of the original edition. Among a large number of new analyses is included the leading PAVING BRICK CLAYS AND SHALES of America. For purposes of comparison this work is invaluable, and should find a place in the library of every clayworker. It is handsomely bound in Morocco and will be mailed postage prepaid to any address on receipt of price, $1.00.

T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The SMIDTH BALLMILL.



Simplest ✻ Best ✻ Most Efficient.

CRUSHES, GRINDS and SIFTS in one Operation, Working Continuously.
Excells all others in Absolute Uniformity of Product.
Maximum Output. Slight Cost of Repairs. Low Horse Power.
SEND FOR CATALOGS.

F. L. SMIDTH & CO., Engineers,
66 Maiden Lane, N. Y.

COPENHAGEN: Vestergade 29, K.

LONDON: 9 Bridge St., S. W.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.,

of St. Louis, Mo., U. S. A.

Williams's Shale and Clay Pulverizer, With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

For further information write to

SUBURBAN BRICK CO.

WHEELING, W. VA., June 18, 1900.

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO, St. Louis, Mo.

Gentlemen:—Answering your favor of the 12th inst. We are pleased to say that the Shale reducing machine, put in our factory at Martins' Ferry, Ohio, has done good work, and in sufficient quantity for our needs, and has been very satisfactory in practice.

We have had no repairs or expense upon the machine, except for a set of new knives, during the past year, and this fact alone, when compared with the cost of keeping a grinding pan of the same capacity in repair, ought to be all the encomium or recommendation your machine needs to commend it to practical people.

Very truly yours,
SUBURBAN BRICK CO.,
Per B. F. Hodgman, Sec'y.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO., 2701-2707 North Broadway, ST. LOUIS, MO., U. S. A.

Branch Offices: NEW YORK OFFICE: Singer Building. WEST VIRGINIA OFFICE: Bramwell. PHILADELPHIA OFFICE: Stephen Girard Bldg. LOUISVILLE OFFICE: 1301 West Main Street.

Office of T. W. CARMICHAEL,

Wellsburg, West Va., November 15, 1900.

Messrs Brickmaker, The World Over:

Gentlemen—The Carmichael Clay Screen has eight (8) screening surfaces, each having fifty (50) square feet of actual screening surface. making four hundred (400) square feet in all, and has a simple device for scattering the clay over this vast surface.

Write me stating what process you use and I will send you a sketch drawn to a large scale, showing the Carmichael Screen with your machinery. Compare 400 square feet with the actual screening surface of the screen you are now using or of any screen on the market.

The Carmichael Screen is a Gravity Screen accessible from the floor level. There is no shake, no jar, and no per ''cussing.'"

T. W. CARMICHAEL,
Wellsburg, West Va., U. S. A.

BRICK OF SAND.

For thousands of years men have been making brick out of clay, and pretty good brick, too. But recently a new kind has come in vogue. It is composed chiefly of quartz sand, bound together with a small amount of lime. In the process of manufacture the compound is subjected to the influence of steam at high pressure. When properly made this brick is said to be hard waterproof and able to resist the action of acids. A lack of uniformity in the quality has been noticed, however. "Limestone brick" which are made in cold, wet weather, seem to give less satisfaction than those produced under other meteorological conditions. But there is now promise that this difficulty will soon be obviated. A consular report from Germany announces that a Zurich chemist, William Schwartz, has found a way to get good results every time. The secret lies in controlling the amount of moisture admitted to the compound and maintaining the temperature within certain limits for a time. The former part of the process is managed in a vacum, so that no dampness can be imparted by the atmosphere. Herr Schwartz has invented a machine of his own to do the mixing. Much confidence is expressed in the substantial value of the innovation reported.—New York Tribune.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED—First-class Burner for Vitrified Paving Brick Plant.
11-1-d Address Dale, care Clayworker.

WANTED—Four-mold dry press; must be in good condition; state price. Address
11 1 d T. C. B., care of Clay-Worker.

FOR SALE—One 40,000 capacity clay pulverizer, cheap; in good condition. Address
11 tf 1 PULVERIZER, care Clay-Worker.

WANTED—To purchase 50 or 60 steel rack pallet cars; give price and description.
11 1 c P. O. 228, Youngstown, O.

WANTED—Position in enamel or glazed brick, terra cotta, etc., factory, or as burner; every proof of ability given; no experimenting. COPE,
11 1 c Care Clay-Worker.

FOR SALE—Four-mold dry press brick machine, elevator, pulverizer and screen. A No. 1 condition; cheap.
PRESS BRICK COMPANY,
11 1 cm Erie, Pa.

FOR SALE—A good brick plant in Nebraska, 115 miles west of Omaha. A good, live town with two railroads. Yard fully equipped with E. M. Freese machinery, crusher, winding drum and clay car. Capacity about 2,000,000 per season. Brick sell from $5.50 to $9.00 per thousand. Good reason given for selling.
1-1-c Address B. K. care Clay-Worker.

For Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan Bark, Cinders, Ores, Sawdust, Lime, Cement, etc. Also continuous Pan Conveyors.

Iowa Pipe and Tile Co., Des Moines, Iowa.
Borden & Selleck Co., Chicago:
Gentlemen—We have used the Harrison Conveyor for the past two years. It takes about ninety tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours truly, IOWA PIPE & TILE CO.

BORDEN & SELLECK CO., Mfrs. and Sole Agents, **48 & 50 Lake St., Chicago.**
Send for Illustrated Catalogue.

Evens & Howard Fire Brick and Sewer Pipe Company,
ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

LEVIATHAN "It's a Brick,"

....EITHER FOR....
Transmission or Conveying,

And why it is in such general use among CLAYWORKERS, is that it may be run with less tension than other belts, does not slip; may be subjected to the most excessive weather conditions without injury, and as a result,

Outlasts From Two to Five Rubber Belts.

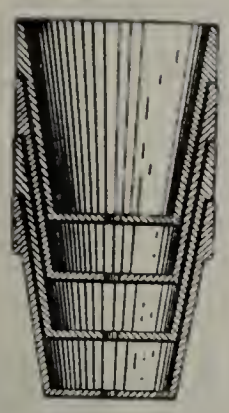
MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.
55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.
Write for Samples and Price List.

BOOKS FOR BRICKMAKERS,

"CLAY GLAZES AND ENAMELS," H. R. Griffen	$5.00
"BRICKMAKERS' MANUAL," Morrison and Reep	3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr.	2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley	1.00
"VITRIFIED PAVING BRICK" H. A. Wheeler, E. M.	1.00
"PRACTICAL FARM DRAINAGE,," J. J. W. Billingsley	1.00

Mailed, postage prepaid to any address on receipt of price.

T. A. RANDALL & CO.,
The Clay-Worker.
INDIANAPOLIS, IND.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,

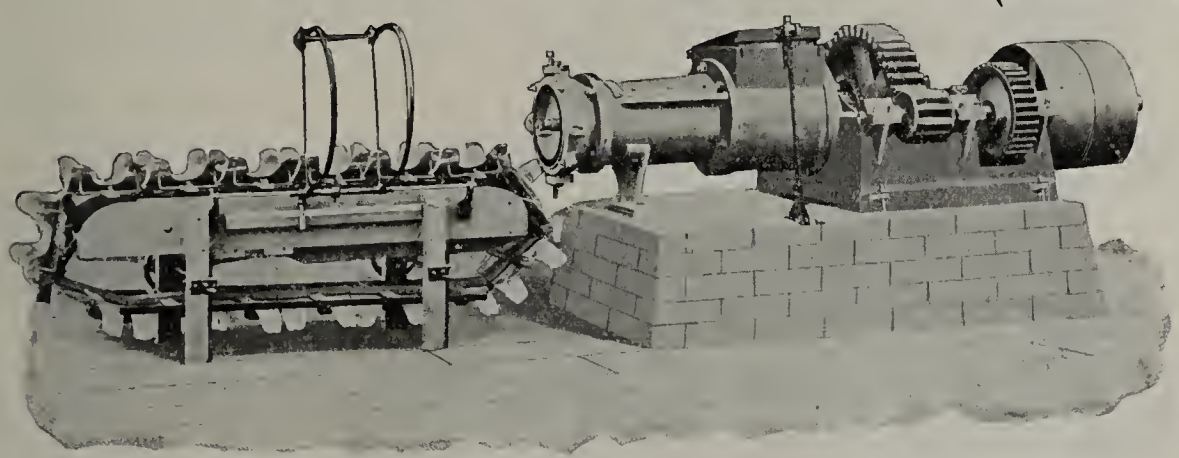
78 South Pennsylvania St., INDIANAPOLIS, IND.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of

Tile and Brick Machines.

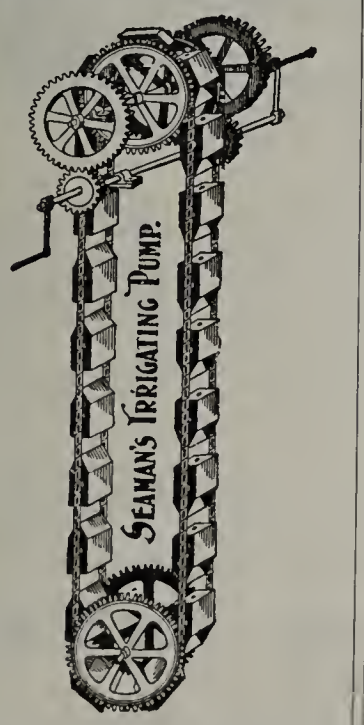


No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.



Conveyors

For Clayworking Industries.

WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.

Buhl Malleable Company,

Detroit, Mich., U. S. A.

FOR SALE—Ohio Tile Works. In good shape; good location, good trade; cheap. 10 3 c Address L., care Clay-Worker.

FOR SALE—No. 1 kiln brick and tile machine, side cut brick table, tile table and dies; all in perfect order; not adapted to my clay; price, $150. HOME,
11 1 c Care Clay-Worker.

WANTED—Position as superintendent or head burner of building brick plant; understands both the plastic and dry press process; best of references. NEBRASKA, care Clay-Worker. 11 1 c

MANAGER OR SUPERINTENDENT—Is open to re-engagement, to take charge of manufacture of fire brick, hollow building block and vitrified clay product; is experienced and reliable. Address
10 tf d LAND, care Clay-Worker.

"CORRESPONDENCE SOLICITED with Eastern or Western brickyard; manufacture new kind German perforated radial chimney bricks, for high chimneys."
LOUIS FORT, C. E.,
9 3 c 312 E. Thirteenth St., N. Y. city.

WANTED—In a fire brick works having a capacity of four (4) million brick, tile, etc., per year (working a dry press) and expecting to enlarge, a thoroughly experienced superintendent. A good salary to one who understands his business. Address
11 1 dm X. 17, care Clay-Worker.

WANTED—An opening for a modern dry press brick plant; parties having suitable clay for the manufacture of fine red pressed brick, buff brick or mottled brick, situated near a railroad or navigable stream, are requested to correspond with
A MANUFACTURER,
10 tf r Care Clay-Worker.

WANTED—To purchase, for cash, the machinery and equipment for a complete paving, building, dry press brick plant, with ground, building and power; give full particulars as to quality and quantity of sand on or nearby the premises; also the freight rates or cartage to the immediate cities for demand of the building materials. Address, with all other particulars,
11 3 d H. P. B. Co., care Clay-Worker.

FOR SALE—At Winslow, N. J., a tract of land, bordering on the West Jersey & Sea Shore and New Jersey Southern railroads and within one-eighth mile of the Atlantic City & Cape May railroad, containing about sixty acres of clay, suitable for making buff, colored and other ornamental bricks. For further particulars apply to GEORGE CORHEAN,
11 3 c 203 Walnut Place, Philadelphia, Pa.

UNUSUAL BARGAIN.
MODERN BRICK PLANT FOR SALE.

Located within one mile of court house, in growing city of 40,000; includes fifty-three acres land, three large up-draft kilns, two Eudaly down-draft kilns, one square and one round Simpson four-mold dry press machine and complete dry press outfit, two 75 horse-power steel boilers, one 75 horse-power engine, 1 Potts', all iron, latest design, soft mud machine, sander and disintegrator, large stack, clay shed and three small houses; old established business, extending over Illinois and Indiana. Will take $12,000 if sold this fall; cost over $30,000. Partners are old and wish to retire; will take some stock; will sell dry press outfit separately, if preferred. Address
11 1 d T. H., care Clay-Worker.

FOR SALE—Clay, buff or cream-colored when burned. Also red and white mottled clay. Address
NORTH END COAL CO.,
10 2 cm Canton, Ohio.

FOR SALE—One three-mold Andrus dry press; in good condition; would not be sold but for the fact we no longer make dry press brick; cheap for cash or on time to responsible parties.
COALDALE PAVING BRICK CO.,
9 tf r Birmingham, Ala.

WANTED—A situation as superintendent or foreman of terra cotta, tile or pressed brick plant. Understand all the details of making and burning porous terra cotta. Also the construction of kilns of all sorts. Satisfied with moderate salary if the situation is permanent. Best of references. Address
8 tf tr MILFORD, care Clay-Worker.

FOR SALE.

One 8 foot wet pan, wood frame.
Two 9-foot dry pans, wood frame.
One 9-foot dry pan, iron frame.
One stiff clay auger machine.
THE T. B. TOWNSEND BRICK & CONTRACTING CO.,
9 tf d Zanesville, O.

CONTINUOUS KILN PLANS.

TEN DOLLARS will buy blue prints and full specifications for building and operating the best and cheapest continuous kiln for common brick; capacity, 20,000 per day; cost, $2,000; open top; mechanical draft; will burn 90 per cent. hard brick and save its cost in fuel in two years. Write for particulars. WM. M. IRWIN,
2525 S. Fifteenth St., St. Joseph, Mo.

A GOOD MAN

Wants a situation as superintendent or general manager of a dry press brick plant. Understand thoroughly every detail of the business; expert in the manufacture of ornamental brick; also the production of flashed and mottled brick; good salary will be required and good service will be rendered; permanent, not temporary, situation wanted. Address, I. X. L.,
10 3 r Care Clay-Worker.

BARGAINS IN SECOND-HAND MACHINES.

One second-hand Simpson 4-mould brick press.
One 9x15 rock crusher.
One second-hand winding drum, with pulleys and cable complete.
One lot of contractors' dump cars and 25 horse-power engine and boiler, with all fixtures. Address,
HENRY MARTIN BRICK MACHINE MFG. CO., Lancaster, Pa.

BRICK MACHINERY FOR SALE.

One 6 mold Ross Keller Brick Machine, $2,500.
One 2 mold Whitaker Brick Machine, $800.
Also Disintegrators, Pulverizers,
Wheel Scrapers, Cars, Trucks, Pumps,
Boilers, Engines, Kiln Doors and Frames, Grates,
Steam Pumps, etc., in fact, the entire equipment of a large first-class brickyard.
Will sell the same in whole or in parts to suit.
For particulars and prices address
SCHOELLHORN-ALBRECHT MACHINE CO.,
8 tf d 420 N. Main St., St. Louis, Mo.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

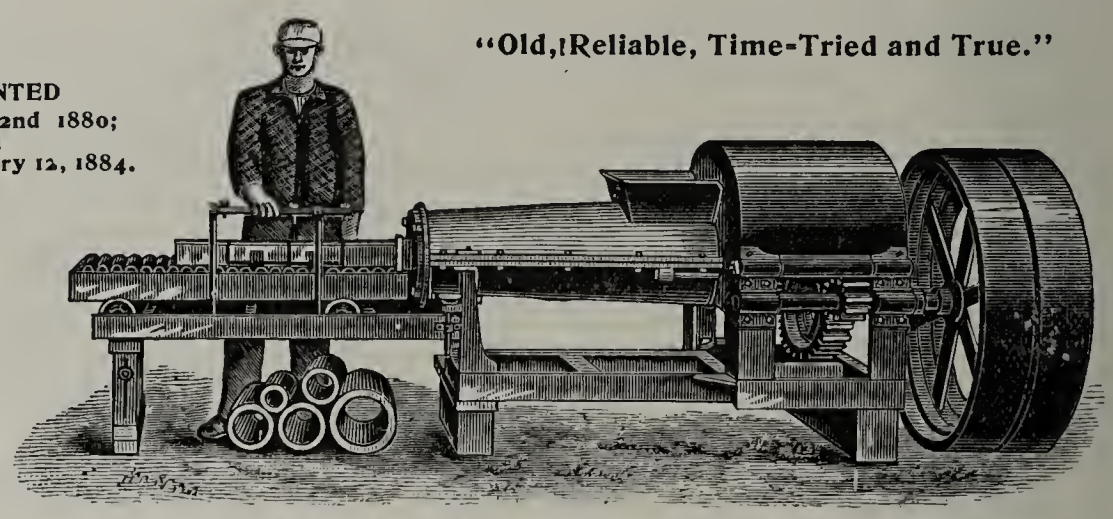
W. B. MERSHON & CO.,
Saginaw. East Side Mich.

KELLS & SON'S

IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.
☞For Illustrated Circulars, Prices, Etc., address

KELLS' FOUNDRY & MACHINE CO., Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

MORRISON'S LATEST IMPROVED KILN

For Burning Building Brick.

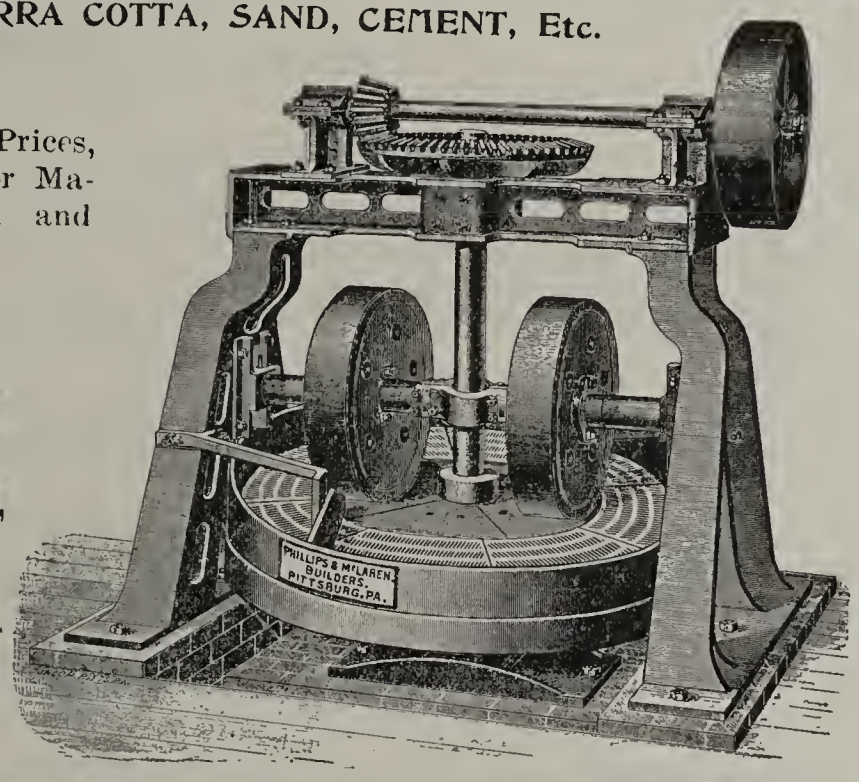
It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object. Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,
P. O. Box 335, Rome, Ga., U. S. A.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.



Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works.
24th and Smallman Sts.,
PITTSBURG, PA.

"La Brique" (The BRICK,)

ORGAN OF THE BRICK AND CERAMIC INDUSTRIES IN THE FRENCH SPEAKING COUNTRIES.

Published Monthly, Annual Subscription, $1.50.

10,000 copies sent by post and guaranteed by receipt from Postmaster.

Prices of Advertisements.

FOR ONE YEAR:		FOR ONE INSERTION:	
One Page,	$80.	One Page,	$40
One-half Page,	$50.	One-half Page,	$30
One-quarter Page,	$30.	One-quarter Page,	$20
One-eighth Page,	$20.	One-eighth Page,	$15

PAYABLE IN ADVANCE.

All correspondence to be addressed to

Mr. H. DeWit,
61 Rue Bodeghem, Bruxelles, Belgium.

Most forcible means of becoming known throughout the World, for Brick Engineers. Before the end of the year the journal will be published in English, French and German, so that it may be read by every brickmaker in any part of the world! With the publication in three languages prices of subscription and advertisements will be augmented except for those who will have already signed contracts.

Subscriptions and Advertisements for "La Brique"
Are received by the Publishers of THE CLAY-WORKER, Indianapolis.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

FOR SALE.

One Iron Standard Steam Power Machine, with pug-mill attached.
One Anderson Brick Machine, with 12-foot Pug Mill.
One new Brewer Crusher; one second-hand Brewer Crusher.
One Carnell Repress.
One Penfield Soft Mud Machine.
One 40-h. p. Boiler and Engine.
One Monarch Machine, used two summer seasons; in excellent repair.
THE HORTON MFG. CO.,
8 1 1 Painesville, Ohio.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.
PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.
SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address
WM. LENDEROTH,
Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 4 tf d

Davis's Brick, Tiles and Terra Cotta. Third Edition. Revised, Improved and Enlarged.

A Practical Treatise on the Manufacture of Brick, Tiles and Terra-Cotta:

Including Stiff Clay, Dry Clay, Hand-made, Pressed or Front, and Roadway Paving Brick, Enameled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra Cotta, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics, and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace With a Detailed Description of the different clays employed, the most Modern Machinery, Tools and Kilns used, and the processes for Handling, Disintegrating, Tempering and Molding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition. Revised and in great part rewritten. Illustrated by 261 engravings. 662 pages, 8vo. Price, ... **$5.00**

☞ *This volume will be sent by mail to any address in the world, or delivered by express C. O. D, freight paid, to any address in the United States for* **$5.00**

☞ *A circular of eight pages with specimens of the illustrations, showing the full Table of Contents, will be sent free to any one furnishing his address.*

☞ *Our New and Revised Catalogue of Practical and Scientific Books, 92 pages, 8vo, a New Catalogue of Books on Steam, the Steam Engine, etc., and our other Catalogues and Circulars, the whole covering every branch of Science applied to the Arts, sent free and free of postage to any one in any part of the world who will furnish us with his address.*

HENRY CAREY BAIRD & CO.,
Industrial Publishers, Booksellers and Importers,
810 Walnut St. PHILADELPHIA, PA., U. S. A.

Eureka Brick Elevator, Made in Four Styles.

A slick profitable device for handling brick in kiln or boat.

A. C. Newton, Manufacturing Patentee, **Crescent, N. Y.**

$6.95 to $99.75

At from $6.95 for a 100-pound house safe to $99.75 for a very large double outside and double inside door bank or public office safe, we sell the HIGHEST GRADE FIRE-PROOF COMBINATION LOCK SAFES MADE, letter your own or firm name on, and ship to anyone any place in the United States, payable after received. For $23.95 we sell a good size safe for any store, office, factory, shop or hotel. We will save you more than one-half in price. For full particulars, special safe catalogue, special pay-after-received offer, etc., cut this notice out and mail to us. SEARS, ROEBUCK & CO., CHICAGO.

Clay Workers

WILL SAVE MONEY BY CORRESPONDING WITH

W. R. Osborne,

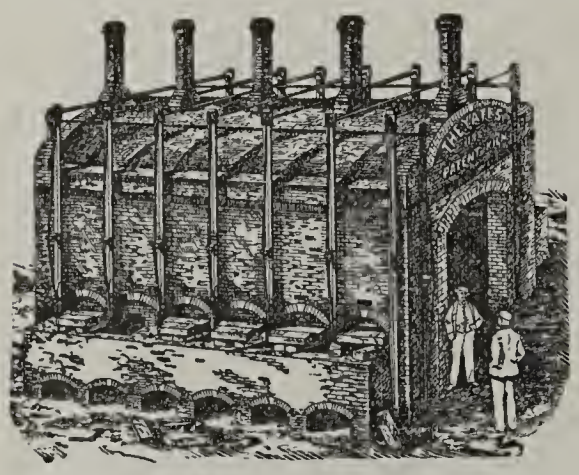
Metuchen, N. J.

When in want of Second-hand

BOILERS,
ENGINES,
TANKS and
PUMPS,

Of any Size or Design.

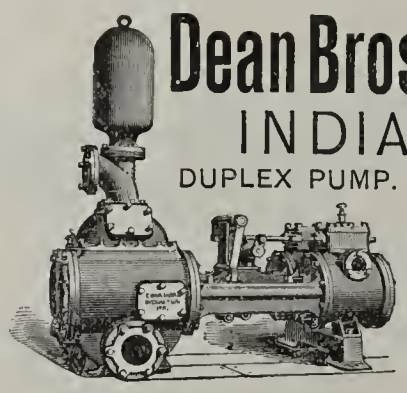
All machinery thoroughly overhauled and guarantee as represented.
Let me know your wants.



Economy of Fuel and Large Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.
Hot air dryer. Continuous and Muffle Kiln.

ALFRED YATES,
JOHNSONBURG, PENN



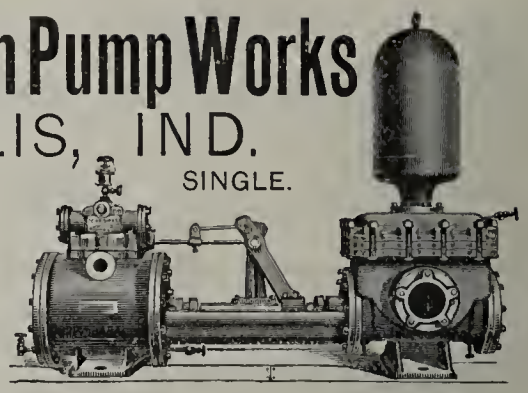
Dean Bros.' Steam Pump Works

INDIANAPOLIS, IND.

DUPLEX PUMP. SINGLE.

PUMPING MACHINERY FOR ALL PURPOSES.

SEND FOR CATALOGUE AND PRICES.



Drying Economy.

Our Dryer is superior to others by reason of improved methods, low cost of construction and economy of operation. If you're interested in dryers write for particulars. Ours will prove a good investment.

We also manufacture Conveyors, Exhausters, Heaters, Fans, Engines and Mechanical Draft Apparatus.

THE NEW YORK BLOWER CO.,
Bucyrus, Ohio.

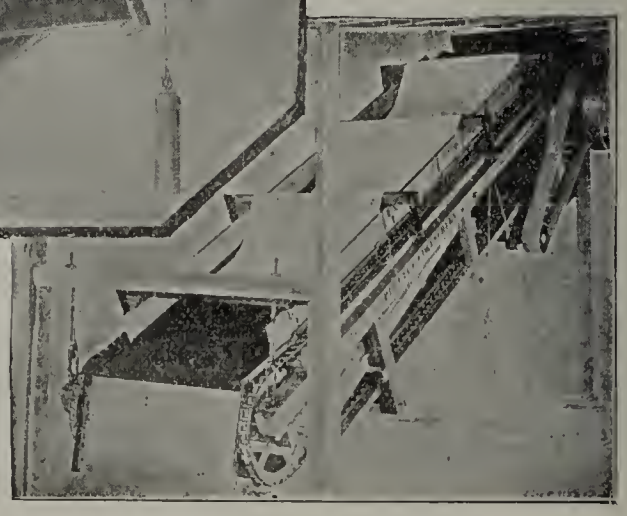
NEW YORK OFFICE
39-41 Cortlandt St., New York, N. Y.
BOSTON OFFICE:
185 Summer St., Boston, Mass.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush.

HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels, Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., Western Ave, 17th-18th St. CHICAGO, ILL.

Our new Catalogue No. 25 (380 pages), will be sent upon application.

New Illustrated Catalogue

NOW READY.

ELEVATING and CONVEYING **Machinery**

Send for Copy.

Address

The Jeffrey Mfg. Co., COLUMBUS, OHIO.

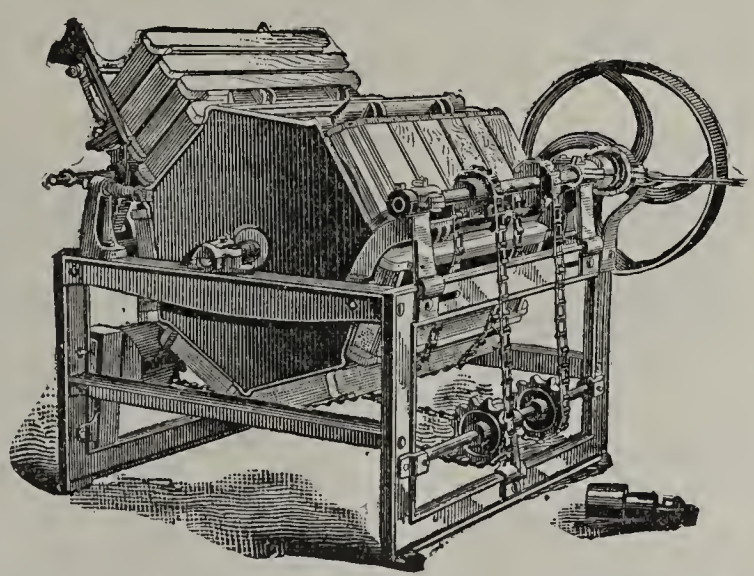
41 Dey St., NEW YORK. 544 Equitable Bldg., DENVER.

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of WELLS & HALL, Successors to WESTBROOK & WELLS, Ogdensburg, N. Y.

VanDuzen's STEAM JET Pumps.

Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. **Carbonate of Barytes**

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

LE CHATELIER'S

PYROMETER

For measuring temperatures between 0 and 1600° Celsius, equal to 2920° Fahrenheit.

RECOMMENDED BY THE HIGHEST AUTHORITIES, and Successfully used in establishments for the manufacture of

BRICKS, TILE, TERRA COTTA, STONE WARE, PORCELAIN, IN POTTERIES AND ALL CLAY WORKING INDUSTRIES, as well as

IRON AND STEEL AND ALL OTHER METALS,

Gas, Chamotte,
Glass, Chemicals,
Sugar, Cement,
Accumulators, Incandescent Lamps,
Cartridges and Ammunition.

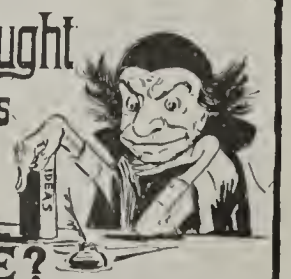
Also by Boiler Inspectors, Schools and Colleges and for **Hardening and Annealing Steel in Roll Foundries, Etc.**

CONSTRUCTED BY
W. C. HERAEUS, Platinum Works,
Hanau, Germany.

Prices and Descriptive Pamphlet on Application.

REPRESENTATIVE:
CHARLES ENGELHARD,
41 Cortlandt Street, New York, N. Y

Have you thought About your Cuts for your NEXT CATALOGUE?



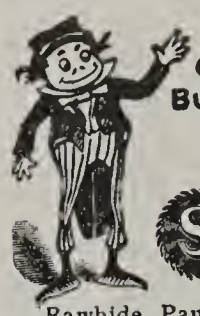
We Make 'em Right

INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.
INDIANAPOLIS, IND.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent. CINCINNATI, OHIO

H. W. FULLER, Gen'l Pass. Agent, WASHINGTON, D. C.



It will also pay you to Get Our Prices Before Buying, RUBBER, CANVAS AND RED STITCHED

BELTING

SAWS

Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gages, Brass Fittings. Hard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weiler Jacks, Circular Saws, Wood Sawing Machines One Man Log Saws, Asphalt Felt Roofing. Endless Thresher Belts a specialty.

Warerooms opposite (south) Union Railway Passenger Station, in sight of all express offices and close to all freight depots. Quick shipments. ONE TRIAL will make you a regular customer.

Miller Oil & Supply Company,
INDIANAPOLIS, IND.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.

Leave Indianapolis, 3:35 a m, 8:25 a m, 3:05 p m, 5:00 p m, 7:10 p m.

Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.

Leave Indianapolis, 11:35 a m, 12:20 p m.

Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

—FOR—

Louisville and South.

THREE FAST TRAINS DAILY.

Lv Indianapolis, 4:10 am, 8:05 am, 4:00 pm, 7:10 pm 7:10 p m train, daily except Sunday.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

The VANDALIA LINE

The Short Line for St Louis and the West.

Leave Indianapolis.		Arrive at Terre Haute.	Arrive St. Louis
No. 15	7:25 am,	9:55 am	5:00 pm
No. 5	6:45 am	8:35 am	12:56 pm
No. 21	12:15 pm	2:05 pm	6:40 pm
No. 7	3:30 pm	5:10 pm	9:40 pm
No. 11	7:05 pm	9:00 pm	1:44 am
No. 19	11:20 pm	1:50 am	7:12 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

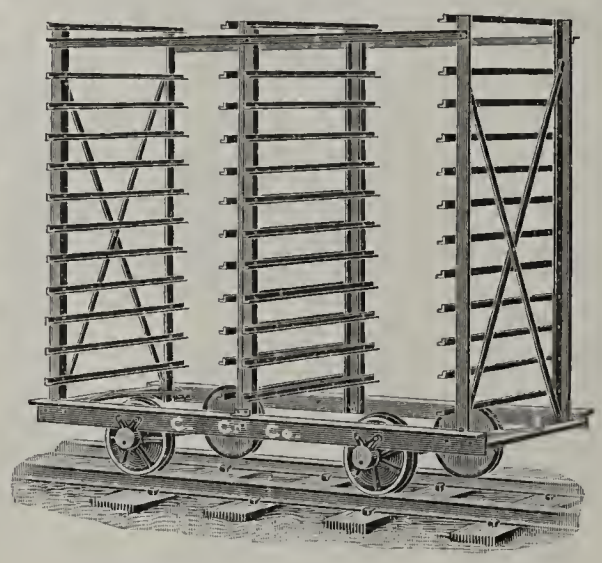
DAILY.

No. 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.

All trains carry first-class coaches.

12:15 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent,
E. A. FORD, G. P. A. Indianapolis, Ind.



No. 257 SOFT MUD RACK. Angle Frame.

OUR Specialty is the building of Dryer Cars. There are none better. Quality is our aim.

LIGHT,
RIGID,
SERVICEABL ,
STRONG,
DURABLE,
EASY RUNNING.

If interested write for particulars and information.

The CLEVELAND CAR CO.,
Cleveland, Ohio.

R·I·P·A·N·S

SOME PEOPLE eat because they think they ought to, not because they want to. They do it mechanically. They have no appetite but yet they feel they must eat to sustain life. Food does very little good under such conditions.

Sometimes a loss of appetite is the beginning of a physical break up. It is then, some simple, practical remedy like R-I-P-A-N-S Tabules is needed. These Tabules stimulate the flow of gastric juice in the stomach, create a zest for food, whip up the liver and clear out the intestinal tract. They strengthen and invigorate the body and make it clean within. They cost but little, ten for 5 cents, and are genuinely good.

At all drug stores.

WANTED:—A case of bad health that R·I·P·A·N·S will not benefit. They banish pain and prolong life. One gives relief. Note the word R·I·P·A·N·S on the package and accept no substitute. R·I·P·A·N·S, 10 for 5 cents, may be had at any drug store. Ten samples and one thousand testimonials will be mailed to any address for 5 cents, forwarded to the Ripans Chemical Co., No. 10 Spruce St., New York.

PATENTS GUARANTEED

Our fee returned if we fail. Any one sending sketch and description of any invention will promptly receive our opinion free concerning the patentability of same. "How to obtain a patent" sent upon request. Patents secured through us advertised for sale at our expense.

Patents taken out through us receive *special notice*, without charge, in THE PATENT RECORD, an illustrated and widely circulated journal, consulted by Manufacturers and Investors.

Send for sample copy **FREE.** Address,

VICTOR J. EVANS & CO.,
(*Patent Attorneys,*)
Evans Building, - WASHINGTON, D. C.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS Agent and Patentee, **161 Grand Street, Rahway, N. J.**

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

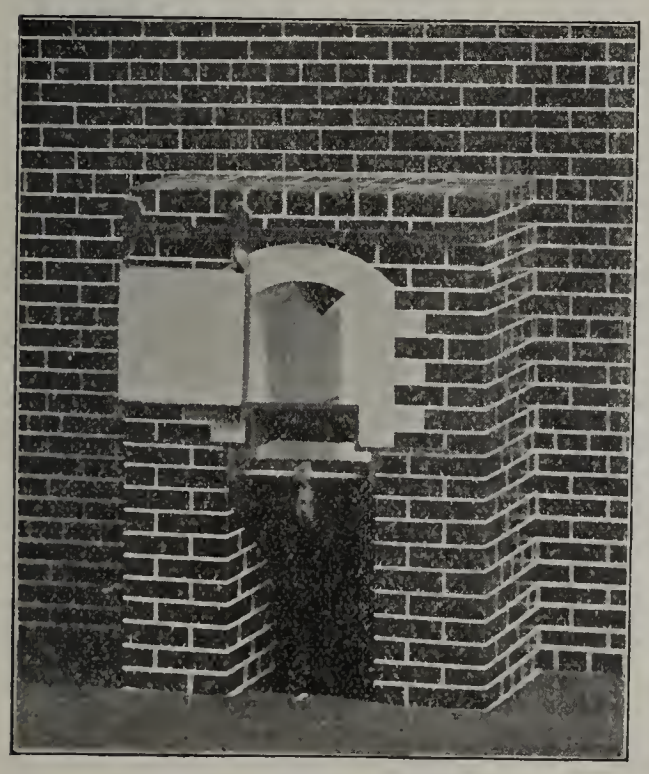
Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } **Chenoa, Ill.**

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.



For **uniformity** in **burning, hardness** of **ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump,** and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

OLD DOMINION LINE

DAILY SERVICE

Between Old Point Comfort and Norfolk, Va. and New York.

FINE STEAMERS.
QUICK TIME.
EXCELLENT SERVICE.

For tickets and general information apply to railroad ticket agents, or to M. B. CROWELL, General Agent, Norfolk, Va.; J. F. MAYER, Agent, 1212 Main St. Richmond, Va.

H. B. WALKER, Traffic Mngr. J. J. BROWN, Gen. Pass. Agt. } New York, N.Y.

Indiana, Decatur & Western RAILWAY.

Short line between **INDIANAPOLIS** and **KANSAS CITY.** The **only line** running **Reclining Chair and Sleeping Cars** between **CINCINNATI** and **INDIANAPOLIS, DECATUR, SPRINGFIELD, JACKSONVILLE, HANNIBAL** and **QUINCY.**

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	4.05 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent. Indianapolis, Ind.

Solid Train Between **Sandusky and Peoria** —AND— INDIANAPOLIS and MICHIGAN CITY, FT. WAYNE and CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

	Depart.	Arrive.
Toledo, Chicago and Michigan, ex	†7:00 am	*10:25 am
Toledo, Detroit and Chicago lim	*12:20 pm	†4:15 pm
Muncie, Lafayette and Laporte, spec	†7:20 pm	†10:25 pm

*Daily. †Ex-Sunday.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent, Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt., INDIANAPOLIS, IND.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

R. D. CULVER, Pres. and Gen'l Man.
I. G. POSTON, See'y and Treas.

The Wabash Clay Co.,

MANUFACTURERS OF ALL SHALE

PAVING **BRICKS** AND BLOCKS.

Our leading brands are POSTON BLOCK, WABASH STANDARDS, "SPECIALS," for crossings on macadam streets, GUTTER BLOCKS and COLUMBIAN SIDEWALK BRICK.

Our material has for years successfully stood the heaviest traffic of Indianapolis, Terre Haute, East St. Louis and dozens of other large cities of Indiana and Illinois. We ask investigation and comparison by those seeking the best paving material. Samples furnished on application.

Office and Works at VEEDERSBURG, IND.

Preston Brick Co.,

MANUFACTURERS OF

Vitrified Shale Paving Brick,

SEWER AND HARD BUILDING BRICK.

Hornellsville, N. Y.

T. B. McAVOY, PRESIDENT.
FRANK B. McAVOY, SEC. AND TREAS.

McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades.
Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING. SYRACUSE, N. Y.

W. C. SIBLEY, PRES. J. W. SIBLEY, GEN'L. MAN.

THE COALDALE PAVING BRICK CO.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

COALDALE VITRIFIED PAVERS,
Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.
The extent and character of our clays and facilities for manufacture insure uniform quality of product.
Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT, COALDALE, ALA.
TELEGRAPH OFFICE, WARRIOR, ALA.
BRANCH OFFICES BIRMINGHAM, ALA., MONTGOMERY, ALA., NEW ORLEANS, LA.

The Eastern Paving Brick Co.,

MANUFACTURERS OF THE HIGHEST GRADE

VITRIFIED PAVING BRICK and BLOCK,

For Streets and Sidewalks. Positive guarantee as to wearing qualities. Largest capacity in the East.
Correspondence solicited.

Office and Works, CATSKILL, N. Y.

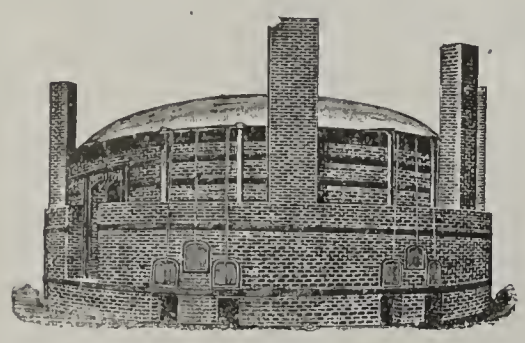
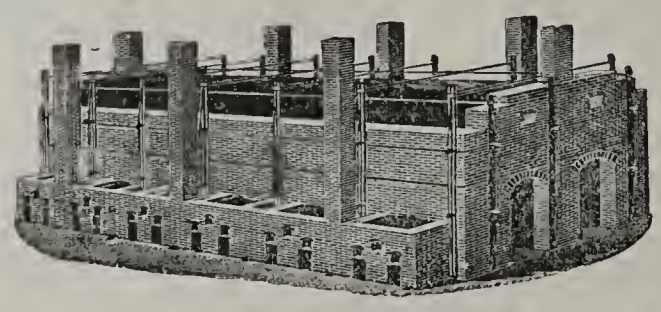
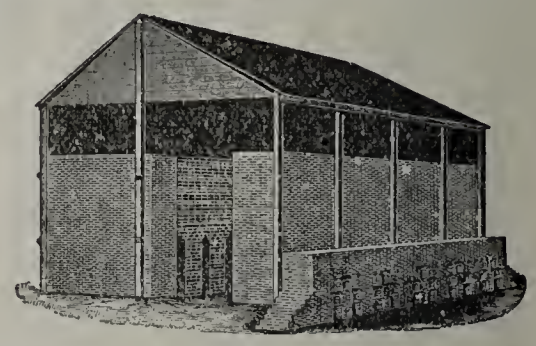
Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date.
By H. A. Wheeler, E. M.
Mailed to any address on receipt of $1.00.

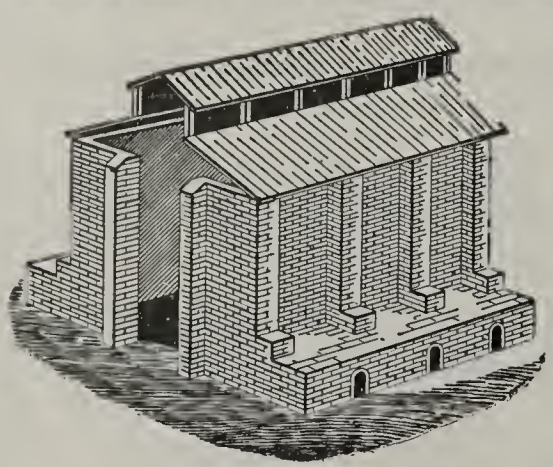
T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The Swift Slack Coal Coking Table Furnace Kiln.

Now in reach of all, both great and small.

$25.00 Will give you a chance to investigate the merits of the famous **Swifts Furnaces** and kilns. Write for particulars. **F. E. SWIFT, Washington, Iowa, U. S. A.**

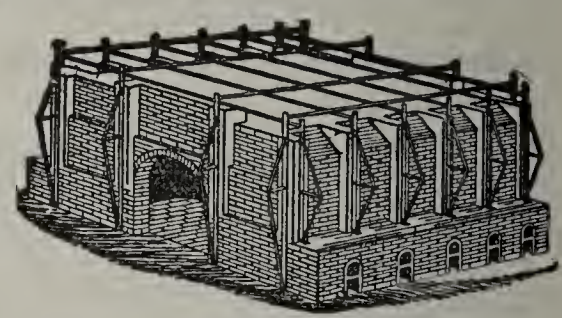


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, **2,422 Chestnut St.,** ***Kansas City, Mo.***

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

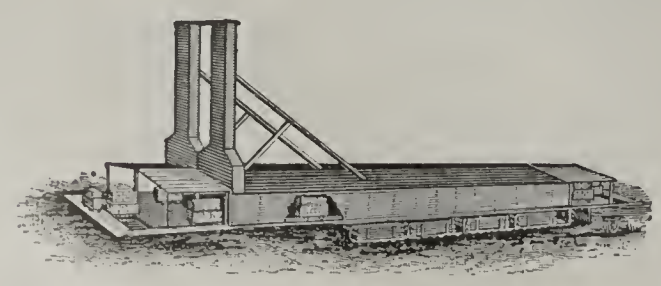
Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

A. F. BARRON,

Patentee and Builder of the

CHICAGO IRON CLAD and BARRON'S TENDER CLAY DRYERS.

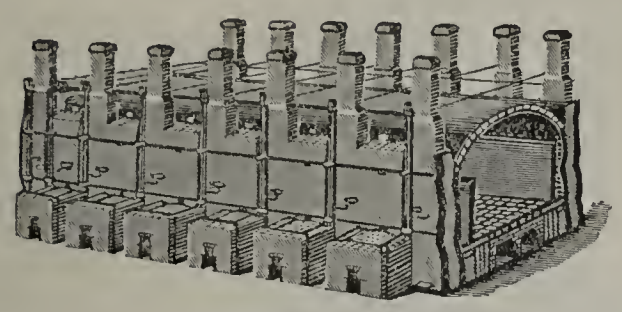


These are the gradual outgrowth of a correct principle patented 28 years ago. Every year since that date has witnessed improvements that has kept this system beyond the reach of competition and we now can build Dryers to dry clay products of every grade, even if the clay is of a tender nature. The original principle is still retained. Crude methods of application displaced by money saving devices in steam fitting and construction—enabling patrons to turn out clay products of highest grade in strength and color and at a great saving in expenditure of fuel. In seeking information mention the peculiar nature of the clay, process of manufacture, etc. Address,

A. F. BARRON.

Temple Court Building. CHICAGO, ILL.

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Streator, Ill., October 3, 1900.
M. M. BUSHONG, Esq.,
Phoenixville, Pa.

Dear Sir:—Answering yours of September the 27th, we have been using one of the Bushong Down Draft Kilns the past fifteen months and are well pleased with it. We get a larger percentage of No. 1 pavers with a little less fuel than any other kiln on the yard.

Yours truly,
THE BARR CLAY CO.,
Per C. C. Barr, Treas.

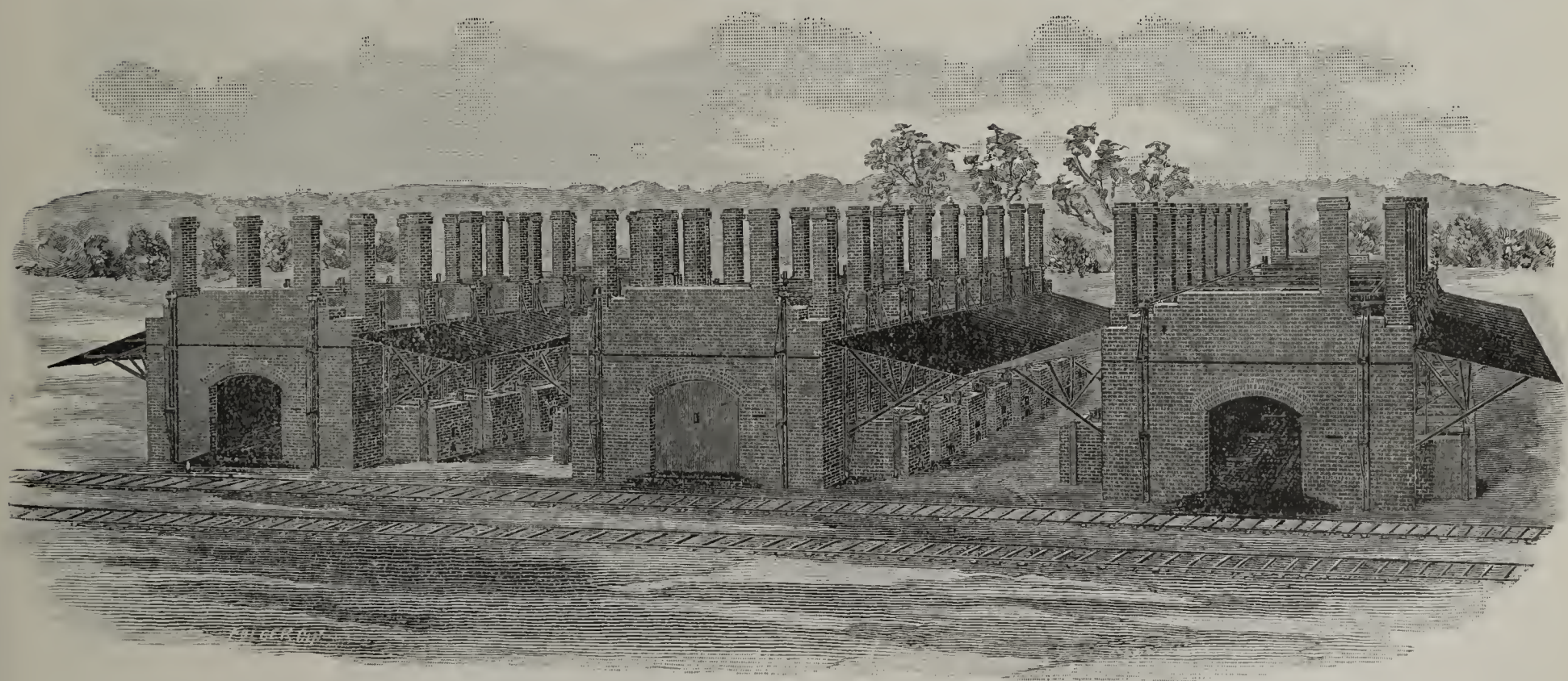
BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.



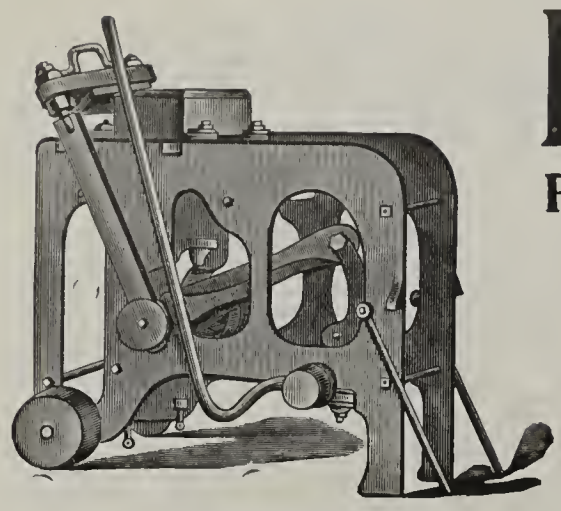
These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



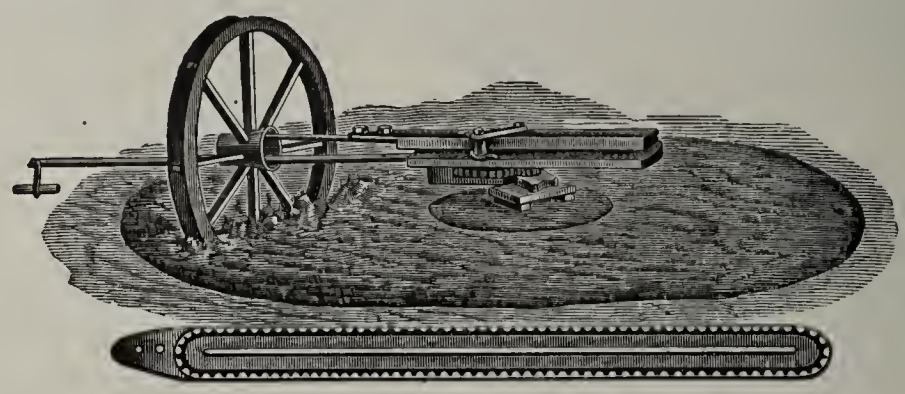
RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

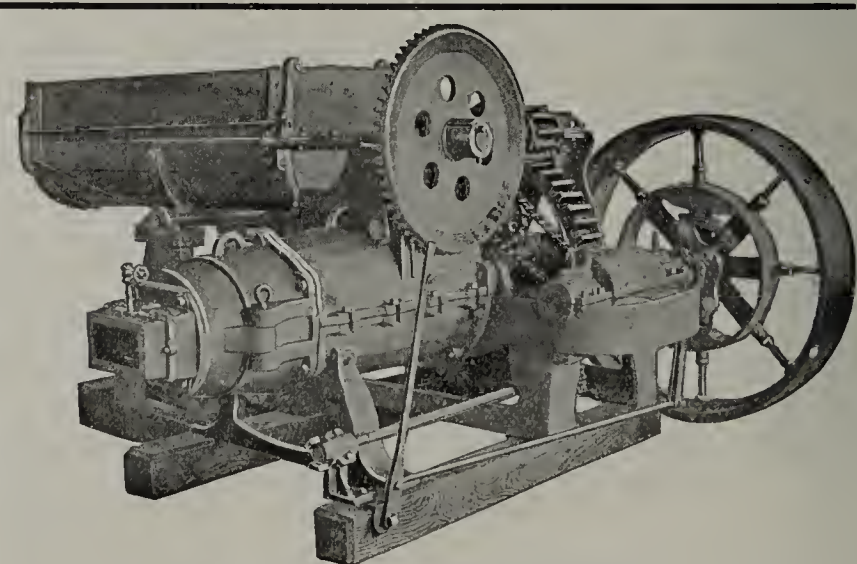
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.

TAKE A LOOK



At this for a Combined Machine. It has the advantages of other combined machines and others besides. It does not interfere with the stiffness and rigidity of the machine "proper."

The feed end of Pug Mill is clear of all machinery. Pug Mill is hinged so it can be raised clear of Machine, leaving everything free of access.

Let us talk to you about it.

J. C. STEELE & SONS,

Manufacturers of
The "NEW SOUTH" BRICK MACHINERY,

Statesville, N. C.

All That Could be Desired.

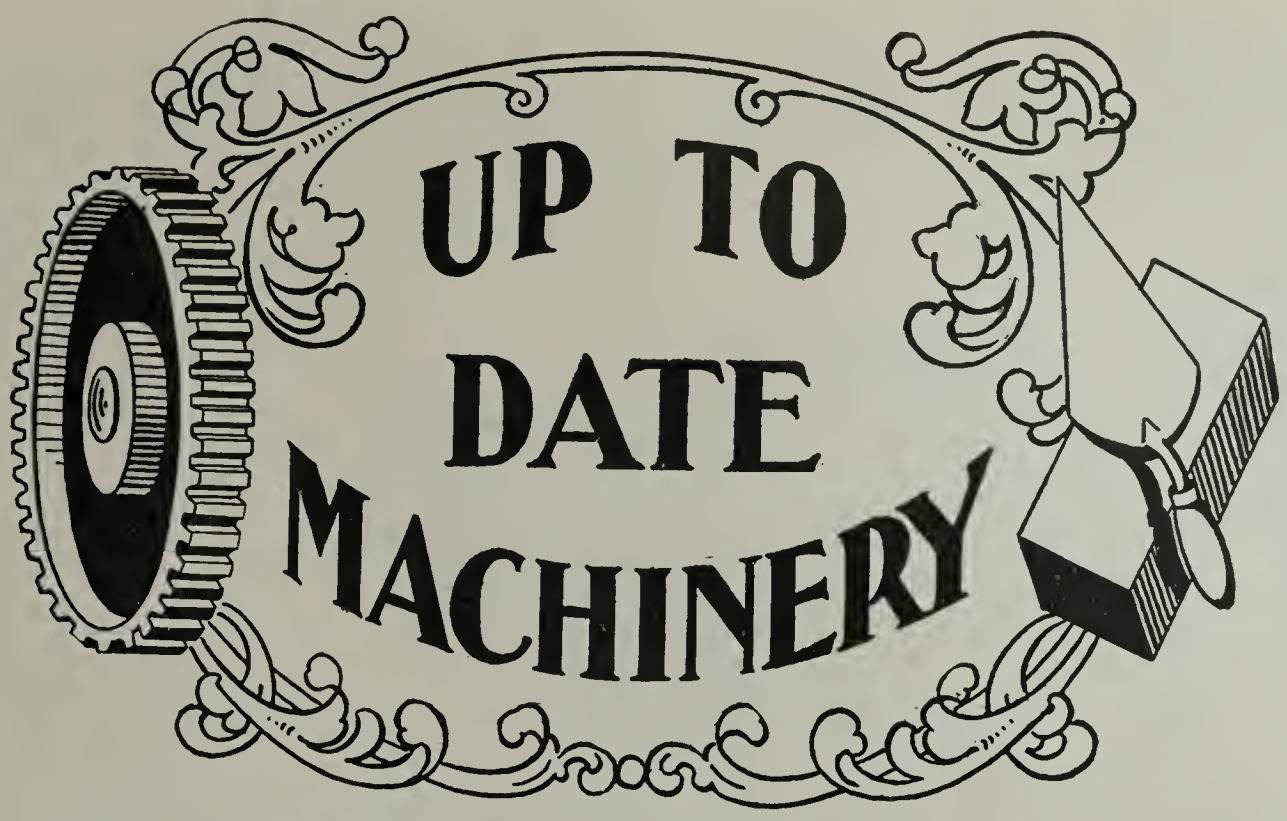
Kinston, N. C., March 27th, 1900.

Messrs. J. C. STEELE & SONS, Statesville, N. C.

Gentlemen:—We herewith enclose check for $—— in settlement of the brick machine, cutting table, etc., purchased of you a short time ago, for which kindly send us receipt.

The machine is working well and we are extremely well pleased with it. It is all that could be desired.

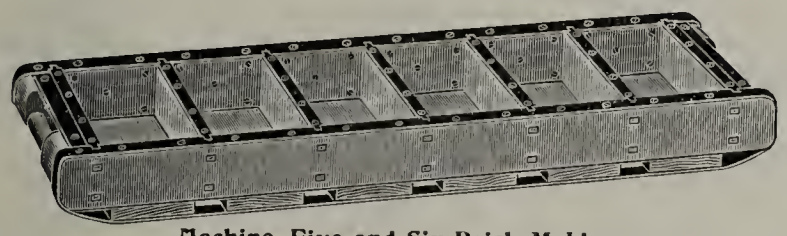
Very truly yours, L. HARVEY & SON.



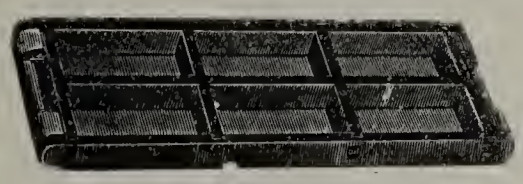
When Buying New Machinery

Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front an Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.

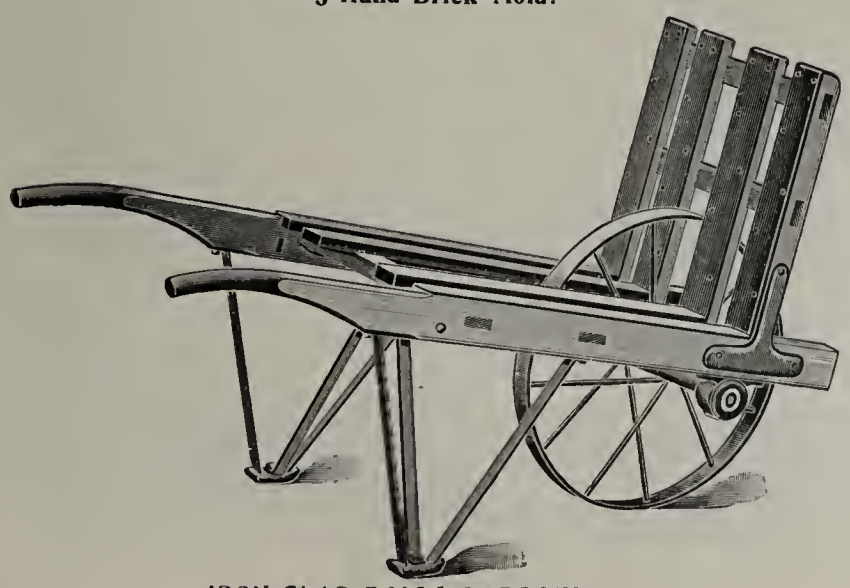


Machine, Five and Six Brick Mold.



6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

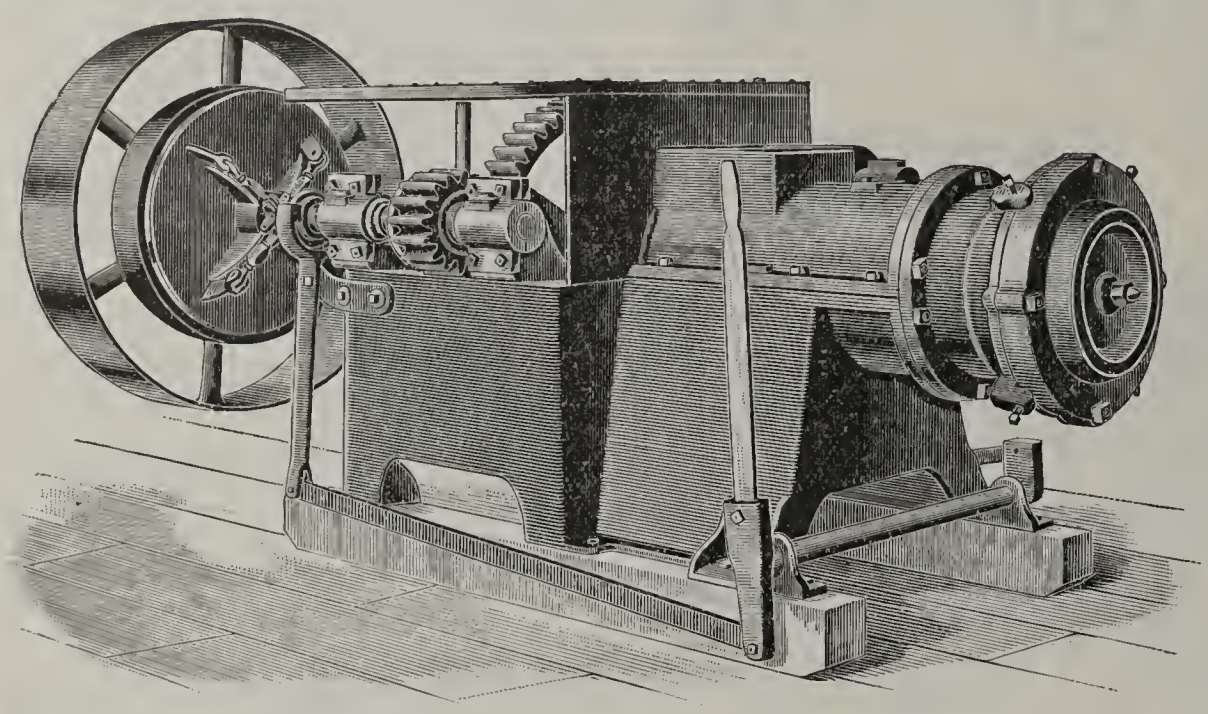
SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

D. J. C. ARNOLD,

New London, O.

HIGHLY PLEASED.



LEADER No. 25 with Drain Tile Die Attached.

OFFICE OF
STICH BROTHERS
MANUFACTURERS OF
Drain Tile and Brick.
O. M. STICH, Manager.

Livermore, Ia., August 6th, 1900.
LEADER MFG. CO.,
Decatur, Ill.

Gentlemen:—We have been using the Leader Tile and Brick Machine since March 1896 and thus far it has proven satisfactory in every way. We can make from 25,000 to 30,000 brick per day, and tile in proportion, and they are all that can be desired.

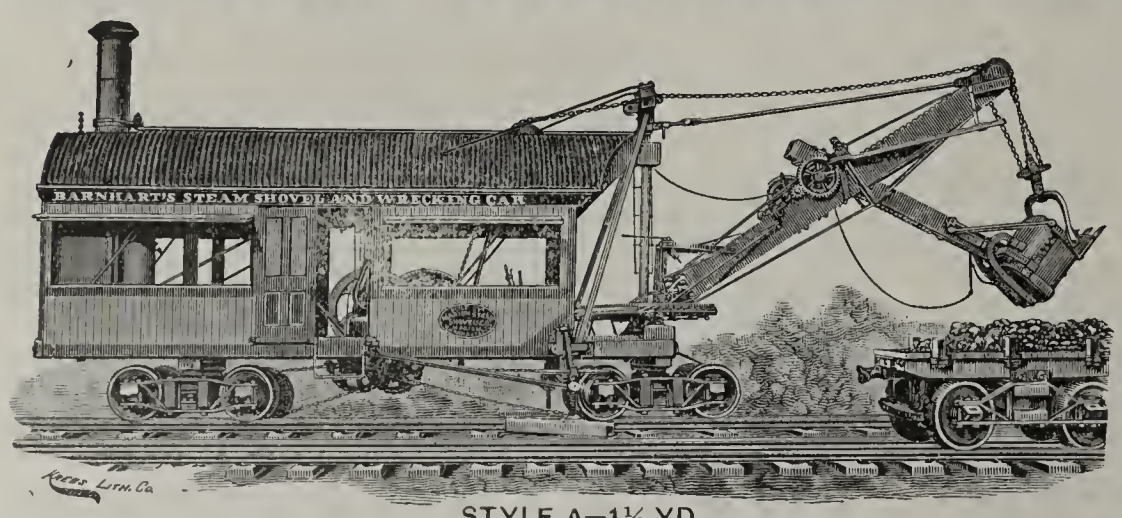
We are HIGHLY PLEASED WITH the MACHINE AND RECOMMEND IT AT ALL TIMES.

Yours truly,
STICH BROTHERS.

Our new Catalogue is ready for you.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**

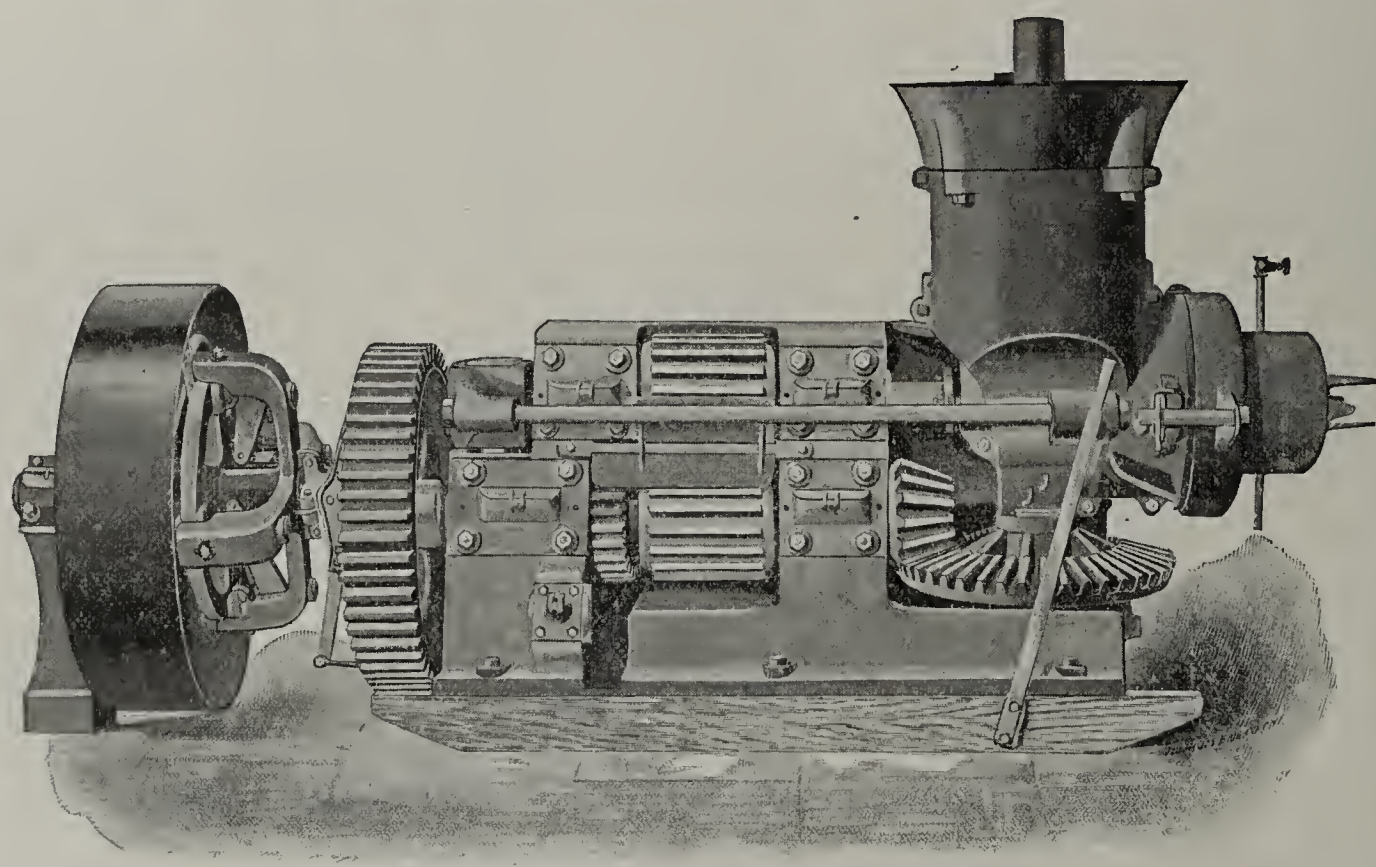
A MESSAGE FROM THE SEA.
THE AMERICAN CLAY-WORKING MACHINERY CO. BUCYRUS, O. U.S.A.
NEPTUNE BRICK Co.
WAVE POST OFFICE
Wave, August 1, 1900.
The American Clay-Working Machinery Co.,
Bucyrus, Ohio, U.S.A.
Gentlemen:-
We have received the machinery which arrived on the "Pauillac." It was about the only thing saved from the wreck, but we could afford to lose all else as we are more than pleased with the machinery. The #2 Giant Machine and Automatic Cutter are making 50,000 perfect brick per day and we have no trouble in handling them. We would be glad if you would send us one of your Bucyrus Steam Tunnel Dryers, as it is hard to get rid of moisture down here, and we understand that your Dryer will dry anything.
The Eagle Repress is a bird. If we had had this outfit years ago, we could have built the piers for the Brooklyn bridge. We would not trade your machinery for any other. We know it is "Built Right" because it "Runs Right" and so far, it "Doesn't Disappoint."
With best wishes, I am,
Yours truly,
King Neptune.
His Mark.
P.S. We hope you get this letter. We are going to send it in one of those funny bottles we found in one of the boxes. Thanks for the Smith Premier Typewriter. I operated the one that went down with the "Main" until a diver recovered it. It worked perfectly even under the most trying hydraulic condition.
PAULIAC
BUILT RIGHT RUN RIGHT
The Machinery that never Disappoints
Smith Premier

Have You Troubles of Your Own.

Most brickmakers have when their clay laminates.

If you have this trouble—tell us about it—let us help you bear your burdens—buy a **Wonder Brick Machine** and your troubles cease.

Lamination completely destroyed.



Big Wonder Brick Machine.

Write for our No. 16 catalogue and Good Luck Booklet. Sent free on application.

The Wallace Mfg. Co.,

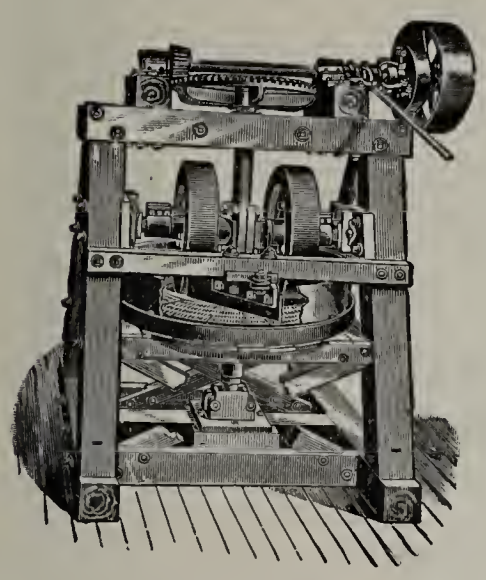
FRANKFORT, IND.

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

SOUTHERN MACHINERY CO., Charlotte, N. C., **Agents for Tennessee, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina and Virginia.**

OUR SPECIALTY IS

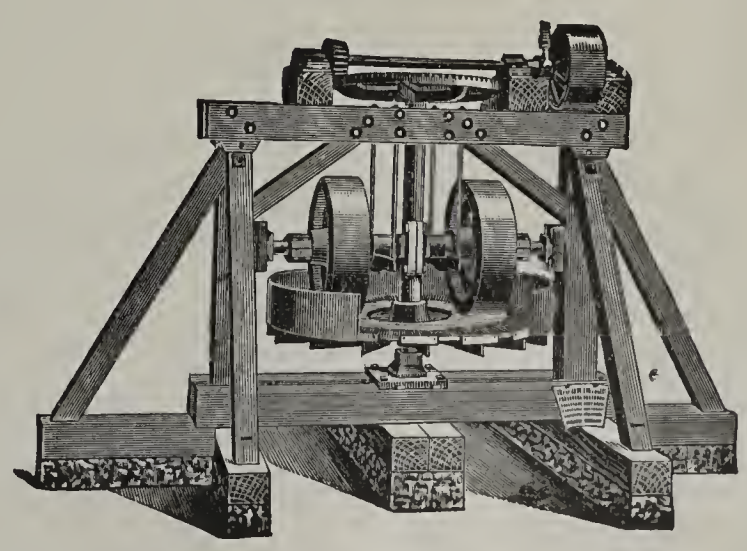
DRY PANS.



IRON FRAMES,

WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill., U. S. A.

Judgment Confirmed.

Our Medal, Awarded at Paris Exposition. The only Medal Awarded for Clay Working Machinery from the United States.

THE JUDGMENT of the army of Clay Workers of the United States has been confirmed by the jury of awards at the Paris Exposition. Years ago the United States trade learned to look with confidence to the American Clay-Working Machinery Company for all that was desirable in Clay-Working Machinery. Years of experience, backed by a corps of the most advanced designers and builders of this class of machinery, has kept the American line far in advance. This enviable reputation, which has been won by merit and acknowledged throughout the United States, has spread abroad and the medal awarded at Paris is the result. This award is not only a tribute to the worth of the American line, but is also a confirmation of the judgment of the Clay-Workers of the United States. "Doing beats promising" and if you want the prize winning line you'll find us willing to show you what HAS BEEN DONE and what CAN BE DONE on our machines.

If you contemplate the purchase of Dry Press, Stiff Mud, Soft Mud, Pottery or Cement Machinery, write us. Full particulars for the asking.

We Lead, Others Follow.
We Originate, Others Imitate.
We Guarantee, Others only Promise.

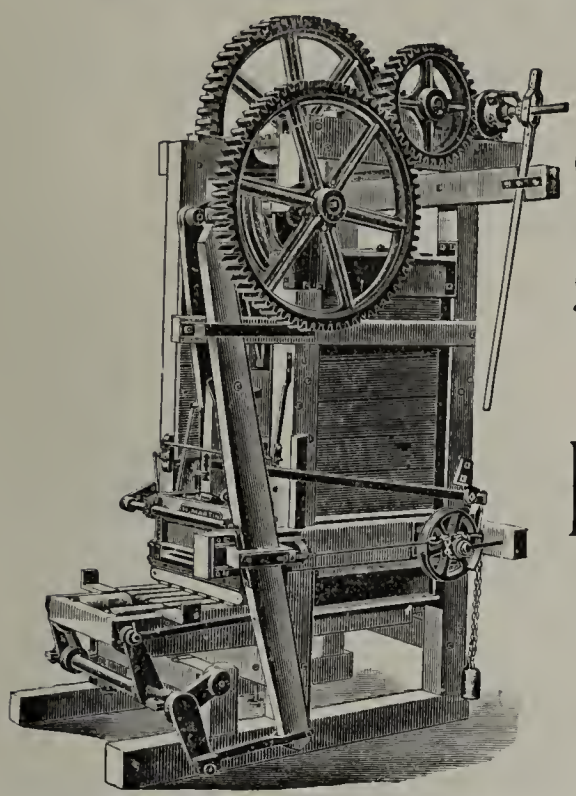
Our Medal, Awarded at Paris Exposition. The only Medal Awarded for Clay Working Machinery from the United States.

The... American Clay-Working Machinery Company,

BUCYRUS, OHIO, U. S. A.

New York Office--39 and 41 Cortlandt Street.

PLANS, SPECIFICATIONS, ETC.,



Will be cheerfully furnished on application for construction of

COMPLETE BRICK PLANTS.

Soft Mud Sand Faced Process

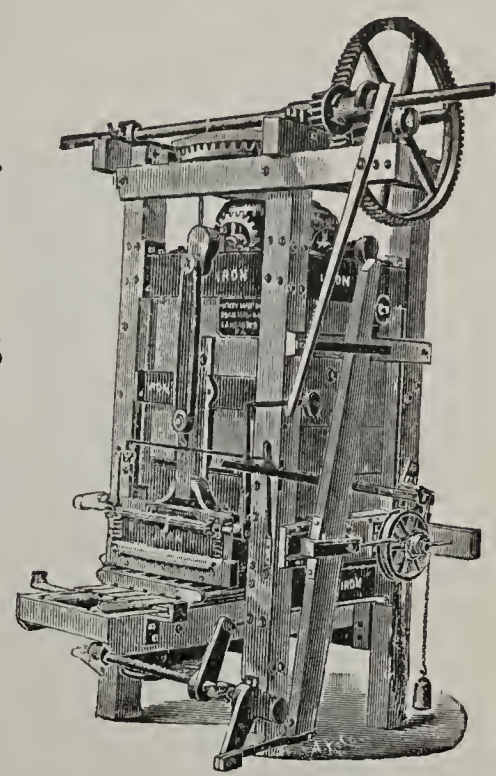
ON THE

Rack and Pallet System

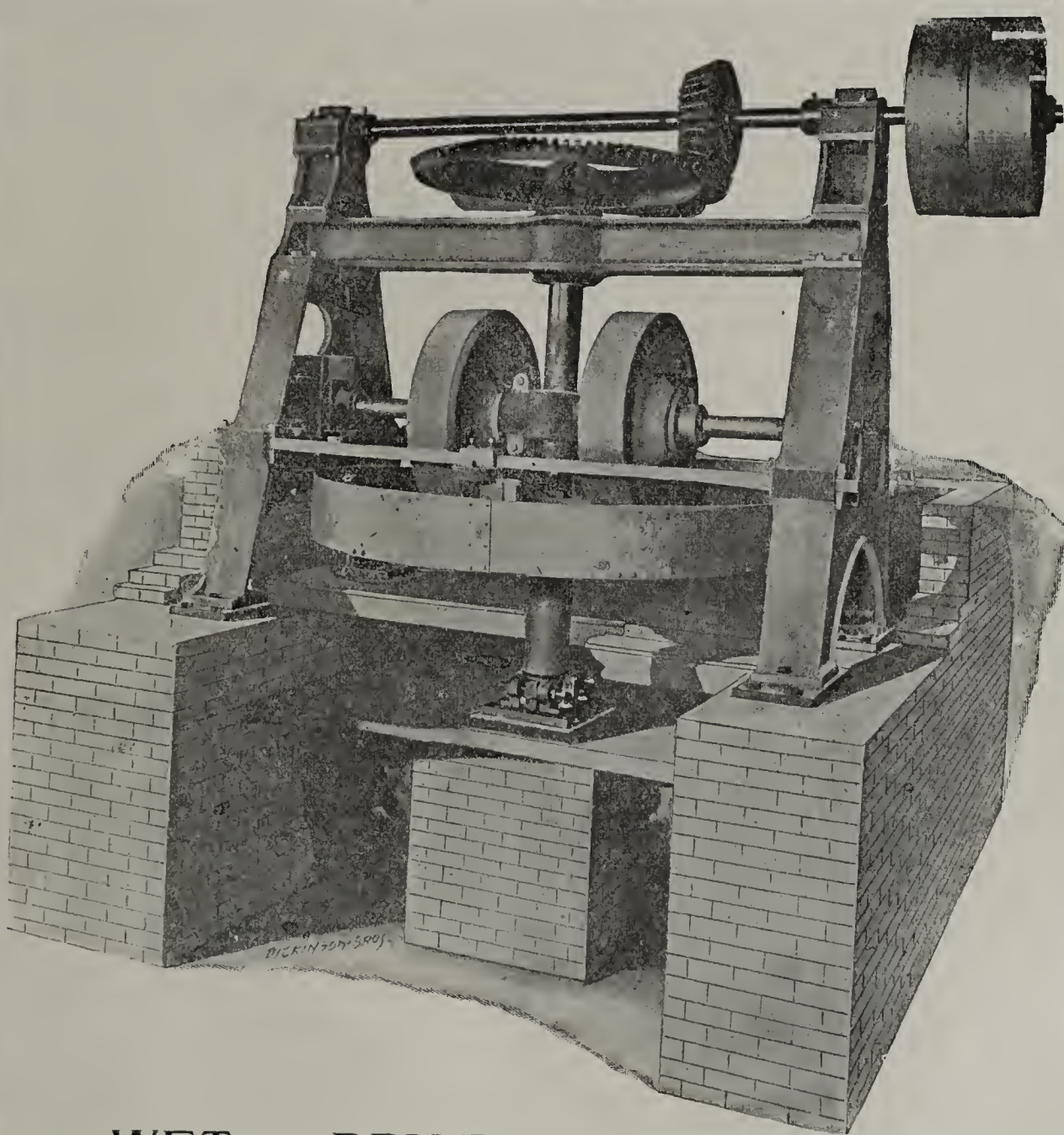
OR WITH

Steam Dryers,

Including Everything a Brickmaker Needs.



Send For General Catalogue No. 40.

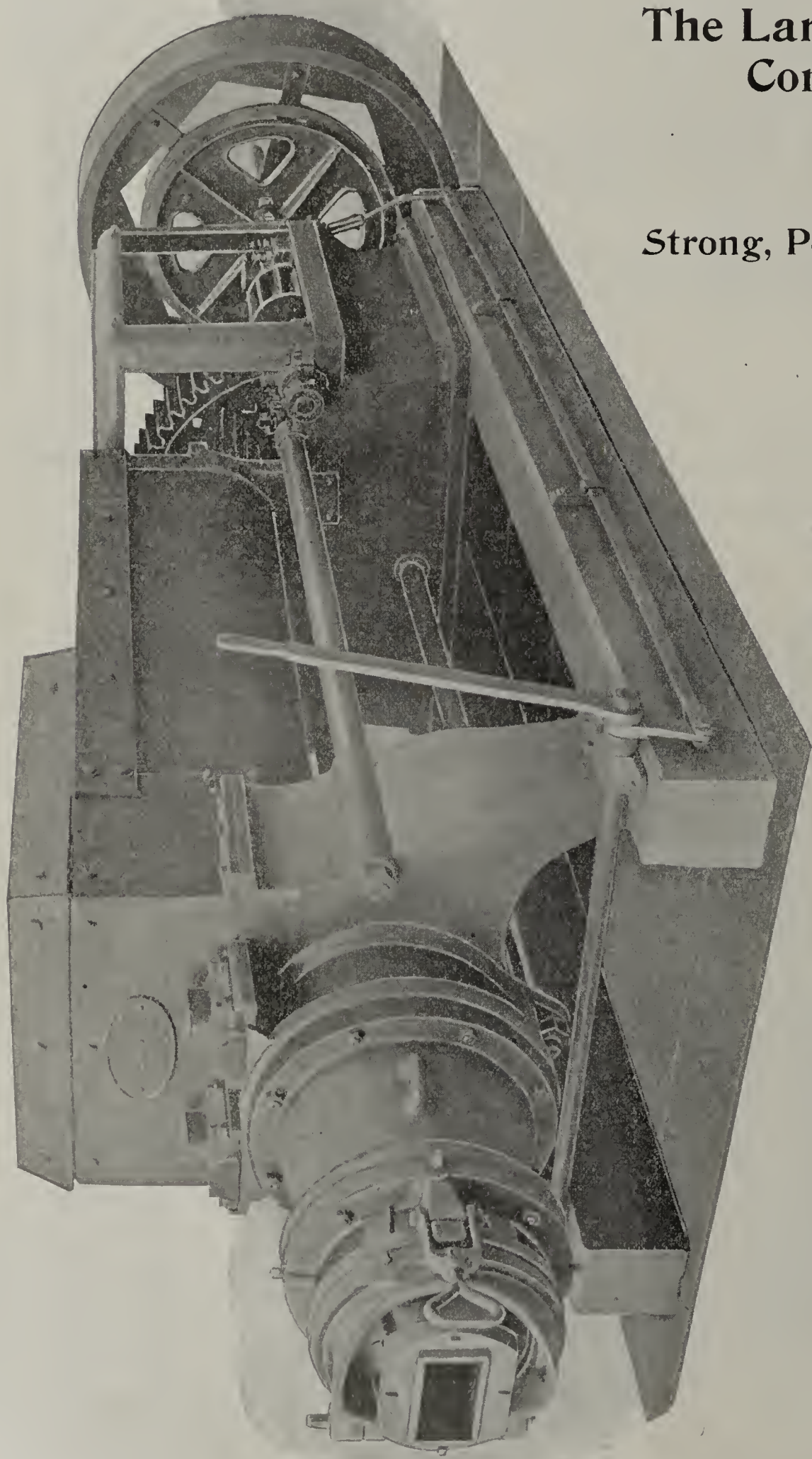


WET or DRY PAN. 7, 8 and 9 feet.

State Nature of Clay and Get Our Suggestions.

The Henry Martin Brick Machine Mfg. Co., Lancaster, Penn.

The "PREMIER" BRICK MACHINE.



The Largest Combined Pug Mill and Brick Machine.

Strong, Perfectly Proportioned, Positive Force Feed.

Pugging capacity more than doubled. Note the interior arrangement. Capacity 75,000 to 100,000 brick per day.

With the "PREMIER" and Bensing's Automatic Down-cut Brick Table you have an outfit that will make MORE BRICK and BETTER, SMOOTHER FACED BRICK from any clay or shale, than can be made from the same material by any other machine or process.

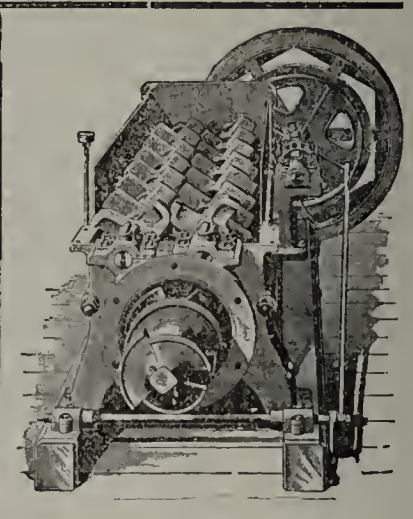
Write Us for More Particulars

Manufacturers of

"Plymouth" Brick and Tile Machines.

Bensing's Automatic Tables.

And other yard Supplies and Equipments.



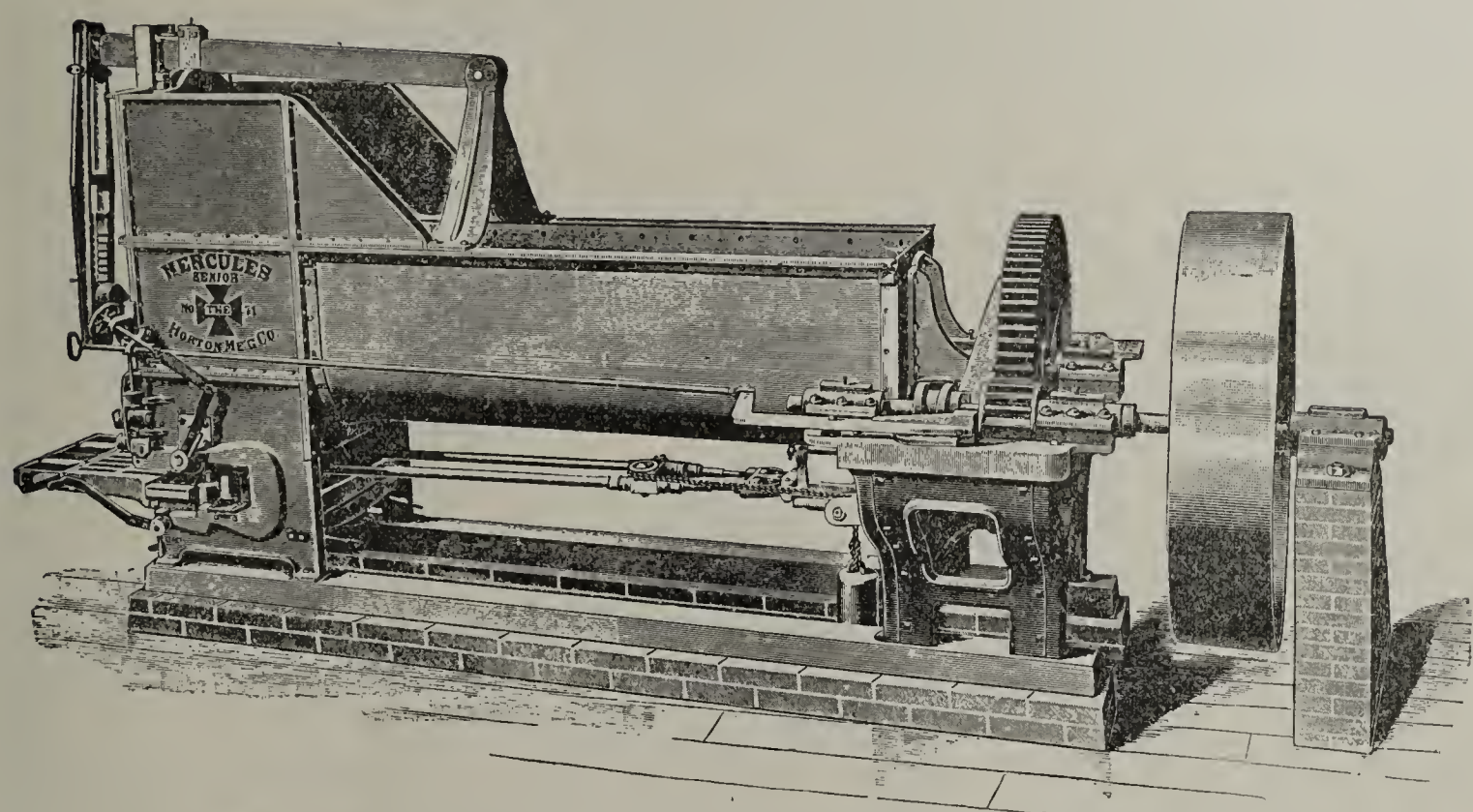
INTERIOR VIEW OF ABOVE MACHINE.

J. D. FATE & CO., Plymouth, Richland Co., Ohio, U. S. A.

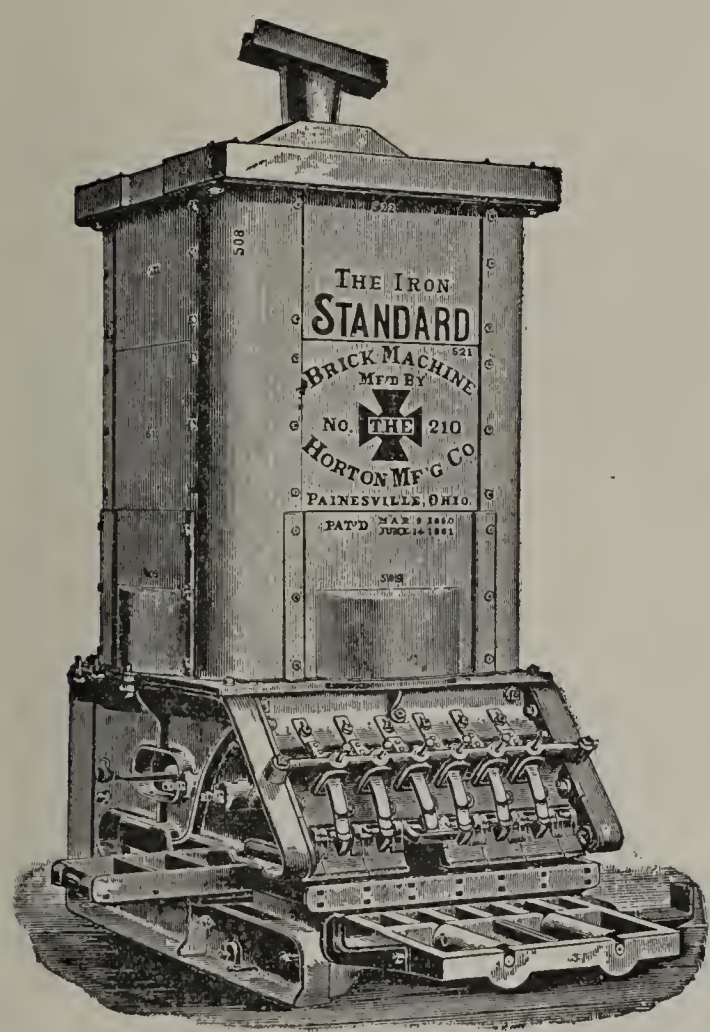
Western Representative:--B. E. LADOW, 1107 Chamber of Commerce, Chicago, Ill.
Agent for Virginia and North Carolina, H. L. JACOBS, Suffolk, Va.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES

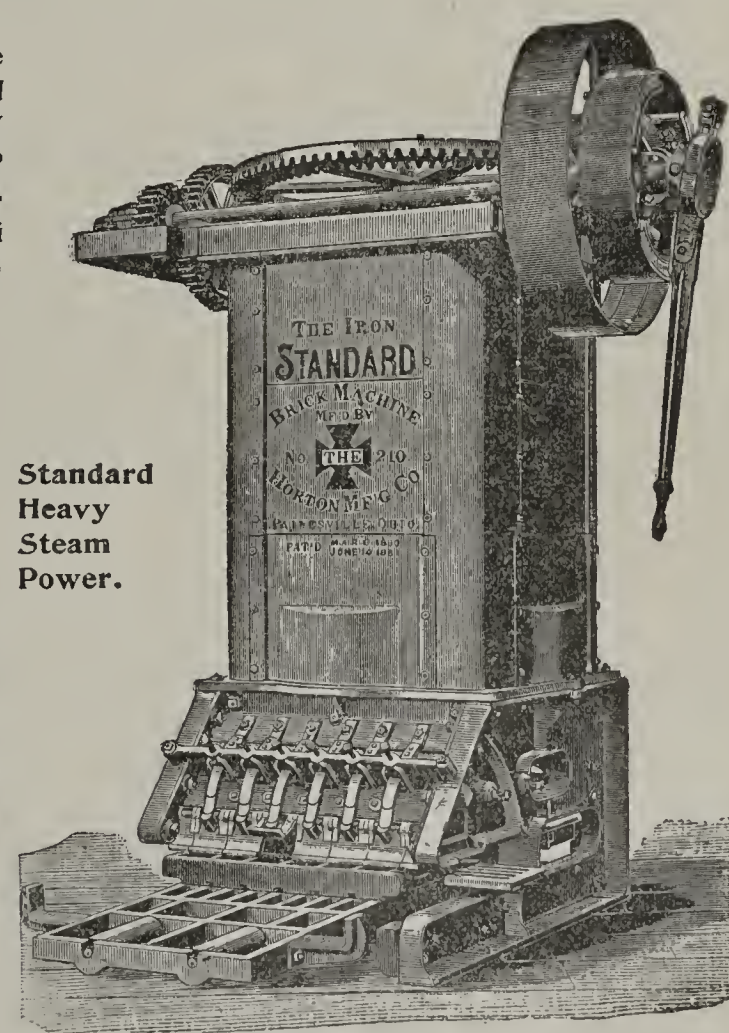


IRON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brick-yard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.



Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

Now Will You Be ....Good....

ONCE MORE the **Potts Patents** on **Clay Disintegrators** are delared to be good and valid. That all machines using adjustably secure dor solid bars cast to the roll, are infringements of the Potts Patents.

It is now only a matter of a short time until all manufacturers of these infringing machines will be prohibited from manufacturing or selling the same.

Don't let this trouble you as **C. & A. Potts & Co.,** are still in the business, and will furnish all the Disintegrators wanted. You will never have to go back to the old and expensive rolls.

The manufacturers of these infringing Disintegrators have the past six years told you the Disintegrator was the machine for you to use, if this was the case then it must be so now.

Remember the Disintegrator is the only machine ever made that will work any kind of clay direct from the bank and not choke or clog—it will grind the small stones and separate the large ones, it does not pack the clay into thin hard sheets, but leaves it in a loose open condition, so it will take water quickly and is easily pugged. It saves labor and improves the quality of Brick or Tile.

For prices write

C. & A. POTTS & CO.,
Indianapolis, Ind.

CHAMBERS BROS. CO., Philadelphia, Pa.,
Are the only Licensed Manufacturers.

BRICK MANUFACTURERS CANNOT AFFORD TO IGNORE THE SPLENDID QUALITIES OF THE CLAYWORKING MACHINERY MANUFACTURED BY **C. & A. POTTS & CO.**

Horizontal Stock Brick Machines, All Iron or Wood Frame.

PUG MILLS, DISINTEGRATORS, MOULD SANDERS, and all Brick-yard Supplies.

They have invariably become recognized leaders in every locality, invincible in the yards and in all contests, winning their way by fine work and lasting qualities and positive economy. They are up-to-date, progressive machines, with all the latest improvements. Well Built, Strong and Durable.

There have been more Potts Machines sold this season than ever before fully one-half of which have gone to yards to replace machines which were sold last season because they were "just as good" as the Potts, and cheaper.

Reese-Hammond Fire Brick Company.

Capital Stock $500,000. **Annual Capacity, 50,000,000.**

BOLIVAR, PA., June 26, 1900.

C. & A. POTTS & Co., Indianapolis, Ind.

Gentlemen:—We have your esteemed favor of the 22nd, in reply we are pleased to state that the reports we have received from your machine are most gratifying. From the reports of our superintendent the results are entirely satisfactory, and we can assure you that it gives us great pleasure to be able to make such a report to you.

Yours respectfully,
REESE-HAMMOND FIRE BRICK CO.

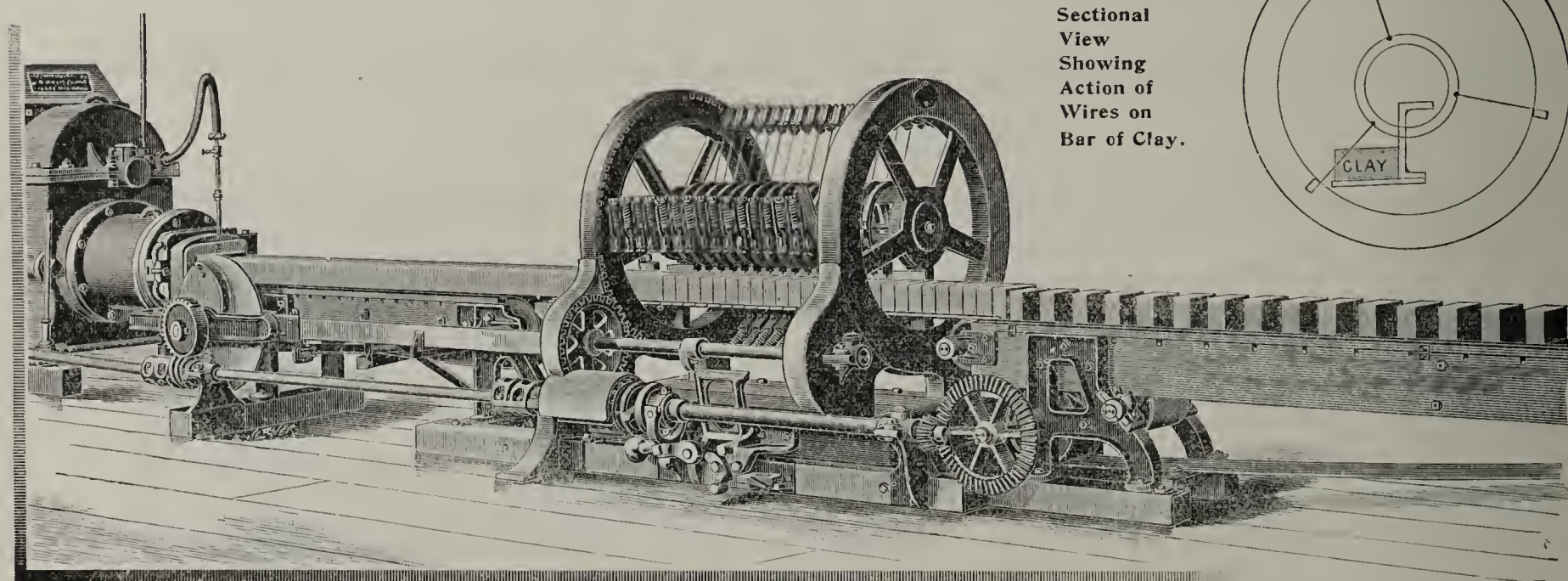
THE ABOVE LETTER IS FROM A VICTIM WHO TRIED ONE OF "THE JUST AS GOOD" MACHINES LAST SEASON. LET US TELL YOU WHY THEY MADE THE CHANGE.

C. & A. POTTS & CO.,

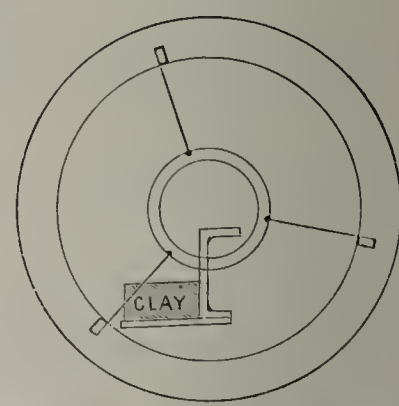
WRITE FOR OUR NEW CATALOGUE

INDIANAPOLIS, IND.

Merit Wins Success.



Sectional View Showing Action of Wires on Bar of Clay.



Don't Jump at Conclusions,

You Can Count on This Cutter.

As being entirely automatic and worthy of your consideration. It is driven direct and needs no auxiliary power or slip belts.

The cutting wires are short and have a downward shearing movement, which insures a clean, smooth cut.

Broken wires can easily be replaced without stopping the machine.

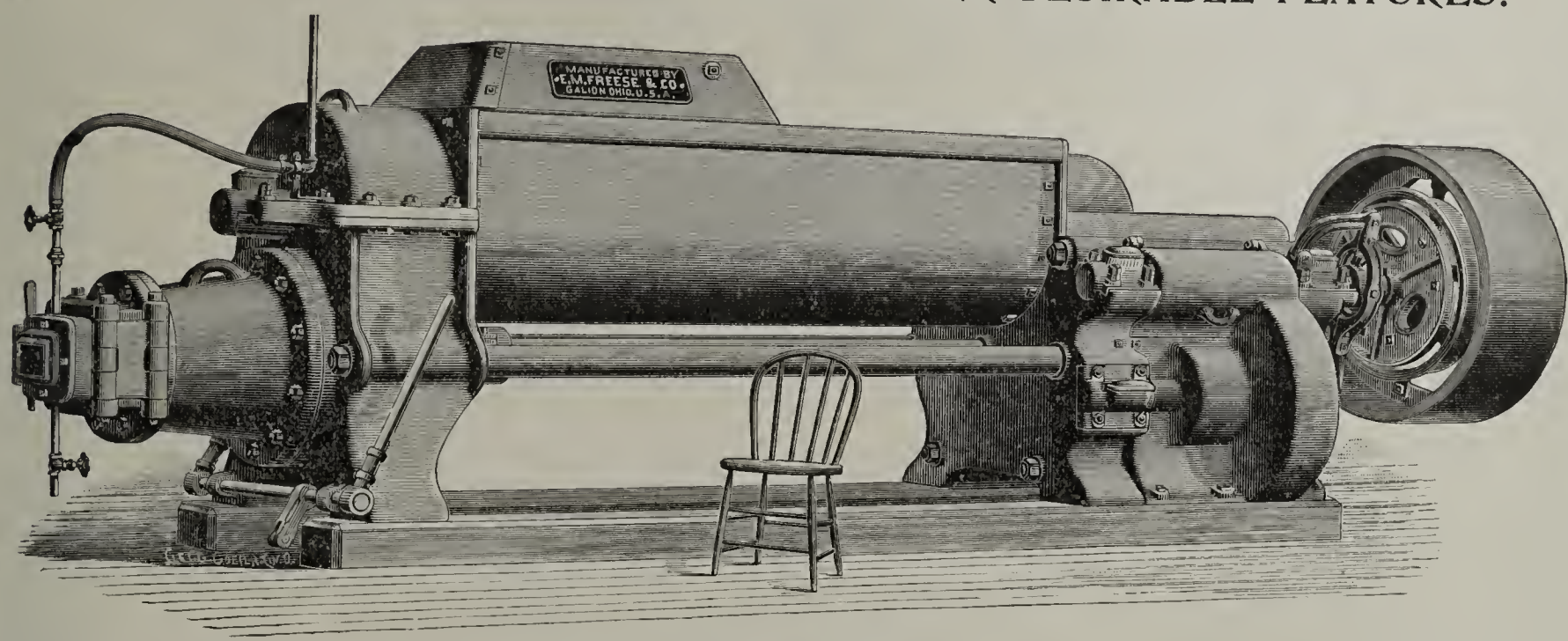
Your request for particulars is solicited.

E. M. FREESE & CO.,

Galion, Ohio.

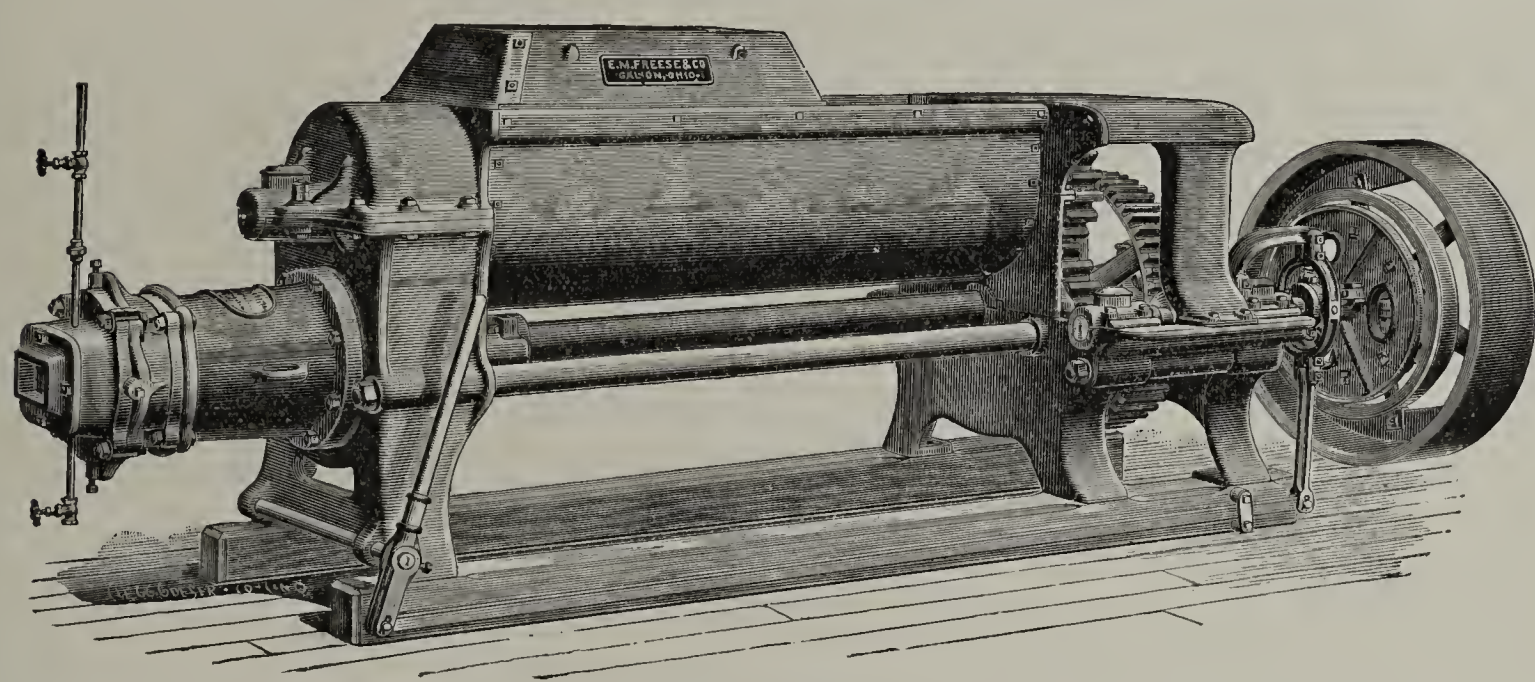
In This Union There is Strength,

AS WELL AS DURABILITY, CONVENIENCE, ECONOMY AND MANY OTHER DESIRABLE FEATURES.



SPECIAL SIZE.

Our UNION BRICK MACHINES have fairly EARNED their reputation for Excellence.



No. 1 SIZE.

BUILT IN FOUR SIZES. Daily Capacity 20,000 to 80,000.

WHAT ARE THE EASIEST THINGS in the World to make? Answer: Extravagant claims and a mistake in selecting a Brick Machine.

Those who bought our Machines made no mistake. They will tell you so. Among them are some of the most prominent brick manufacturers.

Write us for particulars.

E. M. FREESE & CO.,

Galion, Ohio.

Some of the Articles we Make

Horizontal ... Vertical Brick Machines

CLAY GRANULATORS,
PUG MILLS,
CLAY ELEVATORS,
CLAY CARS,
REVOLVING DUMP TABLES,
TEMPERED STEEL BRICK STRIKES,
KILN CASTINGS
AND OTHER CASTINGS.

Friction Winding Machines,
Friction Clutches,
Friction Clutch Pulleys,
Friction Cut-off Couplings.

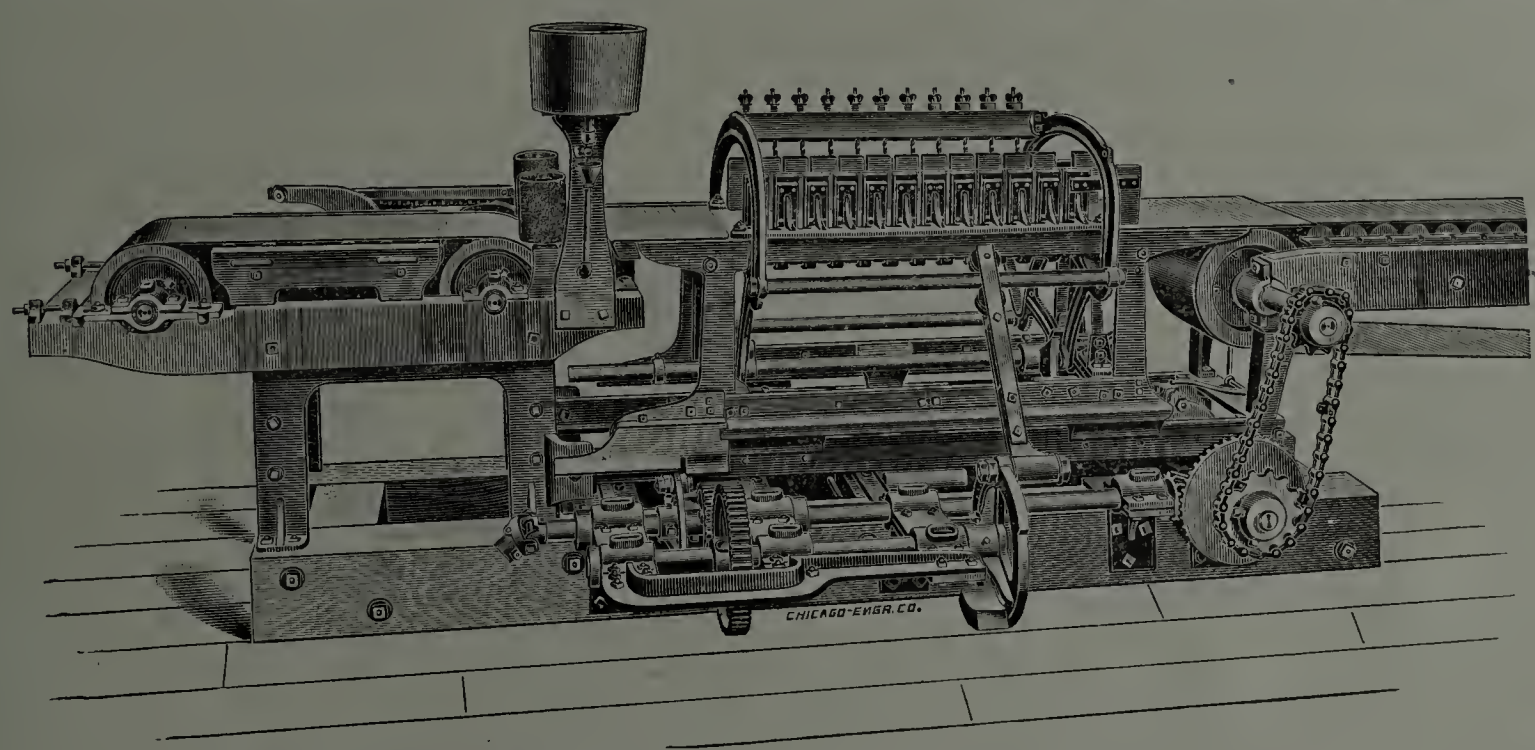
POWER FREIGHT ELEVATORS,
HOISTING MACHINES
AND SOME OTHER THINGS.

Have printed descriptive sheets describing many of these articles, which we will be happy to furnish, with prices on application. It's not our aim to build the cheapest but we do try to build the best. BETTER INVESTIGATE THEM.

The Eastern Machinery Co.,
NEW HAVEN, CONN.

CALL THE ROLL

Of all the Automatic brick cutters that you have ever seen. Enumerate in your mind all the Automatic brick cutting machinery of which you have read or heard descriptions. Review all the literature on the subject of Automatic brick cutters which you may have at hand or are able to obtain and determine how many machines of this kind are operated without either assisting belt or a measuring belt from which power is taken to do some work. You will find only one and that is this one. The one, in the operation of which, the column of clay does nothing but measure itself.

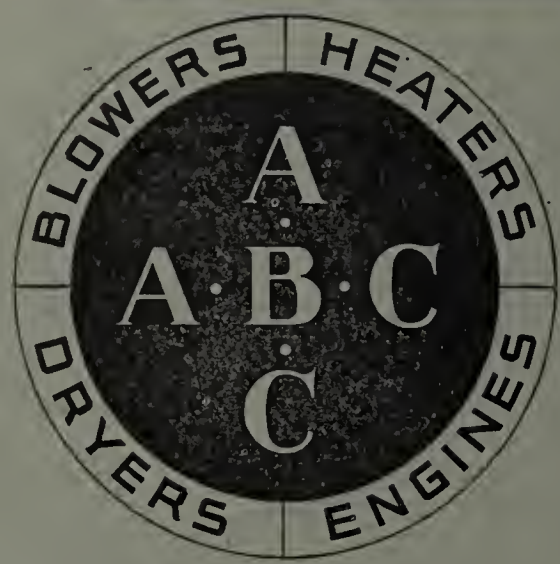


The BREWER No. 60 AUTOMATIC CUTTER.

Can you expect to get blood from a turnip? Can you lift yourself by your boot-straps? Can you expect to cut brick of a uniform thickness throughout any great period when you depend upon a column of plastic clay to do the pushing? One is as reasonable as the other. Investigate this point before you buy.

Catalogs and Information for the asking.

H. BREWER & CO., Tecumseh, Mich., U. S. A.



The Rome Brick Co., Rome, Ga., writes:

"Replying to your request under date of 26th ult. for a testimonial in regard to you system of drying brick, we cheerfully bear testimony to the fact that your apparatus installed about the first of April last is doing all that your company claimed for it.

During the interval mentioned, we have been hampered somewhat with insufficient boiler power, but this deficiency in no wise militated against the working of your drying system, only it did not give us the best results obtainable We : re now placing a boiler of 250 h. p. as against 150 h. p., and when we start up, we know positively that every claim which you advanced will be more than fulfilled.

We have been contemplating this method of drying our brick for several years, but until we investigated your plans, we were not satisfied of the perfect utility of the tunnel system advocated by other companies, but we would not change back for twice the cost of your dryer to our former way of drying brick. The cost test we have not fully tried, but later if you desire figures on this line, we will gladly furnish them."

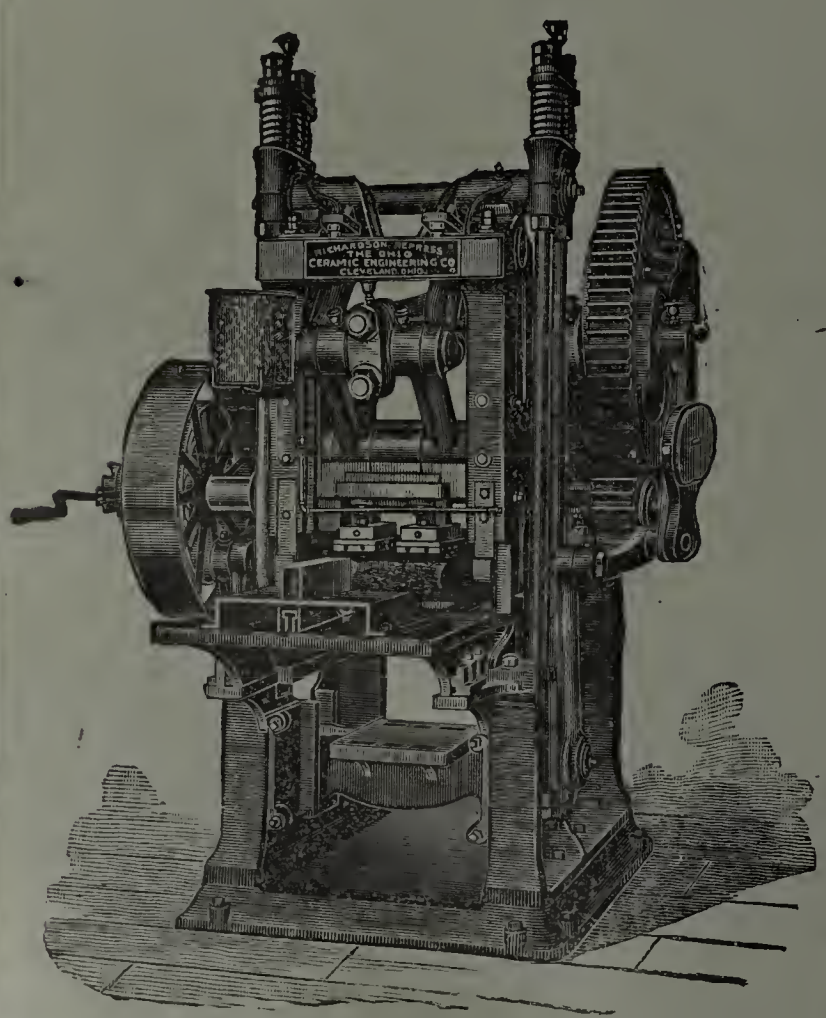
American Blower Company,
Detroit, Michigan.
New York. Chicago. London.

A FEW COLD FACTS.

WE HAVE from time to time during the years we have been in business made many changes in the construction of our Sewer Pipe Press. Each time these changes have created among other manufacturers a strong protest of—**no good—it won't work,** and yet in a short time they were all trying to attain the same end. They copy **the best** because it is ahead in the procession. This fact alone should convince you that the **Vaughn Press** is up-to-date. Do you want the best Press or do you want to stay in a rut and use Grandfather's method? Better have a talk with us and make money.

The Turner, Vaughn & Taylor Co.,
CUYAHOGA FALLS,
OHIO, U. S. A.

DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



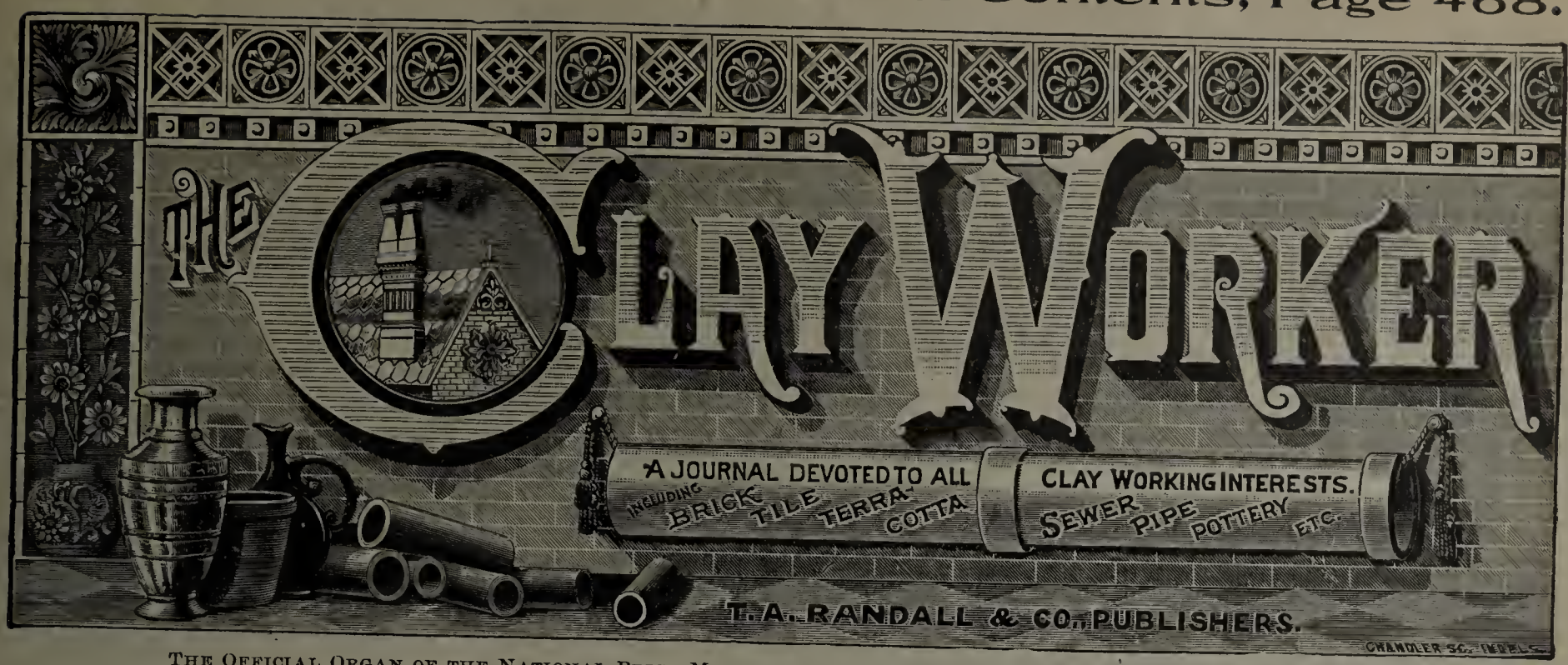
The RICHARDSON REPRESS.

IF YOU GIVE THEM A CHANCE, OUR REPRESSES AND OTHER MACHINES WILL SPEAK FOR THEMSELVES AND FOR US. SEND FOR CATALOGUE.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

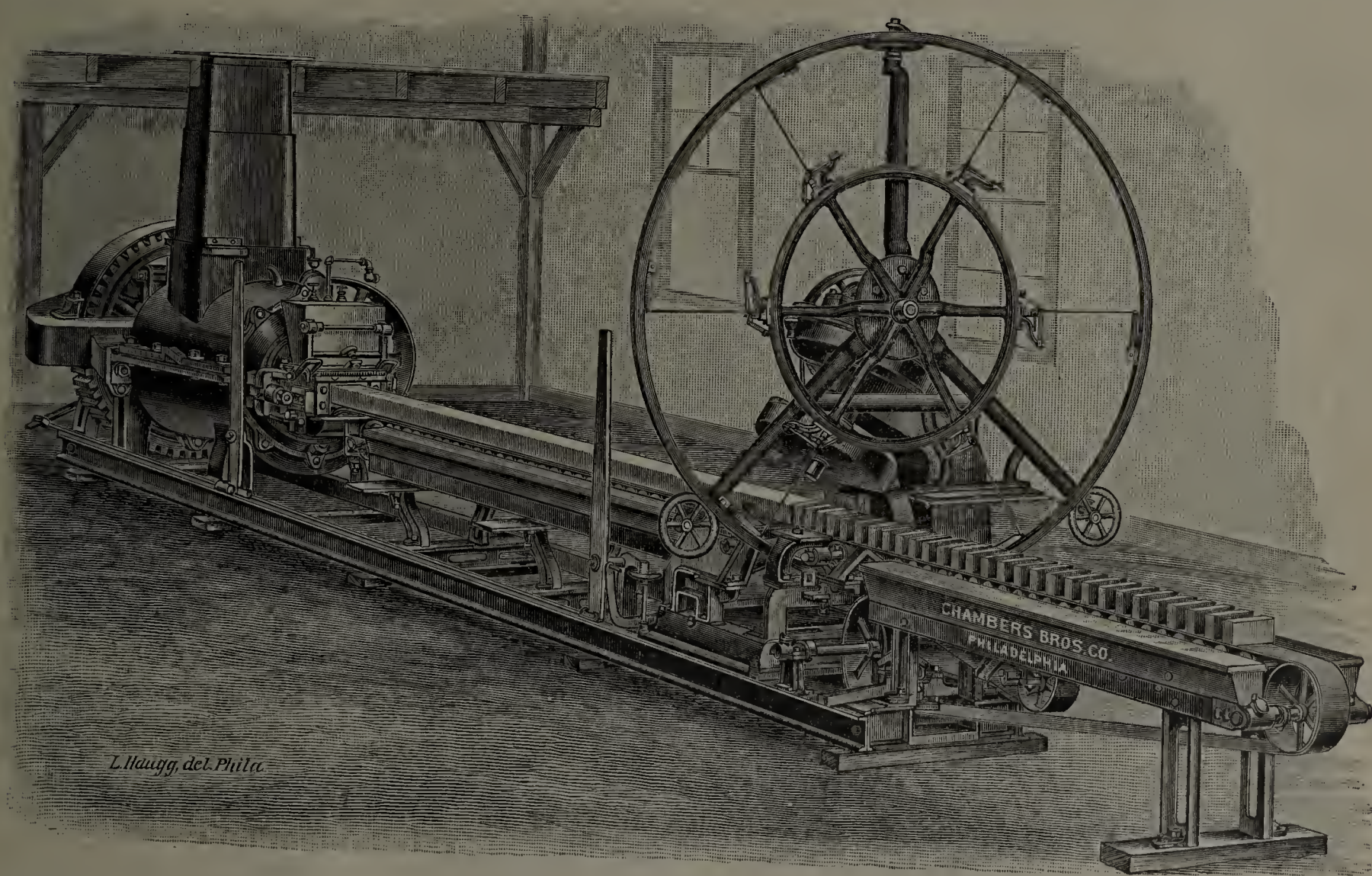
Table of Contents, Page 468.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIV, No. 6. INDIANAPOLIS, IND. DECEMBER, 1900. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

PHILADELPHIA, PA.

J. E. EASTES, Chicago Agent,
171 South Canal Street.

The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

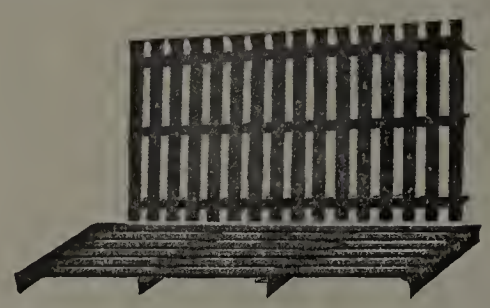
We are the Largest Manufacturers of Dryer Cars in the World.

Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.

No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.

No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet 7 inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name. Page.

American Clay-Working Mach Co, The. 472, 473, 500, 505
Anderson Foundry and Mach. Works 424
Chicago Brick Machinery Co.. 481
Chisholm, Boyd & White Co... 525
Fernholtz Brick Machinery Co. The 429
Progress Press Brick and Machine Co..... 481
Ross-Keller Brick Machine Co 426
Simpson Manufacturing Company The..... 428

Brick and Tile Machinery.

American Clay-Working Mach Co., The 472, 473, 500 505
Anderson Foundry and Mach. Works..... 496
Baird and Son, H. C..... 485
Battenfeld Mfg. Co, The 479
Brewer. H. & Co..... 511
Chambers Brothers Co..... 421
Chicago Brick Machinery Co... 481
Eastern Machinery Co, The.... 510
Fate & Co., The J. D..... 506
Freese, E. M. & Co.....508, 509
Henry Martin Brick Mach. Mfg Co, The 499
Hensley, J. W..... 423
Horton Mfg Co, The 501
Kells Foundry and Machine Co..... 485
Leader Mfg. Co, The..... 497
Madden & Co..... 484
Ohio Ceramic Engineering Co., The..... 512
Potts & Co., C. & A.....502, 503
Raymond Co., The C. W..... 469
Stedman Foundry and Machine Works..... 429
Steele, J. C., & Sons..... 495
Wallace Mfg. Co, The..... 507
Wellington Machine Co, The... 471
Wiles Co., A. M. & W. H 495

Brick Kilns and Dryers.

Alsip, S. H 489
American Blower Co, The..... 512
Barron, A. F 492
Bushong, M. M 493
Crown Dryer Co., The..... 498
Eudaly, W. A 493
Haigh, H 492
Illinois Supply and Construction Co, The..... 427
Justice, I. M..... 482
Morrison & Co., R. B 484
New York Blower Co., The.... 486
Phillips, S. G..... 489
Pike, E. M..... 489
Reppell, L. H 492
Swift, F. E 492
Standard Dry Kiln Co, The..... 430
Yates, Alfred..... 485

Brick Yard Supplies.

Atlas Bolt & Screw Co, The..... 422
Arnold, D. J. C..... 496
Borden & Selleck Co 483
Buhl Malleable Company..... 482
Cleveland Car Co..... 488
Caldwell & Son Co., H. W..... 487
Carmichael, T. W..... 494
Carnell, Geo..... 495
Cox, Geo. S..... 485
Elder & Dunlap..... 486
Frost Engine Co..... 504
Harrington & King Perforating Co, The..... 423
Henry Martin Brick Machine Mfg. Co, The..... 499
Horton Mfg. Co, The..... 501
Jeffrey Manufacturing Co, The. 487
Kendall & Flick..... 482
Koppel, Arthur..... 512
Marion Steam Shovel Co..... 497
Main Belting Co 483
Mershon & Co., W. B 485
Newton, A. H..... 487
Newton A. C..... 484
Phillips & McLaren 484
Rockwood Mfg. Co, The..... 483
Smidth & Co., F. L..... 494
Turner, Vaughn & Taylor Co... 420
Vanduzen Co., The E. W 487
Wells & Hall..... 487
Williams Patent Crusher and Pulverizer Co 475

Miscellaneous.

Baird & Co., Henry Carey 485
Burt Manufacturing Co..... 468
Chesapeake & Ohio R. R....477, 488
Clinton Paving and Building Brick Co., The..... 490
Coaldale Brick & Tile Co., The . 491
Dean Bros. Steam Pump Works 486
Eastern Paving Brick Co..... 491
Engelhard, Charles 487
Evans & Co., Victor J..... 488
Evens & Howard 483
Gabriel & Schall..... 487
Green & Hunter Brick Co 491
Harper-Norton Shale Brick Co The..... 491
Indianapolis Engraving and Electro Co..... 485, 487
Indiana, Decatur & Western ... 489
Lake Erie & Western..... 489
Laughlin Mfg. Co..... 486
McAvoy Vitrified Brick Co 490
Miller Oil and Supply Co 488
Munn & Co..... 489
Merchants & Miners Transi Co.. 480
New York Brick and Paving Co 491
Osborne, W. R..... 486
Old Dominion Line..... 482
Preston Brick Co..... 490
Pennsylvania Line 488
Purington Paving Brick Co, The 490
Ripans Chemical Co..... 488
Terre Haute Brick and Pipe Co. 490
Vandalia Line..... 488
Wabash Clay Co., The..... 490
Ads., Small Wanted, For Sale, etc.

For Chute or Gravity Screens.

For Shaking or Vibrating Screens.

For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

For Revolving Screens.

For Dry Pan Screens.

PERFORATED STEEL FOR CLAY SCREENS.

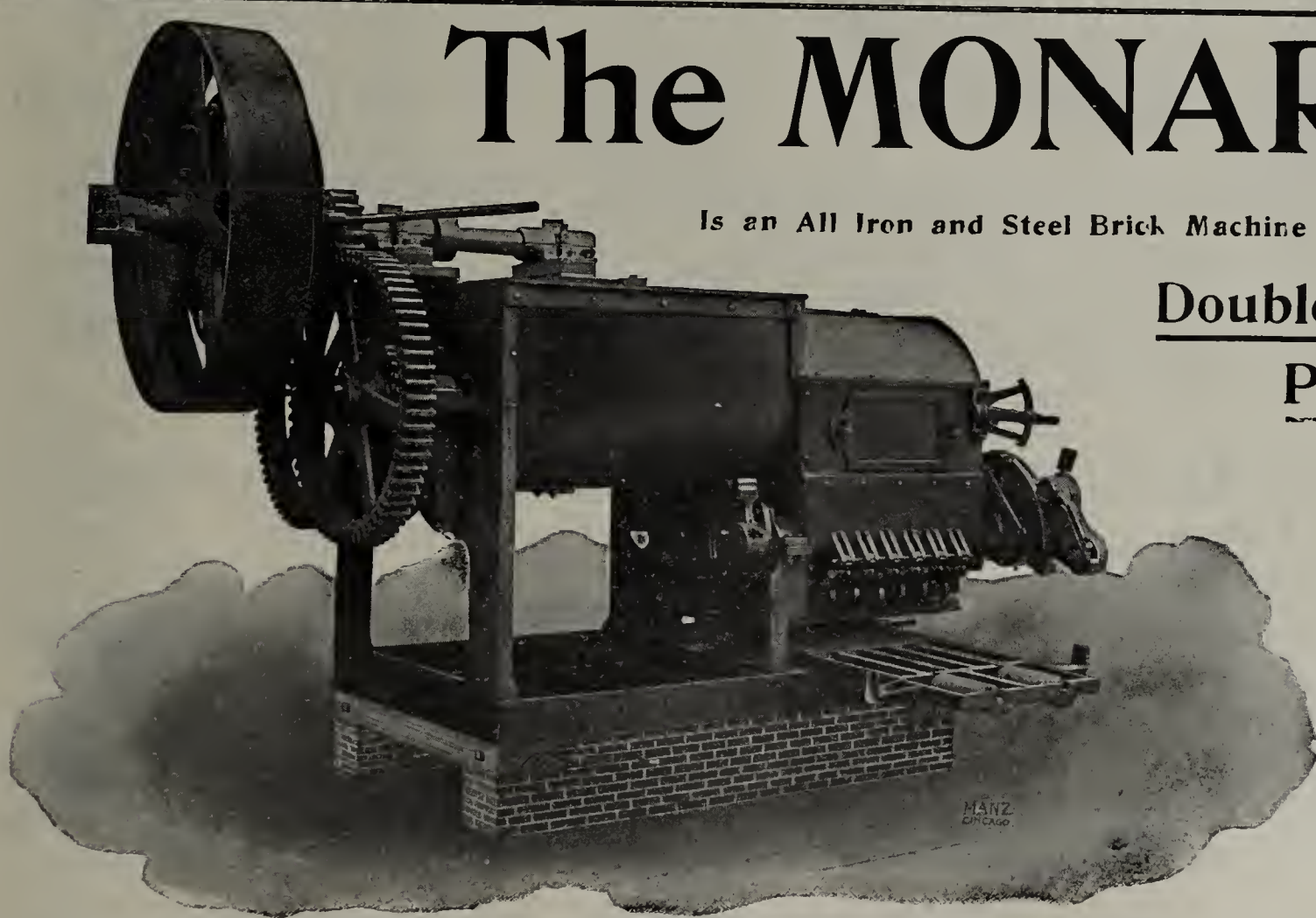
Samples or blue prints with prices furnished on request.

THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street, CHICAGO, ILL., U. S. A.

The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.



SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for new 1900 Catalogue.

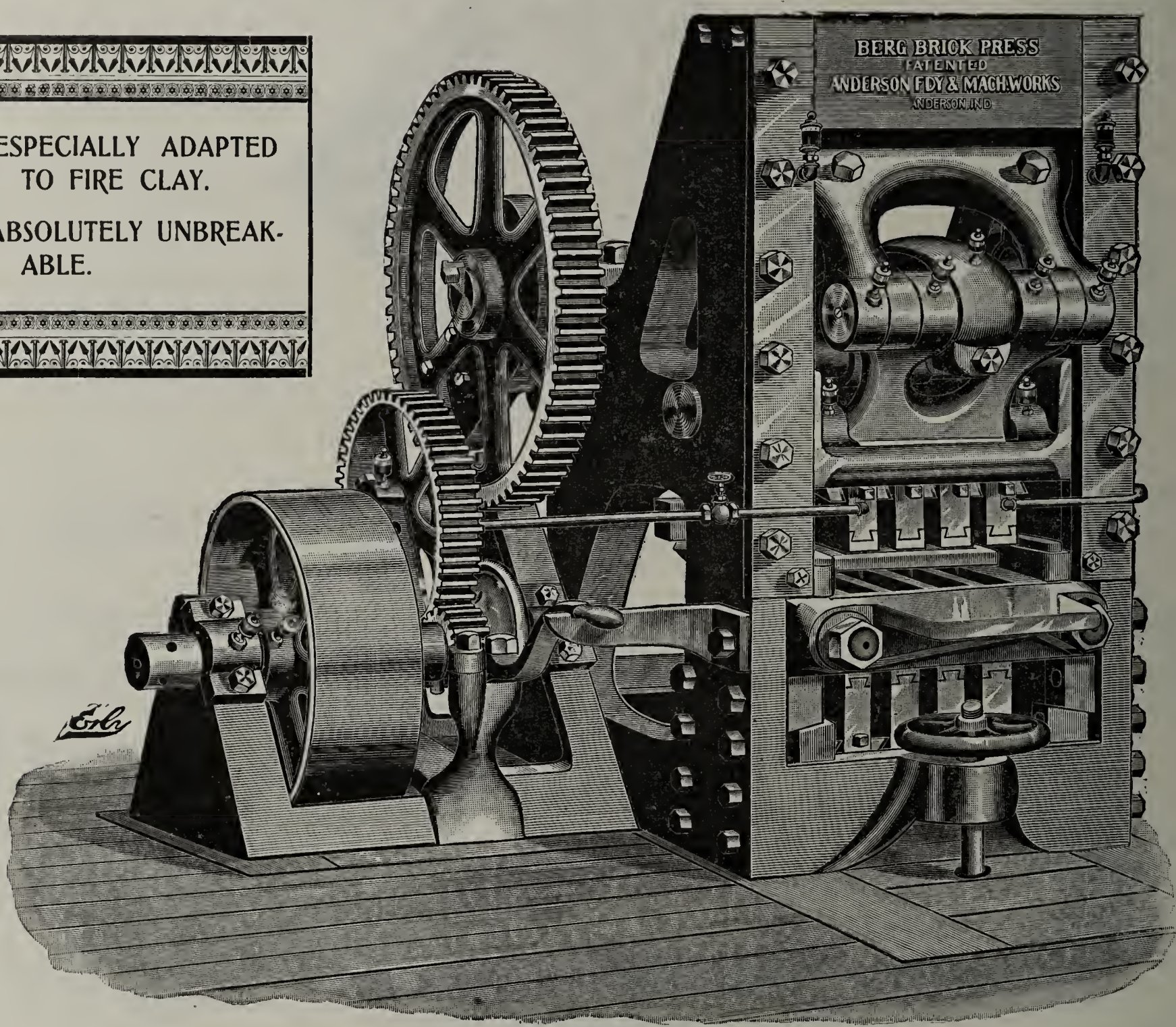
JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

MANUFACTURED BY

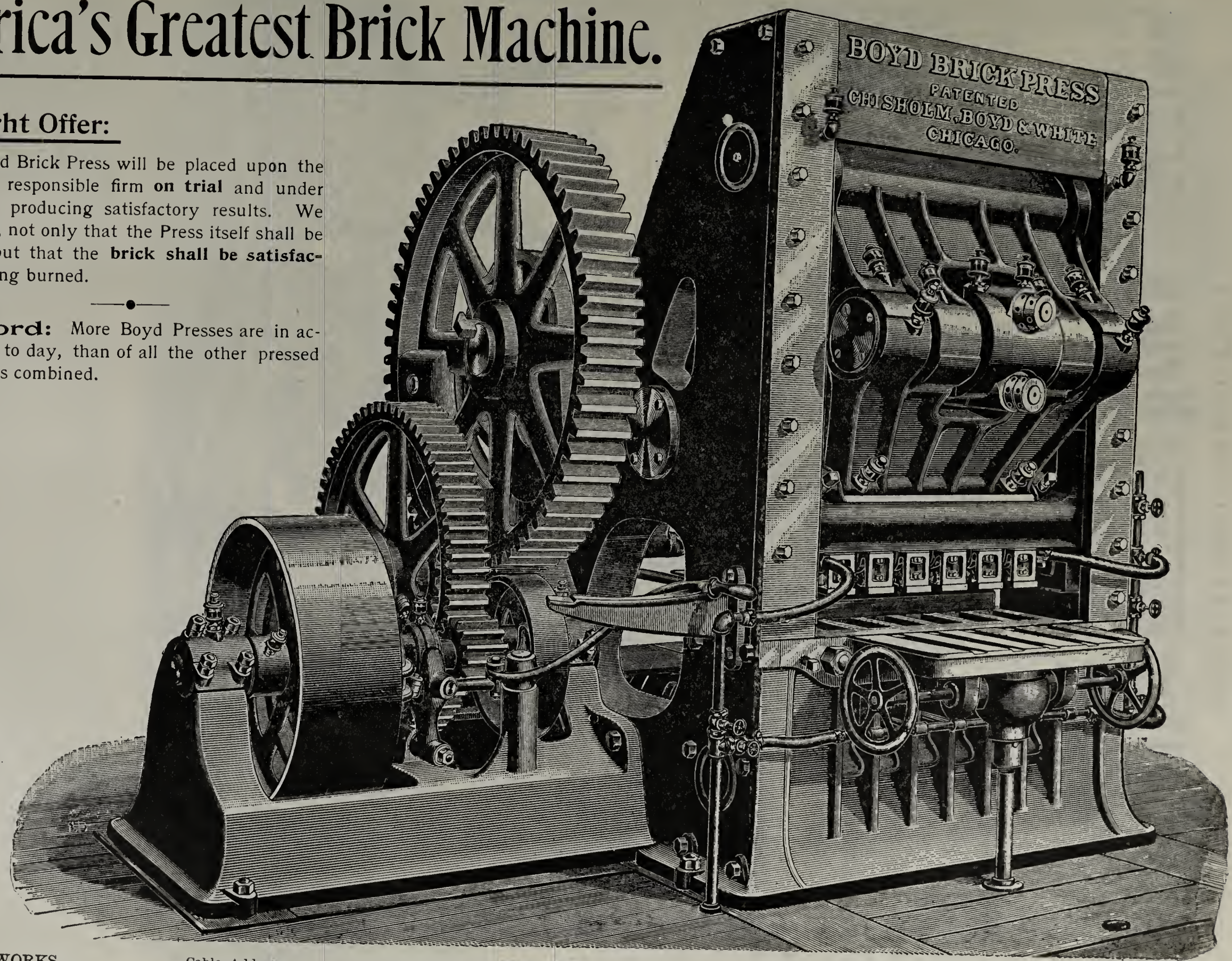
The Anderson Foundry & Machine Works,
Anderson, Indiana.

America's Greatest Brick Machine.

A Straight Offer:

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets.

Cable Address:
"CHISHOLM, CHICAGO"
A. B. C. Code Used.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The LATEST IMPROVED

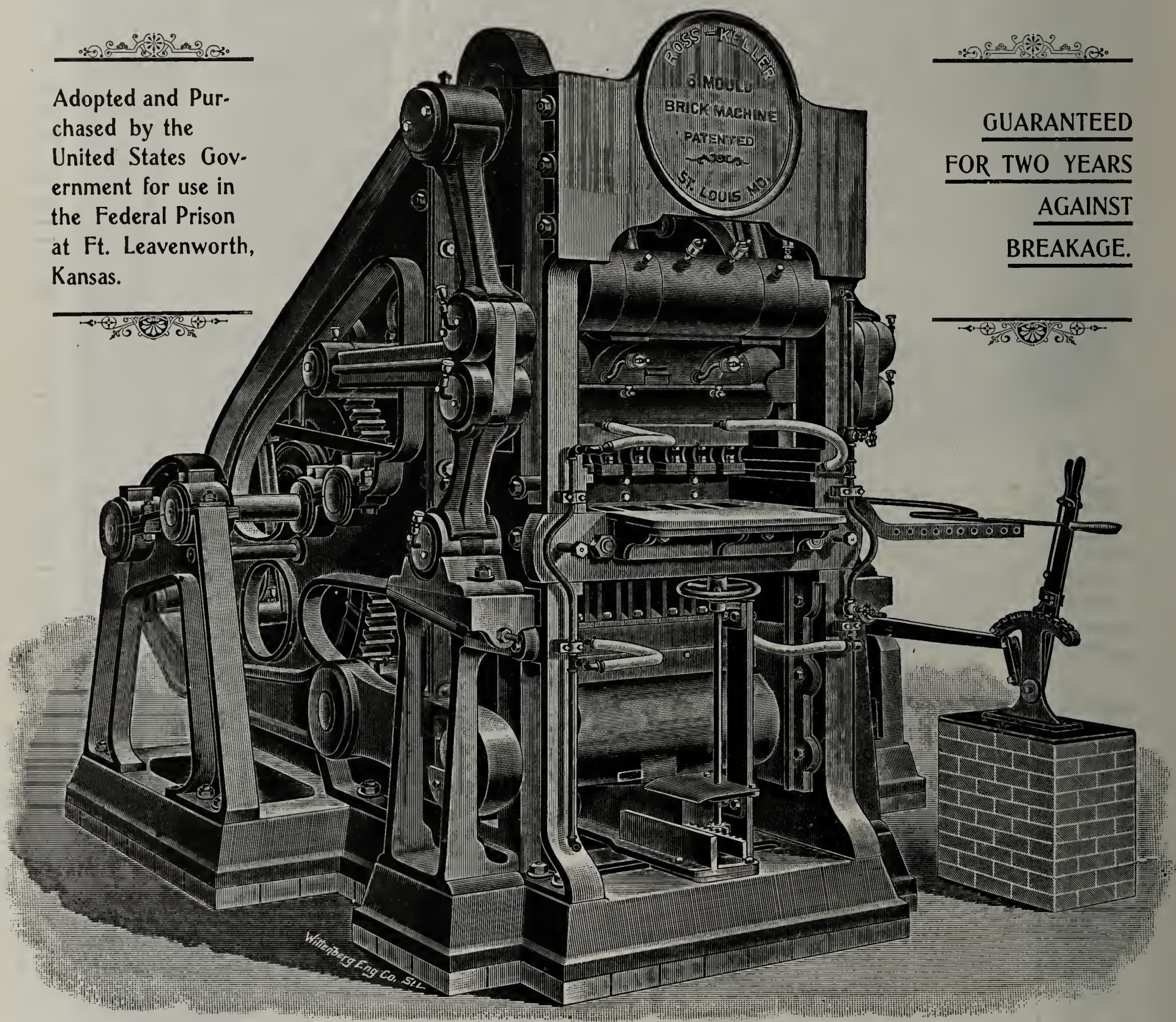
Ross-Keller TRIPLE PRESSURE Brick Machine

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 35,000 to 40,000 brick per day.

BRICK SET IN KILN DIRECT FROM MACHINE.

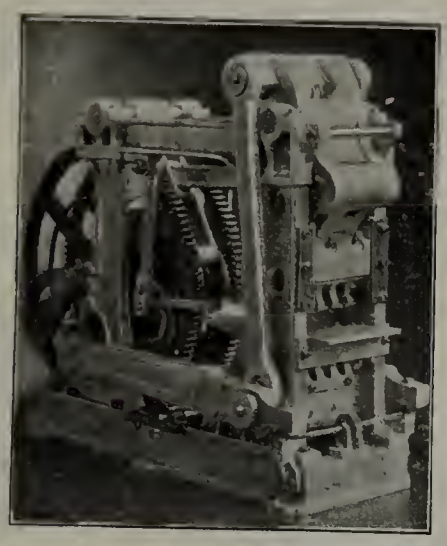
Adopted and Purchased by the United States Government for use in the Federal Prison at Ft. Leavenworth, Kansas.

GUARANTEED FOR TWO YEARS AGAINST BREAKAGE.



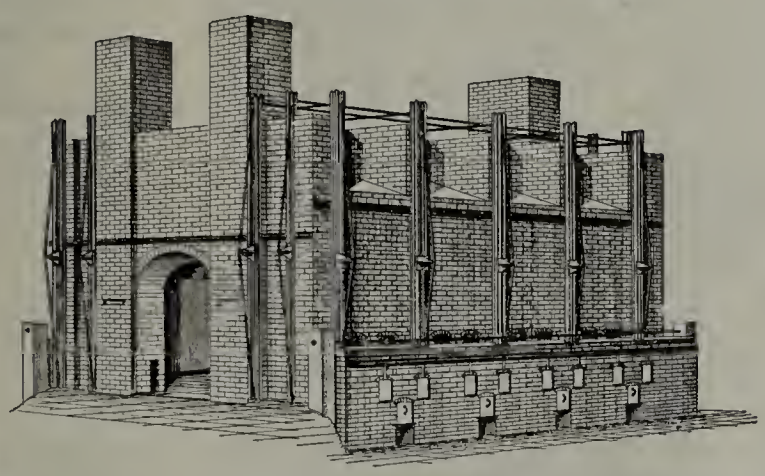
THIS machine has an unbroken record of success. It is used on a number of the best equipped brick plants in the United States. It has never failed to give entire satisfaction and we are perfectly safe in guaranteeing that it will work any clay of which pressed brick can be made, and make them better and cheaper than any other press. It makes better brick because the pressure is greater and is applied in a way most effective. It makes brick cheaper because it is unbreakable and hence there are no repair bills or expensive delays and stopping of work which brickmakers know are more costly than the repair bills themselves. If you want to make the best brick at the least expense the season through don't fail to investigate this machine, with it you can "put money in your purse." Let us tell you more about it and give the address of those now using it. Remember "the proof of the pudding is in the eating of it."

For Prices and Full Particulars, address **ROSS-KELLER BRICK MACHINE CO.,** 915 and 916 Holland Bldg. ST. LOUIS, MO., U. S. A.



The GRATH DRY CLAY BRICK PRESS.

THE LATEST, BEST AND CHEAPEST.
THE SIMPLEST, MOST POWERFUL
AND DURABLE BRICK PRESS.

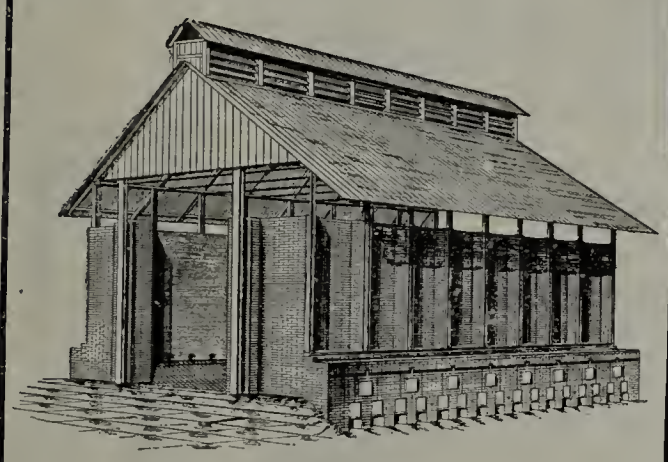


Features:

1st. Less Parts.
2d. No Side Strain.
3d. Power Increases as the Resistance Increases.
4th. Requires less power to Operate.
5th. Brick free from Granulation.
6th. All Bearings Bushed.
7th. All parts Accessible.
8th. Thickness of Brick Changed without Stopping.
9th. Master Wheels Close to Bearings.
10th. No Working parts under Lower Cross Head.

The GRATH Combined Radiating Floor and Direct Down-Draft Kiln,

WITH GRATH GAS AND COKING FURNACES ATTACHED Built Round, Square and Continuous. Perfect results guaranteed. No soft, overburned or flashed brick, uniform throughout.

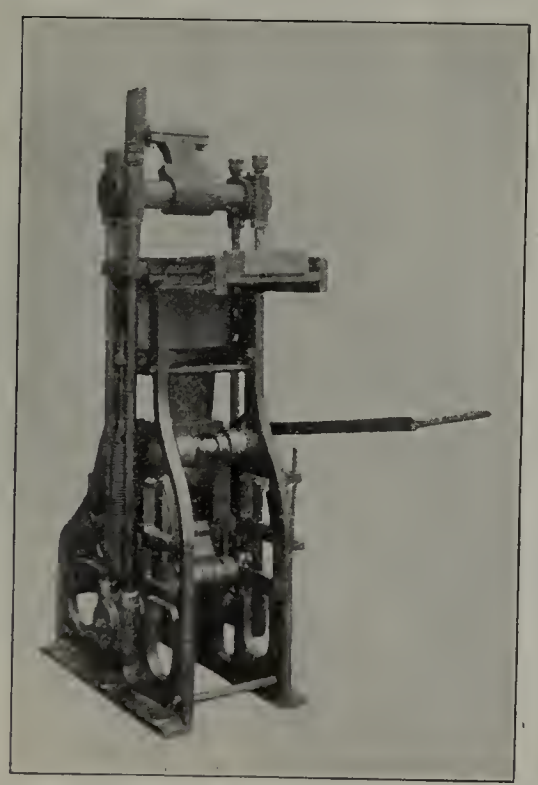


The Grath Up-Draft Kiln.

WITH GRATH GAS AND COKING FURNACES ATTACHED for burning large quantities of Common Brick with slack coal, with better results than lump coal in ordinary Furnaces and without any black Smoke.

The Grath Gas and Coking Furnaces

Can be attached to ALL kinds of Kilns, either old or new, and produce better results with SLACK than lump coal in ordinary furnaces. PROTECTION GUARANTEED TO ALL USERS. WILL PROSECUTE ALL INFRINGEMENTS.



The Grath Dry or Semi-Dry Clay Hand-Power Press

FOR PLAIN OR ORNAMENTAL PRESS BRICK. The only successful Press of its kind in the market.

SIMPLE, DURABLE AND POWERFUL.
NO BRICKYARD COMPLETE WITHOUT THIS PRESS.

Two men can make from 800 to 2,000 fine Press Brick per day, depending upon size and shape made.

REFERENCES. (For Hand Press.)

Coffeyville (Kansas) Vitrified Brick and Tile Co.
Columbus (Ohio) Face Brick Co.
Hanover Press Brick Co., Columbus, Ohio.
T. L. Myers, Los Angeles, Cal.
Otto Marstrandt, Vancouver, B. C.
The Arkansas Brick Co., Lester, Ark.
The Sunset Brick and Tile Co., Gonzales, Texas.
E. Danal, Shawnee, O. T.
Quincy Press Brick Co. Quincy, Ill.

For Further Information and Catalogue on Above, address

The Illinois Supply & Construction Co., ST. LOUIS, MO., U. S. A.

Mention The CLAY-WORKER.

Invariable Report

Of Our Travelling Men—

VENI—I Came,
VIDI—I Saw,
VICI—I Conquered.

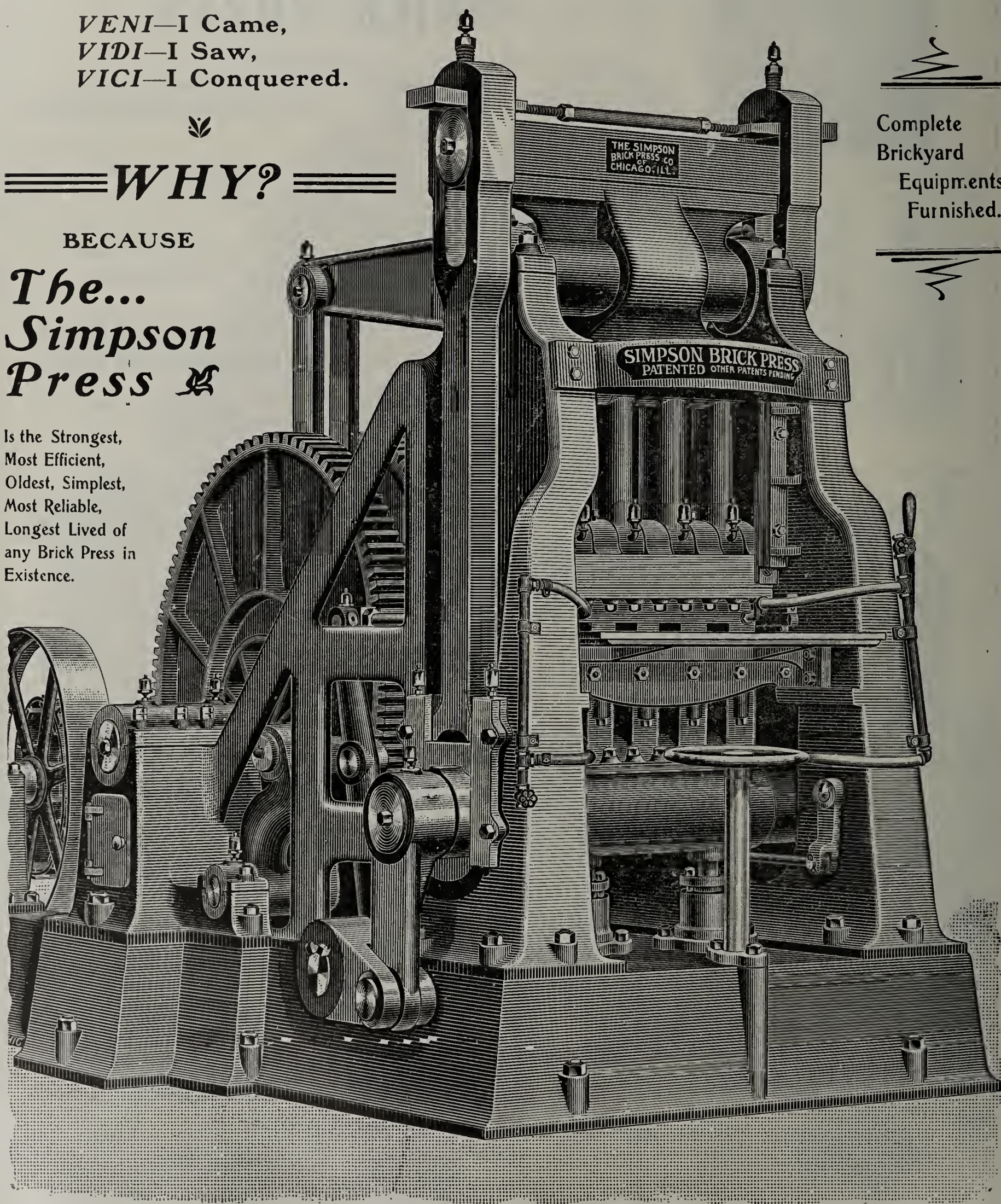
WHY?

BECAUSE

The... Simpson Press

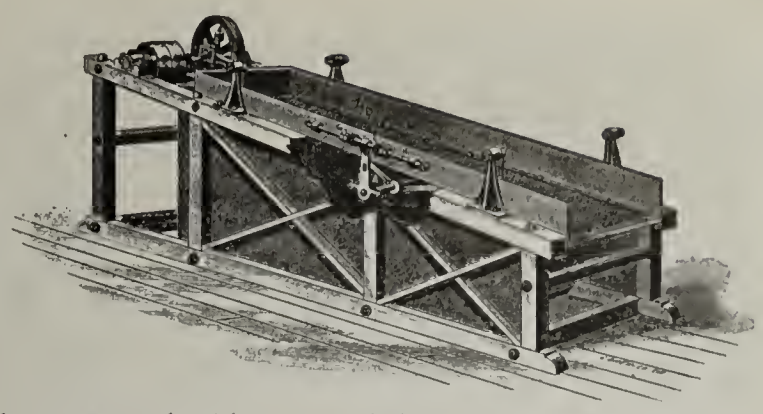
Is the Strongest,
Most Efficient,
Oldest, Simplest,
Most Reliable,
Longest Lived of
any Brick Press in
Existence.

Complete
Brickyard
Equipments
Furnished.



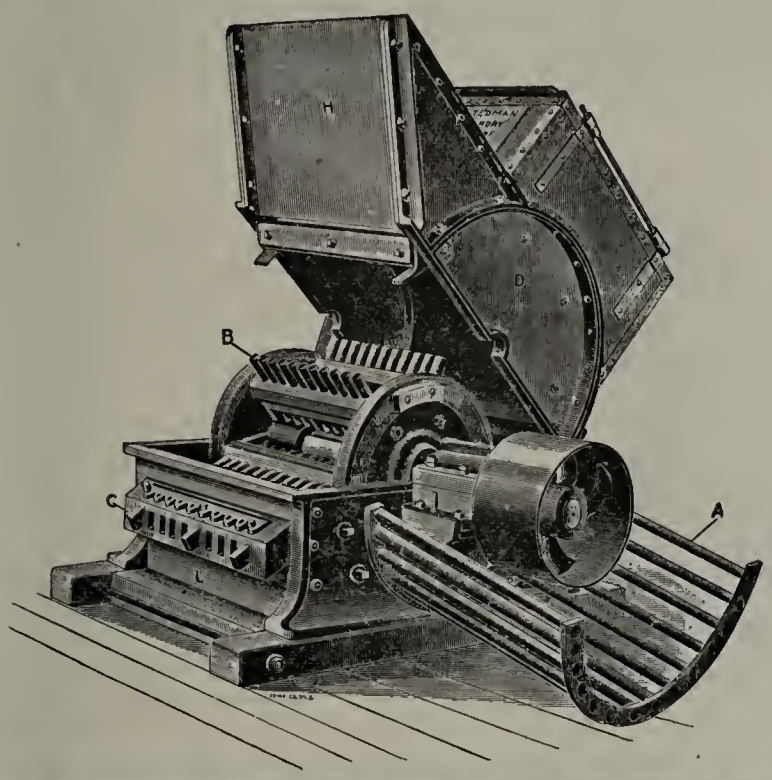
Apply for Catalogue to **The Simpson Manufacturing Co.,** WINTHROP HARBOR, ILL.
CHICAGO OFFICE:--95 Dearborn Street.

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.



A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel.



STEDMAN'S CYCLONE CLAY PULVERIZER.

For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

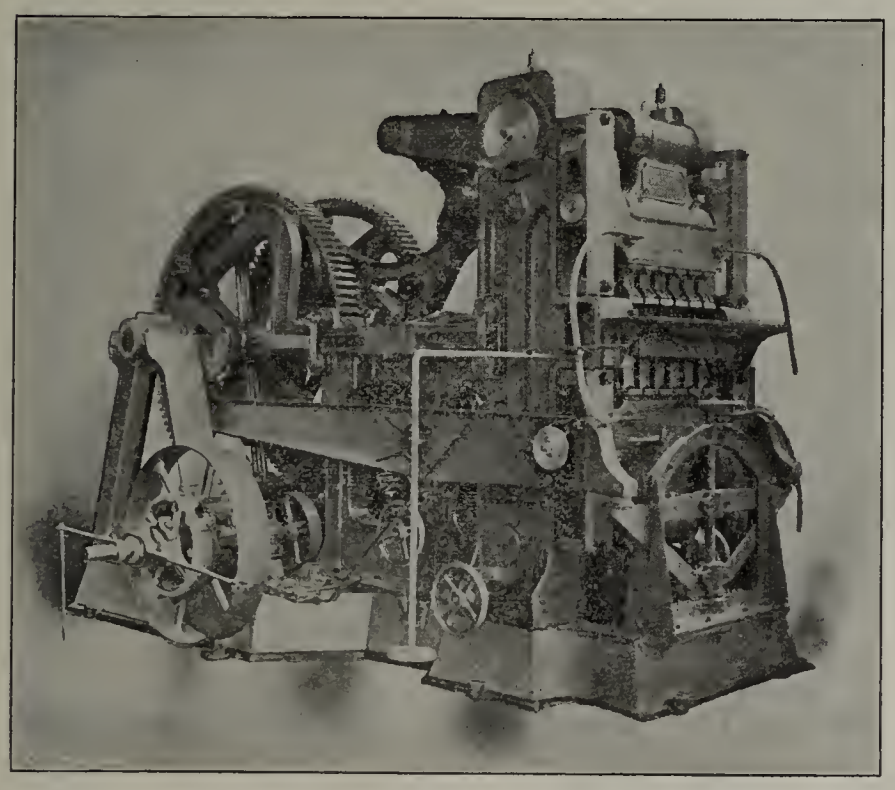
Write for catalogue, giving full description, references and testimonials.

Stedman Foundry and Machine Works,

Aurora, Indiana.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, SIMPLICITY and SERVICE.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market.

All parts subject to strain are made of the best Bessemer steel.

Fitted with the Fernholtz Mold Box. Undoubtedly the leader.

We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer,** in our own factory.

Dealers in Brickyard Supplies.

THE FERNHOLTZ BRICK MACHINERY CO., St. Louis, Mo.

Gentlemen:—In reply to your letter, as regards your Dry Press Brick Machine, I have had one in use in Houston, a Four-Mold, for nearly three years. I am entirely satisfied with it. As to repairs, I have not had any, and now having decided to put in a Dry Press in my Austin Plant, as you are aware, I have bought of you, another four-mold Fernholtz Dry Press, Pulverizer and Mixer. I take pleasure in recommending your machine and Company. Respectfully yours, M. BUTLER.

Further Information on Application.

The Fernholtz Brick Machinery Co.,

CABLE ADDRESS "FERNBRICK." WESTERN UNION CODE.

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

THE STANDARD

IS RELIABLE.

The Standard Brick Drier,

Will dry perfectly, all kinds of clay products; will do its work quickly and economically, and give perfect satisfaction in every respect. This we **guarantee** it to do.

We Plan, Build and Equip Complete Drying Plants of any Capacity.

We shall be pleased to answer all inquiries, and explain any Drier points about which you are in doubt. Write for Catalog No. 50 and testimonials.

The Standard Dry Kiln Co.,

INDIANAPOLIS, INDIANA.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXIII. INDIANAPOLIS, IND., DECEMBER, 1900. No. 6.

Written for THE CLAY-WORKER.

CLAY FROM TOP TO BOTTOM.

A Brick and Terra Cotta Office Building.

IT IS WITH much pleasure we have noted the two articles in the October and November numbers of The Clay-Worker referring to the office buildings of the Purington Brick Company and the American Terra Cotta Company.

With customary modesty, well known to Easterners, we hesitate to approach the question of office buildings used by the craft. We note the building of the Purington Company has stone trimmings and that of the American Company has an iron roof, and while both buildings are certainly well proportioned and admirably adapted to their particular uses, we cannot allow the opportunity to pass without placing before the readers of The Clay-Worker the office building of the Brick, Terra Cotta & Supply Company, M. E. Gregory, proprietor, Corning, N. Y. The exterior of this building is made completely of burned clay, all of which is the product of the plant. The building is built on the lines of the German renaissance and erected in accordance with plans made by the superintendent of terra cotta department. The foundation walls of this building are built of paving brick; first story of dark gray mottled brick, with trimmings of mottled terra cotta, while the second story is faced with buff brick with similar trimmings, and the roof is covered with red roofing tile. Hence, without boasting, this building goes Brother Purington and Brother Gates "one better." The lower floor contains the offices of the different departments, which are finished in the natural wood with terra cotta and face brick fireplaces. The second floor is utilized as the draughting department, but on account of the constant growth of the business the office is too small and plans are now being made for an addition. The growth of this business during the last five years is quite phenomenal, for at that time, while the old company was turning out large quantities of brick, which were mostly used locally, and a little terra cotta, the product of two or three kilns,

Factory Office of the Brick, Terra Cotta and Supply Co., Corning. N. Y.

at present time there are seven brick kilns and nine terra cotta kilns and additions proportionally in all departments, and the product of the plant is now favorably known to the trade and finds a ready market. During the last two years the architectual terra cotta for eight large school buildings in New York have been turned out by this company and many more prominent buildings throughout the East. At the present time the terra cotta department is running thirteen hours per day, with sufficient work ahead for all winter. Among the orders on hand might be mentioned a dormitory building for Columbia College, of which Bruce Price is the architect.

Written for THE CLAY-WORKER.

THAT CLAY BANK.

By L. C. Moore.

THE IMPORTANCE OF selecting a bank of clay with the greatest care and foresight becomes more and more apparent as one grows older in the clay business, and gradually exhausts the supply which he had thought sufficient to last a lifetime. One of my friends who manufactures axe handles on a large scale, and who now finds the supply of hickory timber rapidly disappearing, said to me: "What happy fellows you brickmakers ought to be, with your unlimited quantities of raw materials. If I could only step just outside of my factory and pick up hickory logs it would not take me long to be able to retire from business with plenty laid aside for old age."

But he knew more about hickory timber than about clay, and had no idea of the trials and tribulations of the brickmaker on account of that clay bank. There are so many things to be taken into consideration in the selection of the supply of raw materials—quality, proximity to the factory, drainage, impurities and foreign substances—and all these points must be carefully taken into account before one plans his factory or purchases his machinery.

Of course the subject of market for ones output comes before all else, but I do not wish to discuss that here. I want to presuppose that there is a market for ones product, and fuel to be obtained at reasonable figures, and simply to deal with the clay bank and handling the clay, and to present some points that are suggested from our own experience.

It seems strange to us now that we should have erected a factory to utilize our original clay bank. While it proved excellent material, it lasted but three years, and then we had to change everything to suit a new clay bank on the opposite side of the factory. We had always thought this clay unfit for the manufacture of bricks, but necessity compelled us to use it for want of something better. It proved all right in the long run, but we suffered considerable loss of time and capital in refitting our machinery and sheds to suit the location of the new clay bank, and made several failures in drying and burning before we learned to handle the new clay. This new clay proved our salvation, but suppose it had been worthless, as we at first thought, there would have been one more failure to report, and all because of the lack of proper foresight.

The majority of men do not look far enough ahead in order that they might solve many problems before they crowd themselves into one's busiest work days. But proper forethought would prevent the greater part of these problems ever appearing. There are enough unforeseen events that are sure to come to the surface as we progress with our work, even after the most careful planning, and the most matured experience has exhausted its ingenuity.

We shall attempt no scientific classification of clay deposits, but speak only of those with which our experience has made us familiar, viz., the great variety of surface clays that vary with every few feet of depth, and often several distinct varieties of clays appear within a radius of 100 feet. All of these clays are more or less impure, and many foreign substances are intermixed for the apparent purpose of keeping the brickmaker thinking. Sometimes it is limestone pebbles, sometimes sulphur, sometimes small stones and pockets of coarse gravel, and we have sometimes found drifts of bituminous substances that gave no end of trouble. We draw the clay from the bank to the mill in dump cars with winding drum and cable. The track for the car accidentally formed a dividing line between two very distinct arrangements of clay in the bank of which we were ignorant until the spade revealed their peculiarities. The clay on the south side of the track being very sandy and lean, and varying but little from top to bottom, a depth of about fifteen feet. The bank on the north is composed of five different strata. First, a coarse, gray, sandy clay, with occasional pockets of gravel; second, a black clay, very

Majolica Work made at Sevres, France.

stiff and stubborn, and containing not a trace of sand in its composition; third, a gray clay, very fine and plastic, free from sand, but not nearly so stubborn as the black; fourth, a very pliable, smooth, yellow clay, also free from sand. The clay on the south side of the track is too lean or sandy to make first-class bricks, as is also the first layer on the north. The three lowest strata on the north are so smooth that used singly or all together make a brick on our auger machine that laminates badly and checks in drying to such an extent that we never attempt to use them without a mixture of the leaner clays from the other parts of the bank. From long experience we have learned the proper proportion of fat clay and lean to give the best results. If we chance to get too great a proportion of the lean the bricks are tender and break quite easily. But if we get too much of the fat clays the bricks laminate, are very difficult to dry, and have a greater shrinkage in

burning, so that great care has to be exercised to get the required mixture.

But our troubles do not end here. The black clay is so stiff when taken from the bank that it is almost impossible to get it thoroughly intermixed with the leaner and softer clays. When the side cut bricks are examined on the cut surface, instead of presenting a homogeneous appearance, one can see a streak of lean and a streak of fat, showing that the pugging has not been sufficient to thoroughly mix the different clays. Then when the bricks begin to dry there is a difference in the shrinkage of its different layers, and a crack appears where those layers come together. If one will take two pieces of clay, one very stiff and the other very pliable, and attempt to mix them into one mass, he will soon understand how much is required of the pug mill when he throws into it such clays and expects them to come out with the proper consistency to make perfect bricks.

The black clay has to be wet and thoroughly soaked separately from the leaner clays, or else in attempting to temper them together we get the entire mass too soft, and fail to get the desired result. We keep it well soaked in the bank, continually wetting it before it is dug up, and then we have very little trouble to get it thoroughly incorporated into the general mass. Our second trouble is limestone pebbles. They vary in size from that of a pea to an inch in diameter, and are found only in the third stratum of our clay. They are fatal to all attempts on our part to produce a good brick from the clay that contains them. No matter how hard a brick may be burned it will burst when the moisture reaches that burned lime. Our only remedy is to avoid the clay containing this troublesome ingredient, and as it is not of great extent, that can be easily done. It might be possible to grind the pebbles so fine that they would exist in such minute forms that they would not prove harmful. But we have never tried that, believing that it would be cheaper to throw away such clays, and avoid the risk of failure to grind fine enough. We have seen so many of our neighboring manufacturers make such failures from this cause that we decided not to make the attempt to use such dangerous materials.

(To be Continued.)

SUCCESS SLOW BUT SURE.

Cumulative results are what make advertising profitable. One should never look for specific results from any one advertisement. It is the "endless chain" which begins with the first purchase that is made and is extended indefinitely by one purchaser telling another and they someone else that finally results in a profit. Success in advertising is slow, but with a legitimate article at a fair price it is an absolute certainty in the end. The thing is not to expect too much at first, and not to commence at all unless there is enough money on hand to fight it out to a finish.—Advertisers' Guide.

When advertising succeeds right from the start the secret is usually novelty. Figure out the problem of any such immediate success and you will find something new—a new article, a new scale of prices, a new mode of selling, a new style or scheme of advertising, something or other that sets people thinking because they haven't seen it before. The innovation is usually the article itself, for it is difficult to get the sluggish masses to show much interest on short notice in something they have known for years. Then it is pegging away which tells.—George Batten's Wedge.

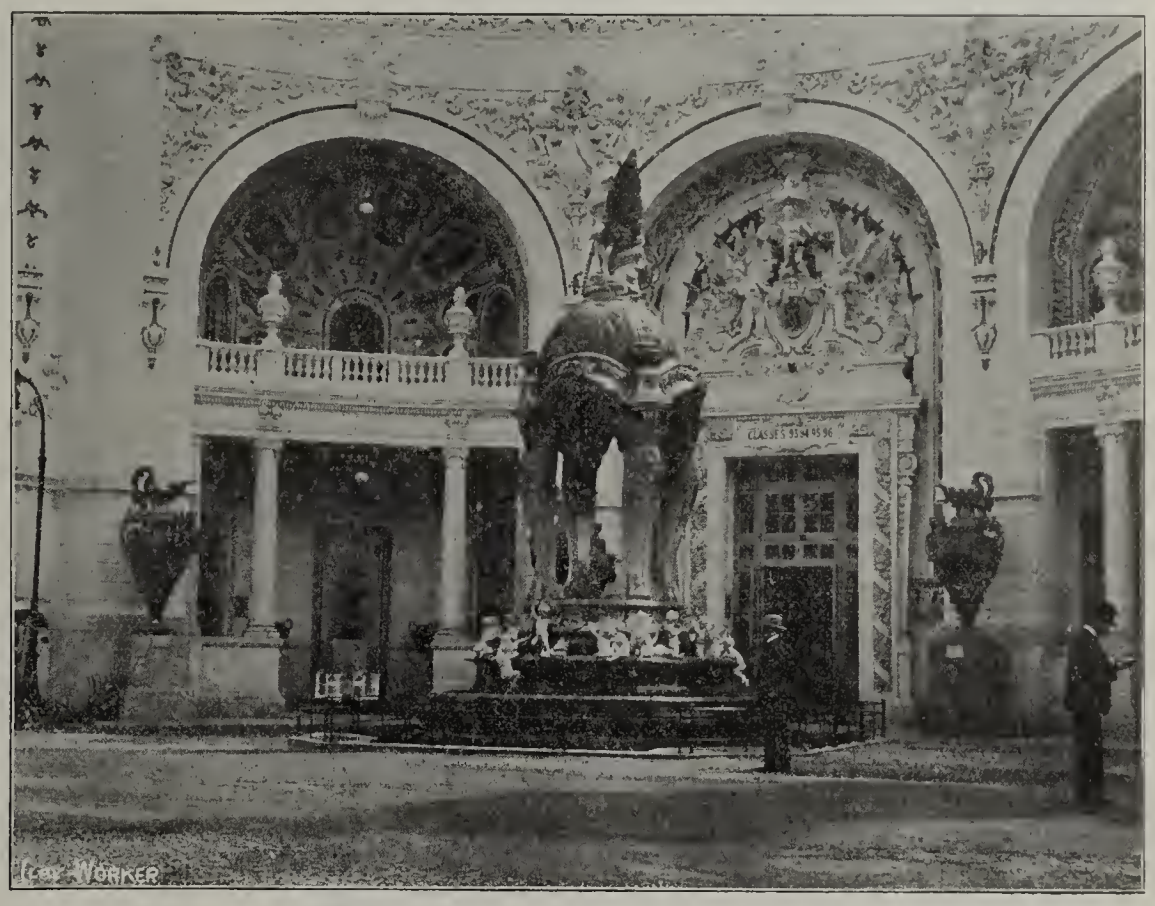
Boom is the first syllable of boomerang. Too much of the former in business often makes it the latter.—Exchange.

WRITTEN FOR THE CLAY-WORKER.

NOTABLE CLAY PRODUCTS AND EXHIBITS AT THE PARIS EXPOSITION.

THERE HAS just been closed one of the most successful expositions which has ever been held in Europe, although up to the time of its termination many predictions to the contrary had been made.

It is but natural, perhaps, that we should make a comparison between this exposition and the World's Fair of 1893, and I think we are justified in concluding that in general architectural effect the Chicago fair was ahead. This, however, is partly due to the conditions that existed at Paris rather than to the nature of the various structures, for Paris had not the vast area in which to make a display that was available at Chicago.



Majolica Fountain Mode at Sevres, Frauce.

There was much for the clayworker to see, admire and absorb, but comparative observations on the different countries were often difficult, owing to the incompleteness of the display. Great branches were wholly lacking representation at times, possibly because space was at times limited, but probably also because there was no commercial gain to be derived from a display. The most marked instance of this, perhaps, was the almost total absence of plain white earthenware or porcelain in the French, German, English or American exhibits. Germany displayed but little stoneware not of an ornamental nature, and so on.

Those who had seen the Paris Exposition of 1879, or had read Seger's description of it, must have been at once struck with one difference, vizz., the absence of burned clay, such as faience, for the exterior decoration of the exposition buildings. It was seldom seen, for its place had been taken by stucco. which was sometimes covered with enameled paint, giving a poor imitation of glazed terra cotta. The exposition authorities made liberal use of burned clay in at least one direction, that of roofing. Thousands of squares of interlocking red tile were used for this purpose, most of them of French manufacture, although the Ludowici exhibit covered one building, while the German building was roofed by Zinstag of Korch. Tile is

indeed a favorite roofing material in Europe, and France, the mother of this industry, still holds the lead here, Marseilles factories even doing an active export trade.

Close to the Eiffel tower was one of the prettiest outdoor clay exhibits at the exposition. I refer to the pavilion of the

Greek Pavilion, of Hollow Blocks and Roofing Tile.

French Touring Club, which was made of pressed brick and liberally decorated by glazed terra cotta. On either side of the entrance were fountains covered with buff glaze, the center being flanked by two large brown majolica swans. Of finer workmanship even than this were two large pieces of the same work from the Sevres National factory. The one, a large wall piece decorated in various colors, and bearing various decorative shapes and figures. On the upper portion was the name of Sevres, with the date of establishment of the factory—1753—on one side, and the present year—1900—on the other. It brought out well the adornment possibilities of this style of work, but a finer bit still was a canopied fountain, surrounded at its base by little cupids, and surmounted by a great eagle and figure of prosperity. The remainder of the clay products used for exterior finish were mostly glazed tiles, as on the Persian, Algerian, Agricultural and Greek buildings.

The individual displays in the different buildings presented a bewildering display; Germany, with its porcelain; Italy, with its majolica; French faience and Danish terra cotta, all claimed their share of attention, and made the most of their opportunities.

It was naturally disappointing to any American to see such a poor representation from the United States, although the familiar sight of the beautiful Rookwood and artistic Gurely served to make one feel somewhat at home, and from our few American exhibits, creditable as they were, no one would suspect that the United States produced nearly seventy million dollars' worth of clay products annually.

The most important exhibitors were France, Germany, England, Italy, Austria, Denmark, Sweden and Holland, although others did their share.

There were but few exhibits of raw materials, and the most complete as well as instructive of them was that by Prof. Chas. Binns. It represented a series of American clays in their raw and burned condition, and attached to each was a label giving its locality, rational analysis and temperature at which it was burned. The whole grouping showed the touch of one having a thorough knowledge of the subject.

The exhibits of structural materials, including brick, terra cotta, roofing tile, encaustic tile, fireproofing and wall tile were mostly from European countries, and presented some interesting features, on which we can touch but briefly.

The French display of encaustic and plain floor tile was probably one of the finest ever seen at an international exposition, and was a good index of the popularity of these products. Their colors and shapes were as numerous and varied as could be desired, and the production of large designs covering the surface of many encaustic tiles was worthy of imitation. German floor tile work can equal the French, but this was not brought out by the Paris displays from the former country. Still Germany made up somewhat for this defect by doing herself credit in wall designs, and the great space over the mantel in the exhibit of the Royal Berlin Poreclain Works, representing hand painting on the burned tiles, was not approached by any other exhibitor. In this connection it would not be fair to omit mention of some of the new Wedgewood tiles from Willeroy & Bock's factory. These greenish blue slabs were 2½ by ½ metres in size, and presented a new feature in that the relief figures were molded with the body of the tile.

The cloissonne style of decoration was another noticeable feature of the wall tile exhibits of France and England especially, and reached its greatest development in the collection set forth by the Pilkington Art Tile Company, of Clifton Junction, near Manchester. In these the design is pressed into the surface of the tile, leaving thin ridges between the different parts of the pattern. The different colors are applied in the hollows, but the ridges keep them from running together. In addition a strip of color was sometimes run along the ridges. The whole is then glazed over. We thus get contrast and bold outlines.

Written for The Clay-Worker:

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 14.

BY ALFRED CROSSLEY.

BEFORE FINALLY CLOSING this series of articles, a few general hints on the construction and laying out of fire brick works, from one who has seen the practical as well as the theoretical aspect of the subject may not be taken amiss.

First of all, build the works on high ground—that is, on ground high enough to give good drainage from sheds, kilns and stacks, so that the surface water will be quickly carried off, no matter how great a storm may arise. Those who have had occasion to burn kilns where the water drained into their foundations, or into the foundation of the chimney stack, will indorse this remark, and in addition to making

Algerian Building with Moorish Tiles.

abundant provision for carrying off the surface water, provide also efficient drainage for the substratum of kiln foundations, so that the kilns may always stand dry, as otherwise they will draw the dampness from a considerable depth, and from quite a distance around. Build sheds with plenty of light and ventilation, and do not be afraid to give plenty of head room—there

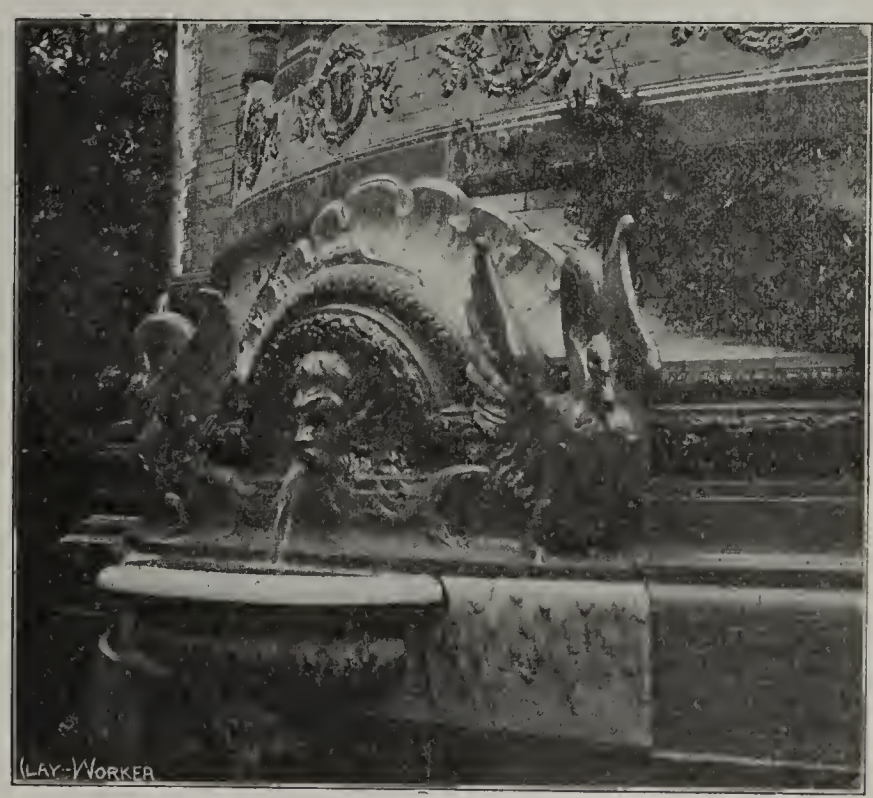
is no charge for space going upward. Put a good ventilator, adjustable, all along the ridge of the shed roof; this will help to create a continuous current of air through the sheds and thus carry off the moisture-laden atmosphere and promote quicker drying, besides adding to the comfort and health of the workmen.

Design the works with a view to convenience and the economical expenditure of force. Let every movement of so many tons of clay per day be a positive movement, or, at least, have as few negatives as possible. Do not arrange things so that you have to go fifty or sixty yards around to reach nineteen or twenty from the first spot. Make the work as easy as possible on the men, without sacrificing efficiency, for work is hard enough at best. The advantage will not all be on the men's side, either, for, as a rule, the less exhaustion required to do any given work the better it will be done. So do not worry if you have a well arranged works and you find on going to some other yard that their men have to work a great deal harder to accomplish similar results, and yet there are employers of just that character, who will hire men at the lowest possible rate of wages, and if a few of them have intelligence enough to do the same work in less time or with less labor than the rest, will put so much more on them as a reward for their diligence and ingenuity.

Esplanade des Invalides containing most of the Pottery Exhibits.

In building a fire brick works look a little ahead of the time present and act accordingly. Some time in the future (perhaps sooner than one might think) you may need to extend the works. Therefore, have this in mind when first building and arrange them so that any addition may appear as a part of the original plan, and the methods of working be simply an extension, and not necessitate probably some new and to all appearances makeshift arrangement. All this may be done if foreseen from the first, but it might not be so easy otherwise. How often have we gone into some works and found the same kind of work going on in one part of it under an entirely different arrangement from the rest, and at a greater cost. You ask the proprietor about it and he says: "Oh, well, when I first started I expected only to make so many a day, and just built in such and such a way, and after so many years I had to enlarge the place and this was the only way I could fix it, and it's the best I could do." Such, in substance, is what we may hear almost any day and I say in the majority of cases a little timely forethought would obviate this.

Local circumstances, and the personality of the manager or proprietor, will, of course, always give, in a greater or less degree, to every works a character peculiarly its own. But at the same time the one general idea should be borne in mind, to make the works just as convenient as possible. All the machinery should be in an annex to the main building. The engine and boiler should be separately housed from the grinding machinery. They may be in the same building, if desired, but tightly partitioned off, so as to exclude all clay and dust. The engine shafting should be so arranged that other machinery can be attached without having to tear everything down and rearrange it. If the works are located at the mines, the pans, etc., should be on the side nearest the clay, but far enough away to give ample space for weathering and storing the clay, as described in connection with that subject. If the clay mine is at a higher natural elevation than the site of the works, it will greatly facilitate the easy and economical working of the plant. The clay should come in on a level with the grinding mill, or on a platform above. This is a convenient method where different mixtures are used, as the attendant can have the different clays in separate heaps and yet convenient for putting down a chute into the mill in proper proportions. One man can handle a large quantity of clay in this way, but if he has to load it into barrows and wheel it it will take at least two men to do the work of one. Never have the clay put down below the level of the grinding pan, causing it to be wheeled up a run. This is a daily waste of force. If the works are situated away from the mines, and the clay is brought in by rail, let the track be arranged so that the clay can be unloaded near to the pans, and the bottom of the cars somewhat above the level of the pans, if possible. This saves labor, and labor is money. Let the coal for the engine be unloaded into a bin near the boiler. The less running around the engineer has to do the better he can attend to his duties and the closer he can watch the responsibilities that are in his hands. Let the molders' tables be off the hot floor, not only for the molders' sake, but also for the boys who offbear, so that they do not have to be incessantly on hot ground. (This is, of course, assuming the work to be carried on by the old hand method.) So, also, with the pressers and their boys, if possible arrange so that they can have some respite from the hot floor. This is not so easy to do with hand pressing, but with a steam press it can be placed on cold ground.



Majolica Fountain, French Touring Club Pavilion.

These may seem to be minor matters, but in summer time, when the thermometer is anywhere from 90 to 100 degrees in the shade and you expect the work to go on day after day, few people have any idea how exhausting it is to do a hard day's work inside a fire brick works, with hot, stifling air around and hot floor beneath, and I have seen many a man and boy come near fairly giving out before the day is done. In this

connection I here repeat the suggestion already made, to mold the brick onto a warm floor only, that will gradually stiffen the brick ready for pressing, and not onto a hot floor. As far as possible let all regular gangways or wheelways through sheds be on cold ground, and also left sufficiently wide so that there may be no excuse for spoiling brick in going through with the barrows, etc.

Another thing, do not try to see how small you can have the sheds, so as to get out a given quantity every day. It is poor economy. Give sufficient room for the day's work, so that brick may not be put down in places where it is ten chances to one of their getting spoiled in some way or other. Have room to put them down in good shape, and, above all, plenty of room to dry them perfectly before setting. Do not try to get twenty thousand a day off a ten or fifteen thousand floor. It might be done perhaps, but in doing it lots of brick will be spoiled. The brick must be set wet and time and fuel are consumed in drying the kiln, for be it remembered they have to be dried somewhere before they can be burned. More brick will be spoiled in the kiln, and the quality of the balance is not improved. Let it be accepted as an axiom, the claims of patent kiln men notwithstanding, that the wrong place to dry brick is in the kiln, and the right place is in the drying sheds.

The kilns should be built at one or both ends of the drying sheds, preferably, I think, at one end. The drying sheds may be built two stories high with advantage, so as to utilize the heat escaping from the lower floor. The upper floor can be used for shape work and special lots. I should not forget to say, however, that for many shapes, and especially large heavy blocks, a room on the ground floor should be provided, with a smooth, solid floor, so arranged that it can be quite cold or heated more or less, as required to suit the goods.

When taken from the kilns, fire brick should not be stacked out to the open weather, but if not loaded up right away, should be stacked in a covered shed built for the purpose.

Whenever it can be arranged the railway siding used for loading should be constructed about four or five feet below the level of the kilns and stock shed, so that in loading the men can wheel into the cars on a level, or slightly down grade. The difference between this and having to wheel every brick up a grade from the level of the track to the floor of the car is more than appears on the surface. Men can do more work, with less wear and tear on themselves and on the barrows and trucks. It seems a very simple thing to see a man wheel a barrow load of brick up a run into a car. But take the output of a works making 20,000 per day, take five days per week and fifty weeks in the year, so as to allow for stoppages, and we have five million for the year's work. That means that every year there must be lifted 17,500 tons from four to five feet from the ground. That does not look quite so simple. But it has to be done in order to get the brick into the cars, and is done, and the employer has to pay for it. This is another instance, except in those cases where it is impossible to avoid it, of a waste of force or energy that is of no benefit to anybody. In laying out new works this should be provided for by arranging the ground level of the works on a level with or slightly above the floors of the cars, unless circumstances render this absolutely impossible.

I have now given a few practical suggestions, to which others might have been added, but I must now bring these articles to a close, which I will do with many and sincere apologies to my readers for all faults and errors in style and matter.

Main Street, Champaign, Ill., Laid in 1883 of Hard Building Brick.

FIRED KILN WITH SILVER TORCH.

The formal opening of the new Wyonissing plant of the Montello Brick Company, at Reading, Pa., took place November 21, in the presence of a large number of stockholders. The continuous kiln was fired by Mrs. Gery, wife of General Superintendent A. A. Gery. A silver torch was used by Mrs. Gery. The kiln is probably one of the largest in the country, being 524 feet long and 80 feet wide, and is inclosed in a building 659 feet long and 200 feet wide. Five million bricks were used in building it. The plant was constructed according to the new patents of A. A. Gery, the general superintendent. Six hundred horse-power is required to operate the new plant. The place is connected so that the gases from the kiln are used as fuel under the boilers, and the waste heat is sent from the kiln to the dryers.

WRITTEN FOR THE CLAY-WORKER.

BRICK PAVING IN CHAMPAIGN, ILL.

By W. H. Tarrant, City Engineer.

ONE OF THE FIRST cities in Illinois to use brick for paving purposes was Champaign. As early as 1883 a brick pavement was constructed on Main street, from Neil street to Chestnut street, and later in that year Neil street was paved, from Hill street to Main street. A portion of the Main street pavement is at present in use, and is in very poor condition, and should be repaved at once.

The above pavements were of the two-course variety, viz., a four-inch gravel foundation, a course of brick (flat) thereon, an inch and a half sand cushion, and a course of brick on edge. The brick used were a hard building brick manufactured in Bloomington, Ill., and were hand made. At the time these pavements were constructed it was a difficult undertaking for a brickmaker to furnish half a million of good hard burned paving brick, and the result was that a large number of the brick were soft. Photo No. 1 shows a view of Main street before a portion of the street was repaved this year.

This city has four classes of pavements as regards the foundation (all the pavements in the city are brick):

First. Two-course pavement, with a four-inch gravel foundation.

Second. Gravel concrete foundation, cement used in the concrete natural hydraulic cement.

Third. Gravel concrete foundation, cement used in the concrete Portland.

Fourth. Broken stone concrete foundation, cement used natural.

The total amount of pavement, including all classes, 7.15 miles, and is divided as follows: Class No. 1, 3.46 miles; class No. 2, 1.38 miles; class No. 3, 0:12 miles, and class No. 4, 2:19 miles.

The first class of pavements (two-course work) did not give the best of satisfaction, for the following reasons: The foundations under these pavements were not very rigid, as some of the streets have been filled from four to six feet. The materials were poor, and the inspection was not very rigid, owing to a lack of knowledge of brick pavements. Repairs were an unknown quantity. Service connections were frequently made with gas, water and other mains, and the pavement improperly relaid. The soil in this portion of the State does not make a first-class foundation; it is better adapted for the growing of corn than the support of a two-course pavement.

The second-class of pavement gives a very much better foundation; repairs can be made, and service connections run and the pavement relaid without difficulty. All pavements laid before 1898 were of the two-course variety, and in that year the concrete foundation was adopted, and has been successfully used ever since.

The third class of pavement was constructed in 1899. This class of pavement gives first-class results. Experiments made with this class of foundation by the writer gave results showing an increase of crushing strength from 40 to 60 per cent. over the broken stone concrete foundation (using the natural cement in the concrete); the proportions used in this class of foundation were eight of gravel to one of cement.

A Two Course Brick Pavement Laid in 1888. Subject to Heavy Traffic and Still in Good Condition.

The fourth class of pavements have been constructed in this city for the past three seasons. This class of foundation gives very excellent results, and is one which is used in a large percentage of the pavements constructed in Illinois which have a concrete foundation. The proportions used were one of cement, two and one-half of gravel (the gravel being about 80 per cent. sand and 20 per cent. small pebbles), and three and one-half parts of broken stone, the stone varying in size from one-half inch to two inches, and being a good quality of limestone. The writer recently made some experiments to determine the crushing strength of broken stone concrete, using the same proportions and the same brand of cement, the only variation being made in the aggregate. In one set of cubes a good quality of limestone was used, and in the other cubes standstone. The cubes were allowed to set for ninety days, and then tested for crushing strength. The cubes having the limestone aggre-

gate gave an increase in strength of 30 to 40 per cent. over the sandstone cubes.

All pavements having a concrete foundation have six inches for a base, one and one-half-inch sand cushion and a course of brick on edge.

No. 3.—Paving Brick on Concrete Foundation. Laid in 1895.

All the materials used in the construction of the pavements are tested and definite requirements obtained. The following are requirements for cement:

Cement—Neat, tensile strength (natural), one day, 60 pounds per square inch; seven days, 150 pounds per square inch; Portland, 175 pounds and 500 pounds, respectively. The cement is also tested for soundness and firmness.

Brick are tested for cross breaking, abrasion and absorption. In the abrasion test the rattler is used and the University of Illinois standard shot. The brick which have been used for the past three seasons are the Clinton (Ind.) block and the Poston block.

In all residence streets the combined concrete curb and gutter is used exclusively, the gutter proper being eighteen inches in width and the curb five inches in thickness and seven inches high, and the upper edge curved to a radius of one and one-half inch.

No. 5.—Elm Street, Paved with Poston Block in 1899.

The combined curb and gutter has several advantages over the limestone curbing. First, it is cheaper; second, better alignment and no joints; third, the wearing qualities are as good or better than limestone; fourth, it gives the pavement a more finished effect. In the business district the limestone curb is used.

Photo No. 2 gives a view of the second pavement constructed in this city (constructed in 1888). It is a two-course pavement, as above described, and the brick used were manufactured in Urbana, Ill. The street has had very heavy traffic and is in fairly good condition at present.

Photo No. 3 shows a view of the first pavement constructed in this city, with a broken stone concrete foundation, and was constructed in 1895. It is the leading thoroughfare between this city and Urbana, Ill., and is located on a street owned by the University of Illinois. This pavement has a six-inch broken stone concrete foundation (natural cement used in the concrete), one and one-half-inch sand cushion, a course of Clinton (Ind.) brick on edge, and a sand filler. When this pavement was constructed it was intended for light traffic, but in 1896 the Library building was built, and it was necessary to use this pavement, all the heavy material passing over it. The pavement, however, is in first-class condition, and scarcely shows any wear, and will last many years.

No. 4.—A Fine Stret. Laid in 1898.

Photo No. 4 shows a view of Green street. This pavement was constructed in 1898, and has a six-inch gravel concrete foundation (natural cement), and one and one-half-inch sand cushion, a course of Poston block on edge, sand filler and a concrete curb and gutter. This pavement is giving good satisfaction, and makes a fine street.

Photo No. 5 shows a view of Elm street, which was constructed in 1899. This pavement has a six-inch gravel concrete foundation (Portland cement). This foundation is the best in the city; one and one-half-inch sand cushion, Poston block, a sand filer and a concrete curb and gutter.

Photo No. 6 gives a view of a portion of University avenue, which was paved in 1899. This pavement has a six-inch broken stone concrete foundation, one and one-quarter-inch sand cushion, a course of Clinton (Ind.) brick, and a concrete

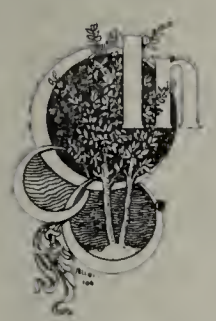
curb and gutter. This street is one of the best in the city, and one which is generally admired by visitors to this city.

Photo No. 7 shows a view of Main street after repaving, which was done this year. This pavement has a six-inch broken stone concrete foundation laid on the four-inch gravel foundation which was under the old pavement, one and one-quarter-inch sand cushion, and a course of Poston block. This makes a very fine business street. The brick inside the street car track and one row outside of each rail were parallel to the rail. Fig. 8 shows the method of paving the street car tracks and the foundation used on all street car tracks recently paved. By this method and using the three and three-eighths-inch block the space between the rails is filled without cutting any brick or using bats, giving the street a very neat and attractive appearance.

No. 6. University Avenue, paved in 1899.

Written for The Clay-Worker.

A CLAYWORKER'S OBSERVATIONS IN HAVANA.



OUR FORMER LETTER, under the above head, published in the October number of The Clay-Worker, we stated that "we have seen no brick pavements in the city," but in our later rambles of inspection we found that a number of blocks had been paved with vitrified brick, shipped from the United States as an experiment and as a guide to future paving.

—Brick Pavements In Havana.—

Nearly all the brick pavements were laid near the docks, where all the heavy traffic of the city is carried on. These brick pavements have been laid a little more than a year, and show no perceptible wear, although the punishment given them by the large two-wheel carts, with their heavy loads, is the most severe.

Two blocks along two sides of the Second Palace are also paved with brick made from fire clay, while the other pavements were of shale brick. These were laid about the same time as the other brick pavements. The traffic at this point in the city is comparatively light, as it is general officers quarters, but the brick are very badly worn. Capt. Moore, of the Department of Civil Engineers, who had charge of the work, stated to the writer that these brick were laid by mistake, as they were not intended for paving brick. There is, therefore, good excuse for the bad condition of these two blocks, and we are of the same opinion still, that vitrified brick make the best pavements.

One hot afternoon, as we sat in the lobby of the Grande Hotel Pasaje, enjoying the flavor and aroma of a large Havana, Cuban-made cigar, we were invited by our friend, a Cuban gentleman, refined and educated and deeply interested in bricks, to go with him the next day on a tour of brickyard inspection. We accepted the invitation, and next morning were up bright and early, so as to be well on our way before the sun was too high.

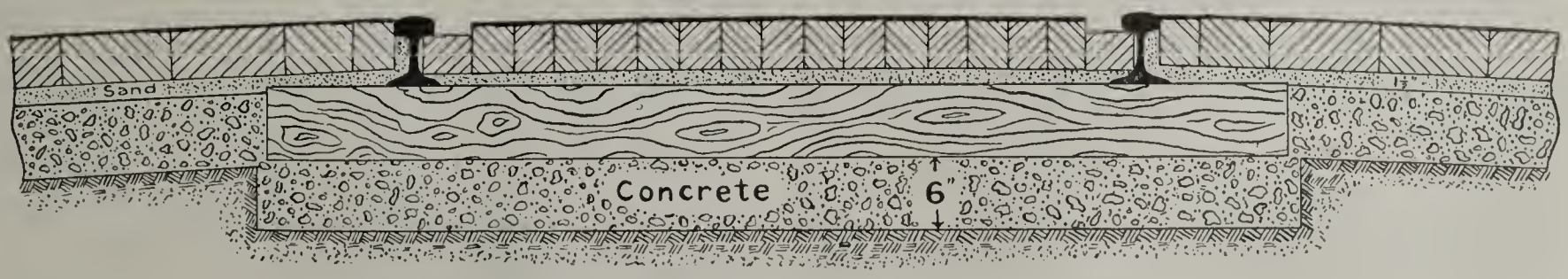
We traveled by rail for some distance and then entered a carriage, drawn by two horses and attended by three Cubans. After driving some miles over good roads and bad, we came to what was once a brickyard. That was before the Spanish-Cuban war. During that war the yard was completely destroyed, and now there is nothing left but a few bats to mark the place of industry where once men labored in peace and honest toil.

After a careful examination of the site we found a few whole brick. These were 3x6x12 inches, hand made, red in color and fairly well burned. The clay from which they were made was soft and plastic, and a very dark yellow or nearly brown in color, and on the whole was not much different from many of the drift clays found in the States.

While we were viewing this old site we occasionally stopped to gather from the cactus, which grew in abundance all about, a tart fruit of very pleasant taste. We also picked from the bushes some guavas, a very fine fruit, resembling in appearance small oranges.

From here we drove across the country a few miles to another brickyard, which fared better during the war, and for some reason escaped the vengeance of the Spanish soldiers. The brick manufactured at this yard were made in the old primitive way by hand. The clay was brought from the bank by mule and cart, and pugged in a crudely-constructed upright tub, in which there was a vertical iron shaft with pug knives at-

No. 7. Main Street Recently Paved.



No. 8. Cross Section of Pavement and Street Car Track.

tached and worked with a sweep by mules or oxen. The bricks were molded to the Cuban regulation size, 3x6x12 inches. The clay was of the same soft, plastic nature as described above, free from any visible amount of silica. It was a brownish yellow in color, and burned a very good brick of a desirable red.

—How Brick Were Made In Cuba.—

The brick were dried under a large shed on a system of shelves. This shed was about 150 feet square and covered with Spanish roofing tile, made on the yard, but were of an inferior quality. The shed under which the brick were burned, in the old temporary clamp, was also covered with tile. There was also another large tile roofed shed, used for storing the stock of finished ware made on the yard.

On this yard they made drain tile or sewer pipe by hand in the same manner that the potter makes jars and jugs. These tile were made very thin, the thickness not being more than one-half inch.

They were slightly narrowed at the end and a shoulder turned, so that one tile would fit into another in laying. A very interesting fact about these tile was that they were slip glazed on the inside. They were made in about two feet lengths, in several sizes, with curves, Y's and T's, same as our sewer pipe are made.

They also made Spanish roofing tile and some flat tiles, about 1x8x8 inches, which were used for floors.

—A Queer Tile Kiln.—

The kiln in which all these tiles were burned was the most novel one we have ever seen. It was round, about ten feet in diameter and eight feet high inside, had a crown and was burned up-draft. Just below the spring of the crown was a number of small holes through the kiln wall, for the escape of the smoke and to afford draft. It had but one furnace, which was directly under the kiln and was nearly, if not altogether, as large as the kiln.

The furnace was entirely below the surface of the ground and had but one door, which was about three by four feet. The floor was supported over the furnace by arches turned from one side of the kiln to the other. These arches were about 12 inches wide and 8 inches apart.

The fuel used was a fine brush or bushes, and very dry, and put into the furnace in bundles like sheaves of wheat.

We confess our surprise at the results the finished product produced in this simple kiln, lacking, as it was, in the principles of draft and concentration of heat.

As a result of the war, this factory has not been in operation for the past five years. Two Cuban families were occupying the sheds as homes.

The demand for brick in Havana is far beyond the supply and the price $18 to $20 per thousand.

During the coming year the demand for brick will be greater than ever, on account of the large contracts which have just recently been let for the construction of a sewerage system for the city and the paving of the streets.

There are some very good clays to be found near Havana, but there is a great lack of local capital for the construction and operation of proper factories for the manufacture of brick.

There is also a lack of brickmakers—of men who understand the brick business.

The unsettled condition of the government at the present time retards to a great extent the investment of capital in this otherwise most inviting field.

The country is beautiful, delightful and healthful and inviting as a place of residence. The country is rich and contains fortunes for those who are willing to invest and those who are willing to work.

There were other places to visit, but the morning was too far spent to go farther, so we returned to the city. We were well pleased with what we had seen and will always remember with pleasure the courtesies extended by our friend, the Cuban gentleman whose invitation we accepted. ITHAMAR.

Written for THE CLAY-WORKER.

BUTTON-HOLE TALKS.

HE WAS VERY, VERY THIN—so thin that it strained him to cast a shadow—and his manner was diffident and retiring. He did not court attention at all, but rather sought to avoid attracting notice, and, indeed, his every feature bore testimony that whatever attention he had attracted had been to his personal disadvantage. His body, tall and slim, was yet shrunken and warped. He was knock-kneed and his feet were bunion laden and misshapen. His chest was hollow, and his arms, long beyond reason, bore hands, the one minus three fingers, sacrificed to the all-devouring feed cutter, the other decked plentifully with big knobby joints, callouses and scars. Part of one ear was gone, his nose was broken and he was cross eyed.

He was not saying a word to me, but was trying to get away, avoid all the attention he could, and sneak away, but I would not let him. It was a case of capture. I ran him down and held him; knew I never would have another chance to find how life appeared, and what the world was, to one like him, a social remnant. To a man who had harvested hard knocks and accidents and whose voyage through life had never brought him within hailing distance of good fortune and abundance. When I caught him he tried to shut up and shrink into himself, like a captured clam, but I hooked his finger into by buttonhole and explained to him that I was the regularly-appointed receiver of everybody's woes and troubles. The charm worked. He seemed to recognize by a sort of intuition or instinct, hooked his finger in tighter, leaned up against me with something almost of confidence, breathed a sigh of contentment—and onions, half and half—and told me his tale.

"I was not always thus," he said. I started, wondering if he thought he could spring a Spartacus rehearsal on me, but, focussing the eye that was coming my way, I found it honest and sincere, and he continued: "I was once a babe and plump and rosy. Then came the stripling age, and I grew up and up, until I warped, but the thickening process never set in. Nothing came my way that I wanted and everything that did come hit hard and had sharp corners. Now, overgrown, warped, maimed and disfigured, as I am, no one is attracted by me. No one wants to talk to me, to take me by the hand or have anything to do with me, for I have none of those things called attractions. A man disfigured in battle becomes a hero, and his wounds appear beautiful, but no one reverences what a feed-cutter leaves, though sometimes it takes more heroism to work a feed-cutter than it does a gun. People learn that a crooked, gnarled, rough and uncouth shell often hides a splendid oyster, but no one looks under my rough settings for anything noble, good or true; nevertheless, my inside feelings are not nearly so rough as my outside signals. It is possible I have some good inside, but I haven't the chance of the oyster. Avenues open wide to men of attractive address are close shut to me, and I must earn my meagre subsistance out of sight and slink to my lonely lair like an abhorred animal. I get nothing for my money, even when hardly earned. Why, in a street car even a child gets more rights than I. People crowd me and glare at me and begrudge me even the little room I occupy. This morning they crowded me on both sides and elbowed me until I was a sliver of humanity and then they grudged me even the little space I did occupy. I got even with them once, though, when a big, fat, colored washerwoman came in I gave her my seat and the way she sat down on and overlapped those dudes did me much good, you may be certain."

"My eyes see straight even if they are crooked. I can look at beauty but at a distance only. Nothing of it is for me. The little God of Love may hit me with his shafts, but he fires no return or companion arrows. There's no Jill for this Jack. No face lights up with joy at the sight of mine. I have no one to love me, to cheer and comfort me, to look for my homecoming with delight or kiss me and regret my departure.

"You wouldn't win any prizes at a beauty show yourself, and I can only guess at what you have inside. Good outward signs frequently cover a bad liver and a crooked disposition, but you don't know anything of my trials and ought to thank God that he hasn't given you my handicap." GATES.

WRITTEN FOR THE CLAY-WORKER.

A BALTIMORE BRICK.

ALL IS WELL AT BALTIMORE. This old city has taken a new lease of life and bids fair to become as famous for her magnificent public buildings and great commercial structures that tower skyward as she was a generation ago for her rows of two-story brick buildings, with their spotless marble steps and somber green blinds, which made all Baltimore look alike to the stranger who tarried for a time within her gates. No city in the land can show more substantial evidences of prosperity than is seen on every hand throughout her business thoroughfares. The visitor who knew Baltimore of ten years ago can scarcely believe his eyes as he views the many improvements in the building line. She can to-day boast of some of the finest buildings, both public and private, to be seen anywhere and her brickmakers have contributed their full share of the materials from which these great piles have been erected.

Perhaps no city in the Union was better supplied with brickyards, and for a number of years it seemed that no matter how great the demand, the supply was always a little greater. The result of this keen competition was most felt and appreciated by the brickmakers themselves. So a year or two ago a few representative manufacturers, under leadership of Jos. Wilson, formed an organization, purchased all the yards then in operation, and since then have controlled the market. Prices were advanced some, but not to an unreasonable extent. The result has been very satisfactory, both to the manufacturers and to the users of brick. The latter, while they pay a little more for their brick, are assured of a stable market, a matter of no little importance to contractors and builders.

Most all of those whose yards were purchased are interested in the new organization, which is known as the Baltimore Brick Co., and have good reason to be satisfied with the new order of things, for it results in more economical methods of conducting the business, which means a larger per cent. of profit, even though prices be advanced but little. The success of the Baltimore Brick Co. is due largely to the wise management of Mr. Wilson, in whose hands the reins of authority were placed. That he is a good, safe driver is shown by the accompanying picture, taken from life, and for which we are indebted to the Architect and Builders' Journal, of Baltimore.

Mr. Wilson believes firmly that the old adage, "He who by the plow would thrive must either hold or drive," applies particularly to the brick business, and while he calls to his aid and counsel his associates who have been identified with the brick business of Baltimore for lo, these many years, his is the master hand that guides the enterprise. He has promised to attend the next N. B. M. A. Convention at Old Point Comfort, February 11-16, and tell those who want to know how he does it. He expects to be accompanied by C. H. Classen, C. H. Cromwell, Charles F. Diggs, W. H. Perot, Jacob Klein, J. R. Pitcher, Warren Griffiss, H. W. Wanamaker, and other well-known Baltimore brick men, who will make their presence felt on that interesting occasion.

Jos. Wilson, President Baltimore Brick Co., as he appears in an Original Characterization of "I'd Rather Be the Brick Man"

NOT THERE.

The Ship's Doctor—Never go in bathing after a full meal.
Patient—Why not?
The Ship's Doctor—Because you won't find it there.

WRITTEN FOR THE CLAY-WORKER.

SECRET INFORMATION.

IT IS A PECULIAR FACT, yet, nevertheless, true, that there is scarcely a clay manufacturing plant in the country with which there is not connected more or less knowledge which is regarded as "secret information." This undoubtedly applies with more emphasis to the manufacturer of the finer grades of wares, although the majority of brick manufacturers can by no means be exonerated from the charge of guarding certain valued secrets. I say valued secrets, for many are valued beyond price. They are considered most sacred. To ask for this "secret information" would be almost like asking a man for his pocketbook or the combination of his safe, and, indeed, the former would be handed over with more reluctance. The practice of guarding this information is not of recent origin. It is not due to the keen competition nor the vast improvements in almost every branch of business; nor is it due to the improved business methods adopted by the present generation. Competition undoubtedly was never more keen in the history of the world than it is at present, and every wise business man is forced to lay his plans to get the most out of his holdings and his ingenuity is taxed in an effort to resort to greater economical business methods in the management of his affairs generally. Yet this condition of affairs, or whether his stock is above or below par, or whether paying big dividends, or whether his plant is in the hands of a receiver, does not lessen the value of these secrets. They never decrease, but more often grow to still greater proportions, and, indeed, are regarded too valuable for appraisement, and the longer he nurses them the more valuable they become in his estimation. Yet put them on the market and what will they bring? To some of this information much value can be attached. Most of it, however, would have to be retained for want of buyers. But the value of these receipts does not lie so much in themselves alone as in the ability of their possessor to utilize them.

It might not be considered out of place to allude to the bulk of receipts which are offered at a stipulated price. It is not necessary to discuss them to any extent. Each can draw his own conclusions as to their value. No more striking example of these valued receipts are to be found than those pertaining to the pottery industry. How many interested in the manufacture of clay goods have paid from five to twelve dollars for a small volume of technical receipts which possessed little or no commercial value to the purchaser? Taking for granted that the receipts were bona fide and those successfully used by certain manufacturers in certain localities under certain conditions they would prove of but little value to a manufacturer of the same class of ware differently situated, using ingredients derived from other sources, perhaps burning at a different temperature, using different kilns, different body, different kind of fuel, etc.—a difference of any one of these conditions which in itself would be sufficient to cause a discrepancy. The difficulty with most receipts published lies in the fact that they simply contain the bare receipts without trimmings. They fail to go into details sufficiently to enable one to obtain satisfactory results without performing a considerable range of experimenting to reach the desired end. They are valuable only insomuch as they are suggestive of ideas or serve as a basis for experimentation. To the novice they would serve this purpose more adequately than to one more experienced. To present this point more fully allow me to cite the following examples of English extraction, which is a fair average, taken from a work which has found considerable patronage in the United States. The following receipt is a typical one, and classified under the heading of "Special Glazes for Brick and Pottery at One Burning—To Run These Glazes Intense Heat Is Required:"

Forty parts Cornwall stone.
Seven parts flint.
Four parts Paris white.
Fifteen parts ball clay.
Six parts oxide of zinc.
Fifteen parts white lead.

Here is another:

"The following glaze is excellent for brick in the biscuit and pottery which requires an easy firing:"

Twenty parts white lead.
Nine parts stone.
Nine parts flint.
Four parts borax.
Two parts oxide of zinc.
Three parts feldspar.

The receipts fail to tell anything about the composition of the body on which the glazes were used, or to give any definite idea of the temperature of the glost fire, or any information beyond the proportions and kind of ingredients used in the glaze. What a vague idea "intense heat" conveys! Does it mean approximately Seger cone one or cone fifteen, or does it not matter? "An easy firing" is about as meaningless, for some clays would become viscous at a temperature which one manufacturer might term "an easy firing." These rules, if followed, would likely produce very erroneous results. The fallacy of marketing a bundle of receipts of this character is apparent. They find a sale among those engaged in various branches of ceramic manufacture, some of whom are seeking information, while others are led to invest in a copy out of mere curiosity or thinking that the contribution will make a valuable addition to their library. Is there any reason why so much value should be attached to those receipts? To one not directly interested in this particular line of manufacture they would prove of little, if any, value; to him who is engaged in this particular line of manufacture they would fail to convey an infinite amount of knowledge, for they encompass nothing, perhaps, which he does not already possess and of which he has a clearer conception than conveyed by these receipts. Give any one access to the best equipped library, containing the latest and best literature on any branch of science—take, for instance, the study of chemistry—give him all the book knowledge of chemistry which his mind can grasp, give him various chemical receipts, and let him study various chemical reactions, and with this book knowledge alone would he possess a knowledge of chemistry of commercial value? Shut him out of the laboratory, and allow him no opportunity to put into practice this knowledge and to study the reactions for himself, and to learn to reason from cause to effect, to watch his failures and successes, to draw his own conclusions, and he will fail to become master of the subject. His book knowledge thus gained would be of no greater value to him than many of the receipts referred to are to the average purchaser.

There is, however, another point to be considered in regard to some few receipts. We learn of certain processes which have long been regarded as secret, and many are justly worthy of meriting such distinction. We are told how the Chinese for many years kept the process of manufacturing pins a secret. We realize that this process was part of their stock in trade. We cannot blame them for having attempted to limit the manufacture within their own walls as long as practicable. Indeed, the possessor of such secrets as this even to-day would guard and protect it in like manner, and would be justified in so doing. But, on the other hand, there are many so-called secrets which in reality are not secrets, but common property with those engaged in similar lines of manufacture. Present conditions seem to indicate that the growing tendency of the American people is broadening from this point of view, and that they are becoming less narrow-minded in endeavoring to conceal what to some extent is universal knowledge. Not many years ago manufacturers of most grades of ceramic ware were loath to discuss their body composition and certain details of manufacture with their neighbors—their competitors. Each took the same stand in the matter for fear that others would profit by their experience. But when Seger and others began to gather in and analyze samples of the raw bodies used by different manufacturers it developed that much of the "secret information" was common property. After making a rational analysis of these different bodies the proportions of clay substance, feldspathic matter and silica were found to lie within certain prescribed limits and all within

close proximity. To-day the potter is a step nearer his neighbor in this particular. Most of them in the same locality purchase their body ingredients from the same dealers, get their clays from the same bank, use very similar mixes, buy their coloring pigments from the same source and burn their biscuit and glost to practically the same temperatures. Each being aware of this has resulted in more pleasant relationship, both socially and commercially. And yet we dare say that it would be a difficult matter to single out any one of these gentlemen who is not nursing certain "secrets" which are far more dear to him than all else that he possesses.

Undoubtedly some few secrets have been lost and some no doubt have died with their owners. We learn of certain pottery achievements of the early Chinese and Japanese which are purported to have been lost during the Dark Ages and to have remained a mystery for several hundred years, but so far as known the achievements of early days are being duplicated in this generation. And, too, without doubt, prehistoric races are accredited with certain accomplishments to which they are not justly entitled. Nevertheless, whether this is true or not, or whatever may have been the traits and inclinations of earlier races or whether they harbored the selfish desire that their trade secrets should either be handed from father to son or die with them rather than let the world profit by such information exerts but little or no influence upon the individual of the present generation. Reflecting on the lives of the human races in general, of public spirited men, of men in private life, of our nearest friends, of those with whom we are most intimately acquainted, viewing things from a purely unprejudiced standpoint and in the light in which they actually exist, we find that the general tendency, we might say natural tendency, almost without exception, indicates that there is embodied in the lives and actions of men motives more or less selfish. Is it not this motive which prompts each to hold fast to his pet secrets? What would prompt the individual to cleave so dearly to his "secret information" unless it be to satisfy a purely selfish motive? We leave the question unanswered. Nevertheless, times and conditions seem to indicate that the tendency of the age is more toward openhandedness, and the higher plane of development we reach intellectually as a nation just so much less will become the amount of "secret information." E. E. GORTON.

OBITUARY.

THE DEATH of Richard C. Washburn, at his home, at Saugerties, N. Y., December 3, after nearly a year's illness, removes a well-known and prominent brick manufacturer of this section. Mr. Washburn began his apprenticeship on the brick yards in Haverstraw as a boy and continued at the trade until he was thoroughly conversant with all its details.

In the early fifties he, with his brother, Uriah, formed a partnership with a Mr. Cooper and built a yard at Grassy Point. They were very successful. Mr. Cooper withdrew from the firm and the two brothers assumed his interest a short time afterward. Later on Mr. Washburn formed a partnership with a Mr. Campbell and started a yard in Jersey City for the manufacture and sale of building material. He then severed his connection with his brother.

Mr. Washburn was a self-made man in every respect. He gained his education in the common schools of more than fifty years ago. His word was his bond, and his honesty was beyond question. He was at one time president of one of the Jersey City banks, and back in '74 and '75 served in the New Jersey Legislature. He was elected a member of the Jersey City Board of Works by a large majority, a surprising fact, when it is known that Mr. Washburn was a strong Repbulican and the city was strongly Democratic.

At the age of 65 he lays aside the cares of this life and leaves behind him a record of which his family and the brickmaking fraternity may well be proud.

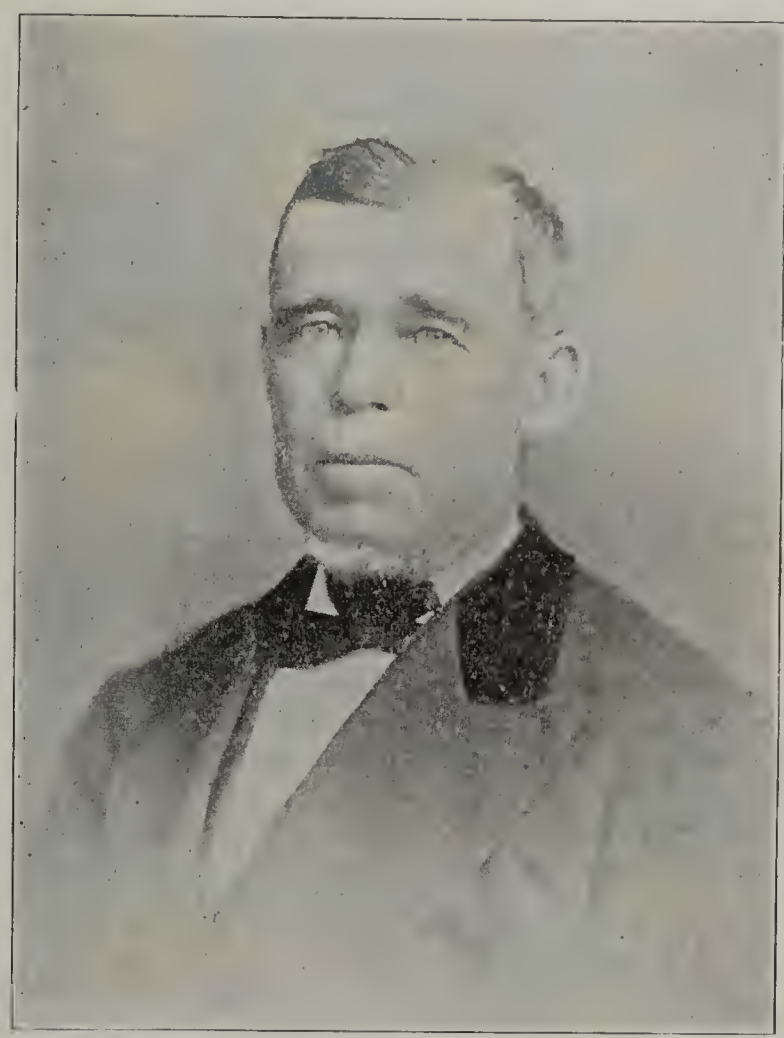
Death of Chas. Sheppard, Montreal, Can.

Montreal lost one of its best-known and most-honored citizens in the death of Charles Sheppard, which occurred at his home, October 12. For many years he had been identified with the brick and building interests of that community. He leaves a widow and two sons, the latter succeeding to the brick business on the retirement of their father, owing to poor health, two years ago. Speaking of his demise, the Canadian Architect and Builder says:

"His death removed from amongst us one more of the stanch men of the old school—a man of honor and probity. One of the most touching tributes to his memory was a handsome pillow of flowers which his numerous employes placed upon his grave, bearing the inscription 'Le Maitre.' Mr. Sheppard was always ready, in an unassuming way, to assist the needy, and an appeal to him always met with a substantial response."

Henry C. Carroll, Philadelphia.

AS THE YEAR draws to a close we are called on to chronicle the death of Henry C. Carroll, founder of the well-known brick manufacturing firm of H. C. Carroll & Sons, now known as E. H. Carroll & Sons. His death was due to debility incident to old age, and occurred on the 25th of November. He was buried from his late residence, 3831 Lancaster avenue, on the morning of the 28th, solemn requiem mass being celebrated in St. Agatha's Roman Catholic Church, at



The Late H. C. CARROLL, Philadelphia

Thirty-eighth and Spring Garden streets. The interment was in the new Cathedral Cemetery.

Henry C. Carroll, who was in his seventy-ninth year, was born in Ireland, and came to this country with his parents at the age of 15 years. After working in the old Pittman yards, at Twenty-first and Chestnut streets, he started making brick for himself in 1854. This business he continued to superintend until forced by the weight of years to retire, leaving the business in the hands of those stalwart, honest and active sons, Eugene, Michael and Peter, who make every endeavor to emulate the splendid precepts laid down by the father—conscientious dealings, good bricks for good money and kindly treatment to those you employ.

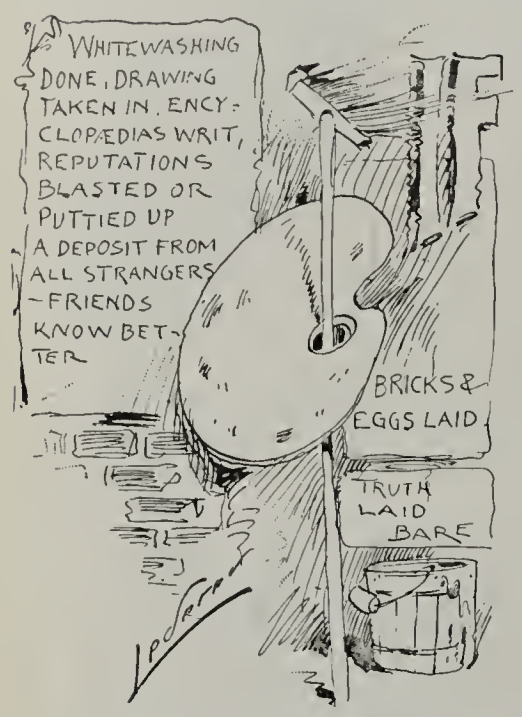
Through this channel we extend the hand clasp of sympathy.
W. P. L.

Ride your hobby if you will, but don't play horse with your friends.

Written for THE CLAY-WORKER.

PREHISTORIC CLAYWORKERS.

Brick Without Straw and History Without Facts—Our Conscientious and Accurate Artist-Contributor Makes History With Nothing Up His Sleeve and Without Confederates.



THERE IS anything better than building up a reputation with a brick foundation, I would like the receipt. When I escaped to New York, comparatively a stranger, I was immediately recognized as a great authority on clayworking, a noted brick sharp, in fact. I never fully realized this until the other day, when I was approached by the publishers of the Universal Encyclopedia Complicatus, who desired me to write the "History of a Brick" for their new edition. The U. E. C. is one of those works in 9 large volumes and appendicitus, of which the publishers never have more than a limited number left and which they almost give away (just to advertise their liberality) on payment of one dollar down and one dollar per month for forty years after.

The mere fact of their coming to me showed that they were looking for something novel, original and out of the beaten tracks of fact. Of course, I could go to any old encyclopedia and get some shop-worn history of brick and brickmaking, but I knew that was not what the publishers wanted. Their very advertisement showed this. Didn't they announce that the contents of their works were different in every particular from anything heretofore published? I have given them something different.

So very different.

It will suffice to give a short extract to show that there is no mildew on the wad of knowledge that I have contributed to the Universal Encyclopedia Complicatus.

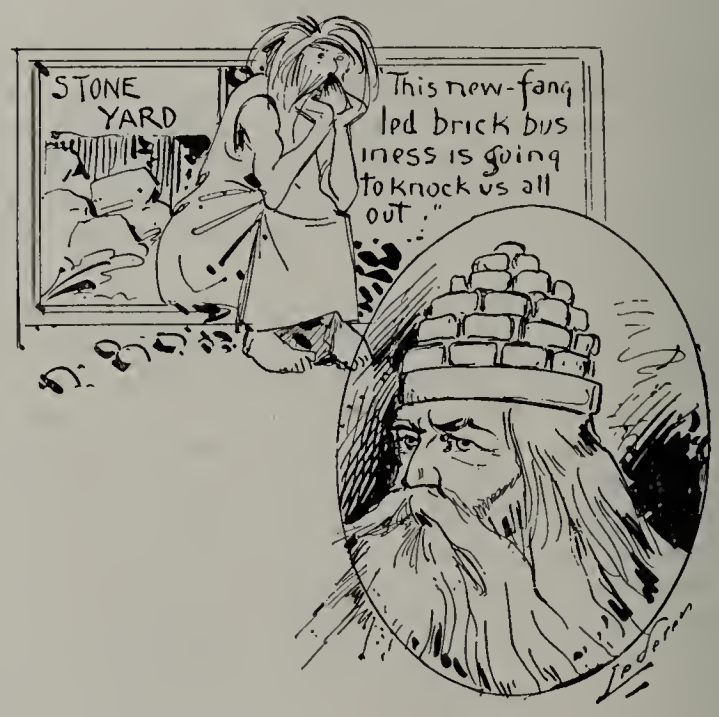
I start thus:

"Brick, which the early English, having no spelling books

worth speaking of, spelled bryke, is a kind of artificial stone of rectangular shape made of finely kneaded clay, except in some cases where a freezer is used and cream of cornstarch is substituted for the clay. The latter is used for building purposes only by the Esquimeaux. When an Eskimo has surfeited himself with two or three courses of candle grease he usually concludes with dessert by biting a hunk out of the side of a house. The old Danes spelled it brikke, and used bricks for weather-wanes, because, as Skaljet, the historian of the seventh century claimed, of the well-known fact that "straws show which way the wind blows," thus proving also conclusively that even in that age bricks were not made without straw.

It is an undoubted fact that brick was the invention of either Resef-Mikal (commonly known as Mike in Phenician Mythology) (Mike was also known as the Phenician Apollo) or of Odhinn or Odin, the son of Bor, the God of the Norsemen. I believe firmly in the claims for Odin over that of the Phenician. Odin and his two brothers, Vili and Vi, slew the frost king, Ymir, and his family, Jotuns, and built great coldproof structures of blood-red brick in place of the frost palaces of the Ice King. Solenter, the chronicler of mythology, bears me out in this. I quote as follows from him: "The enormous body of Ymir was carried by Odin,

his daughter Aesir and his brothers, Vi and Vili, out into the middle of Ginunga-gap where they proceeded to reconstruct the world (on highly improved lines, I must say)—the earth from his body, the sea of his blood, the coloring matter being extracted to be used as the pigment, to stain all human habi-



tations (evidently referring the color of brick), the mountains of his bones, and the trees of his hair, while his beard, which was of a tawny hue, was converted into straw to mix with the marrow of his bones which Odin & Co. turned into clay (showing conclusively that they knew something about brick culture). Of the arch of Ymir's skull they formed the sky, his brain scattered in the air became the gloomy clouds, while the sparks from his cold glittering eyes furnished the stars. Catalogue by mail on receipt of stamp. Mention this journal.

But I will not proceed further, or I will spoil the sale of the encyclopaedia by divulging its most valuable contents in advance. I merely wished to give an inkling of the depth of my research and how easy it is, even if you don't know how, to get up nice, ponderous articles on unknown subjects if you only plunge right in and get way out of your depth at the first

dive. Of course, I give in my history a fair inning to the claims of Resef-Mikal, but my inclinations naturally turn to the pretensions of Ymir's slayers, yet I think I have avoided any appearance of excitement or race prejudice in the matter. I have had Phenicians for next door neighbors and they are

quiet people, who made their children behave and keep off my grass plot, and at the same time as decent a little tailor as ever had confidence in my financial resources bore the name of Snorri Sturlessen and came from Iceland and showed me an heirloom which had been handed down in his family for centuries and centuries. It was the time book of his three hundredth and eighty-fourth great-grandfather, who had worked on the almost prehistoric brick emporium of the late Odin Bros. & Co., of Utgaro, Scandinavia.

They say history repeats itself, but I am willing to give odds that this will remain the only one of its kind.

CHARLES LEDERER.

WRITTEN FOR THE CLAY-WORKER.

CONSUMPTION OF FUEL IN BURNING BRICK.

QUESTION OF FUEL consumption is, and always will be, the "burning" question of brickmaking and the more we know about this so very important process the more will we be able to conduct burning economically. The importance of this fact is especially realized in Europe, where coal is high, and there the question of fuel consumption is the all-important one. Some good work was done by the German Association of Clayworkers last year, when they collected data in regard to the actual consumption of fuel in burning clay wares. The society sent out a trained man for the purpose of determining the coal consumed per thousand brick of known size and weight, and also noting the kind of kiln, the character of the clay and the coal. Note was also taken of the method of manufacture and the degree of dryness in which the brick were set into the kiln.

The results, covering some fifty brick works, were collected and calculated to a standard basis. If the figures in regard to the coal consumed had been simply expressed in terms of coal, that is, if it had been reported that one cubic yard of a certain kind of clay, burned in a certain kiln, required so many pounds of coal in burning this would mean but little since the different kinds of coal differ very much in heating value. For this reason it is necessary to reduce the whole question of heat consumption to an absolute fixed standard, that of heat units.

Let not this apparently so theoretical word, heat units, discourage you from giving this subject your attention, fellow clayworker. It is essentially a very practical expression. The heat unit simply is a measure of heat, as the bushel measures wheat, and like the bushels of the several States, so we have at least two systems of measuring heat; that is, of applying measures like the ounce or the pound. The one, the so-called English system, calls a unit of heat that quantity of heat necessary to raise a pound of water one degree Fahrenheit, the other, called the French system, adopts as the heat unit—calorie—that quantity of heat necessary to raise the temperature of one kilogram of water one degree, Centigrade or Celsius scale. We see that it is simply a matter of applying different measurements. We can readily change one to the other by remembering that one kilogram is 2.2 pounds and that by multiplying the number of centigrade degrees by 9-5 and adding 32 we obtain the number of Fahrenheit degrees corresponding to any temperature. However, in heat measurement proper the Centigrade degree is equal to 9-5 of a Fahrenheit without reference to the 32 degrees. Carrying out this multiplication we find that one French heat unit is equal to 3.96, or about 4 English heat units. Since, however, the French units are much easier to handle in calculations, and since they are being adopted all over the world, we shall use them in the figures obtained from the work of the progressive German clayworkers' organization. If any one wants the figures in terms of the English system he need only multiply the numbers by four.

The number of heat units used in burning is referred both to the quantity of clay represented by 1,000 German brick, size 10x4.8x2.6 inches, which take up a volume of 72.2 cubic feet, and to a kiln space of one cubic meter, 1.31 cubic yards. In this way we can not only obtain an idea as to how much heat is used for a given volume of clay, but also for a given kiln space, the latter feature being quite useful, since it is an easy matter to figure out the cubic contents of a kiln. The two values, referred to volume of clay burned and to volume of kiln space filled with clay in the shape of brick, under ordinary conditions of setting, should centainly prove interesting and valuable to all interested in burning.

Since in burning, the temperature plays an important function in the consumption of heat, it is necessary to know the temperature of burning, which is expressed either in degrees as registered by a pyrometer or, more practically, by Seger cones. The following table gives the theoretical amounts of heat required for burning 72.2 cubic feet of brick and 1.31 cubic yards of kiln space, filled with brick, at different temperatures. Before we can compare the results of burning in different kilns, etc., it is important to know how much heat is theoretically required, and although we can never hope to exactly reach the ideal minimum consumption of heat, yet it serves as a standard of comparison, and as such it is extremely important.

—Theoretical Consumption of Heat.—

TEMPERATURE.	Calories per Thousand Brick. 10" x 4. 8" x 2.6" 72.2 cubic feet.	Calories per Kiln space of 1 cubic meter, 1, 31 cubic yards, representing 21.1 cu. ft. of brick.
900° C, Cone 011....	832,410	249,852
1,000°, Cone 07.....	924,900	277,614
1,100°, Cone 02.....	1017,390	305,375
1,200°, Cone 4.....	1109,880	335,837
1,300°, Cone 9.....	1202,370	360,898
1,400°, Cone 14.....	1294,860	388,659
1,500°, Cone 19.....	1387,350	416,421

In calculating these values there has been assumed that the air used for combustion is not preheated nor that the brick are preheated by waste heat.

Let us now look into some of the figures obtained from ac-

tual practice and first consider the results from brick yards using the lowest temperatures, between cones 09 and 011. It was found that one cubic meter of kiln space, filled with brick, consumed, on the average, from 230,000 to 300,000 calories in the Hoffmann continuous kiln, at these temperatures, which corresponds quite closely to the theoretical values shown by the table. Most of the Hoffman kilns, under the conditions of temperature named, showed a consumption of 250,000, 285,000, 260,000 calories per cubic meter, but there were exceptions, due to bad burning, etc., in which the number of calories amounted to 425,600 and even 562,800.

At a somewhat higher temperature, at about 1010 degrees C., cones 06 and 07, the consumption of heat was much greater, up to 350,000 calories and above. At cones 06 and 05, about 1040 degrees C., some brick yards still got along with 350,000 calories, but others consumed 700,000 per cubic meter. In these values there must be considered that the amount of water contained in the brick when set in the kiln is of great importance, since 10 per cent. of water, for instance, requires about half of the theoretical amount of heat necessary to burn the brick. The figures mentioned so far refer to the Hoffmann continuous kiln.

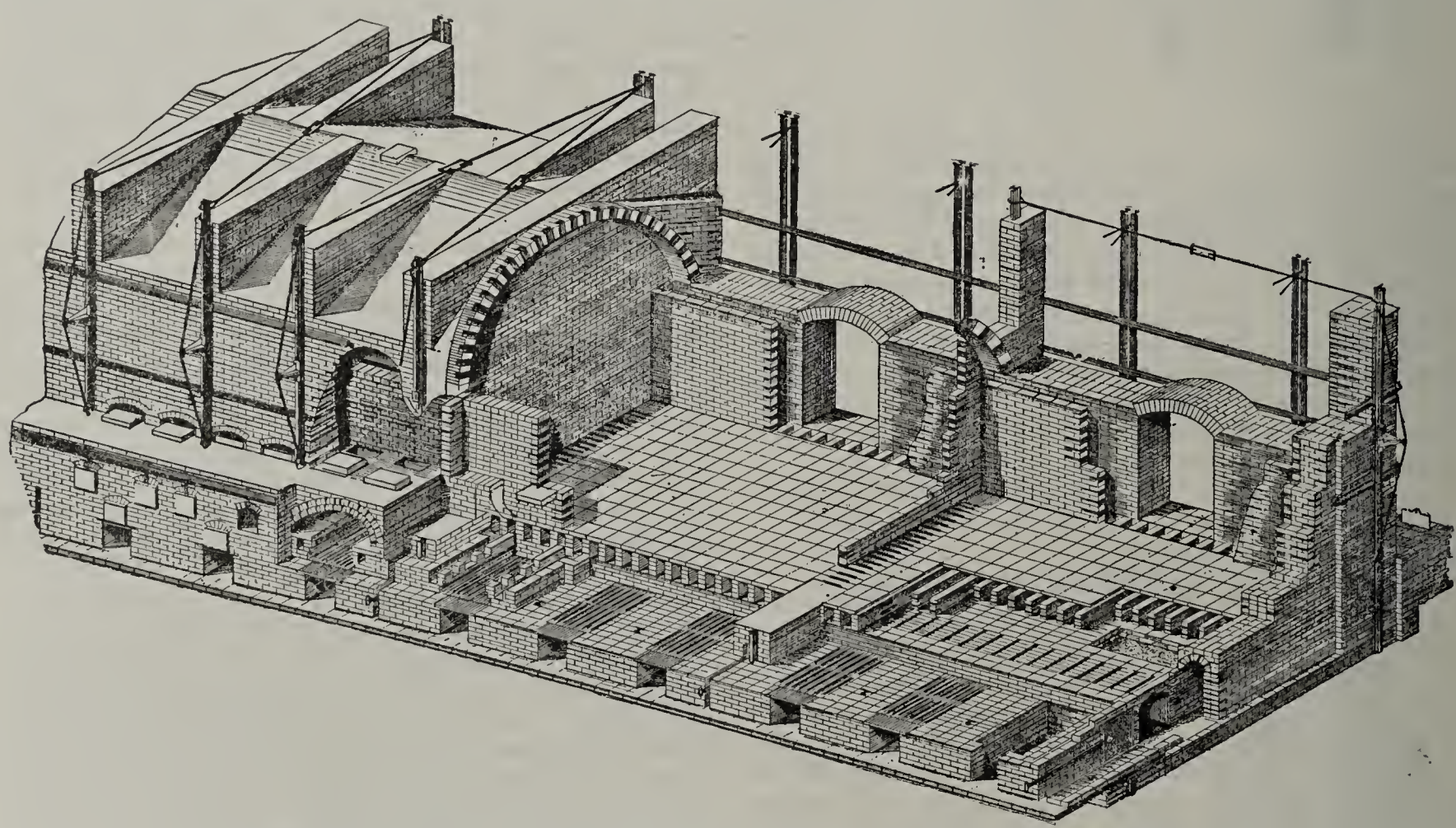
That the Hoffmann kiln is not the most economical kiln known was proven by obtaining the heat consumption of a Bock tunnel kiln. In this kiln, at a temperature of cone 06 and with gas firing, which always occasions a considerable loss of heat, 330,220 calories per cubic meter were used. This kiln also was a very old one, having been in use for thirty years. This is an instance where the advantages of burning with gas, clear colors and easy regulation are combined with great heat efficiency.

Transferring our attention to higher temperatures, there are shown us figures which are quite instructive. In a Dannenberg continuous kiln, at about cone 2, 1160 degrees C., the heat consumption is 346,497 calories, a very good result. In another continuous kiln, at a slightly higher temperature, the consumption is 729,000 calories, burning face brick. These two instances show quite distinctly how the same kind of kiln may be handled good or indifferently.

A surprise awaits us in the results of the continuous kiln fired with gas and used for burning fire brick at high temperatures, about cone 16 or approximately 1415 degrees C. The heat consumed in a kiln of this type, the Mendheim system, is 764,140 heat units per cubic meter (1.31 cubic yards) of fire clay ware, which, of course, represents a much greater kiln space, about 1.7 cubic meters, or 60 cubic feet, if it is in the shape of brick. The result obtained in this kiln is extremely favorable, the more so since with the use of gas the loss due to the generation of gas and to the radiation in conveying the gas through flues is quite considerable. Likewise a large flue system beneath the kiln must be kept heated at the expense of fuel consumption. Nevertheless, the investigation shows that the gas-fired continuous kiln is a very economical one in addition to the benefits derived from the use of gas as fuel.

In the periodic kilns, that is, the ordinary up-draft and down-draft kilns, the consumption of heat is, of course, very much greater than in the continuous system. In an up-draft kiln the consumption of heat units per cubic meter of kiln space (21.1 cubic feet of brick) was 592,237, at a temperature of cone 08-05, about 1030 degrees C. At cone 03 to 04 (1080 degress C.), in a down-draft kiln, 1,134,484 heat units were used up per cubic thousand of kiln space; in another one, at cone 1-2, 1,350,000 calories. The consumption of heat drops down remarkably if, in place of brick, tile or sewer pipe are burned, owing to the decreased weight per cubic meter. In burning sewer pipe made out of fire clay, in a down-draft kiln, at a temperature of cone 10-11 (1340 degrees C.), the consumption of heat units was 702,051 per cubic meter of kiln space.

These figures show us how near our kilns come to the theoretical conditions, and they also give us limits by means of which we can decide as to whether the kilns are doing good or poor duty. However, the most striking fact brought out is, that, no matter how good a kiln is in itself, it may prove economical or wasteful according to whether it is in the hands of a good or poor burner. The personal factor of the burner is of extreme importance; he should be a man of judgment, who does not shirk work and who thoroughly understands the principles underlying the burning process.



Ground Plan of Grath's Patent Combined Radiating Floor and Direct Down-draft Continuous Kiln.

The question might now possibly arise of how to convert our coal consumption into calories, or heat units, per cubic yard of clay, of kiln space, or per thousand brick, or whatever basis we might choose to adopt. It would be a task much beyond the limits of this paper to go into the detailed account of how heat is spent in a kiln. Summing up briefly our heat account is as follows:

The sum total of the heat—

1. Carried out by the products of combustion through the stack.
2. Carried out by the excess of air.
3. Rendered latent by the vaporization of water.
4. Carried by unburnt gases.
5. Lost by incomplete combustion.
6. Utilized in burning the brick.
7. Loss by radiation and conduction is equal to the heat contained in the fuel.

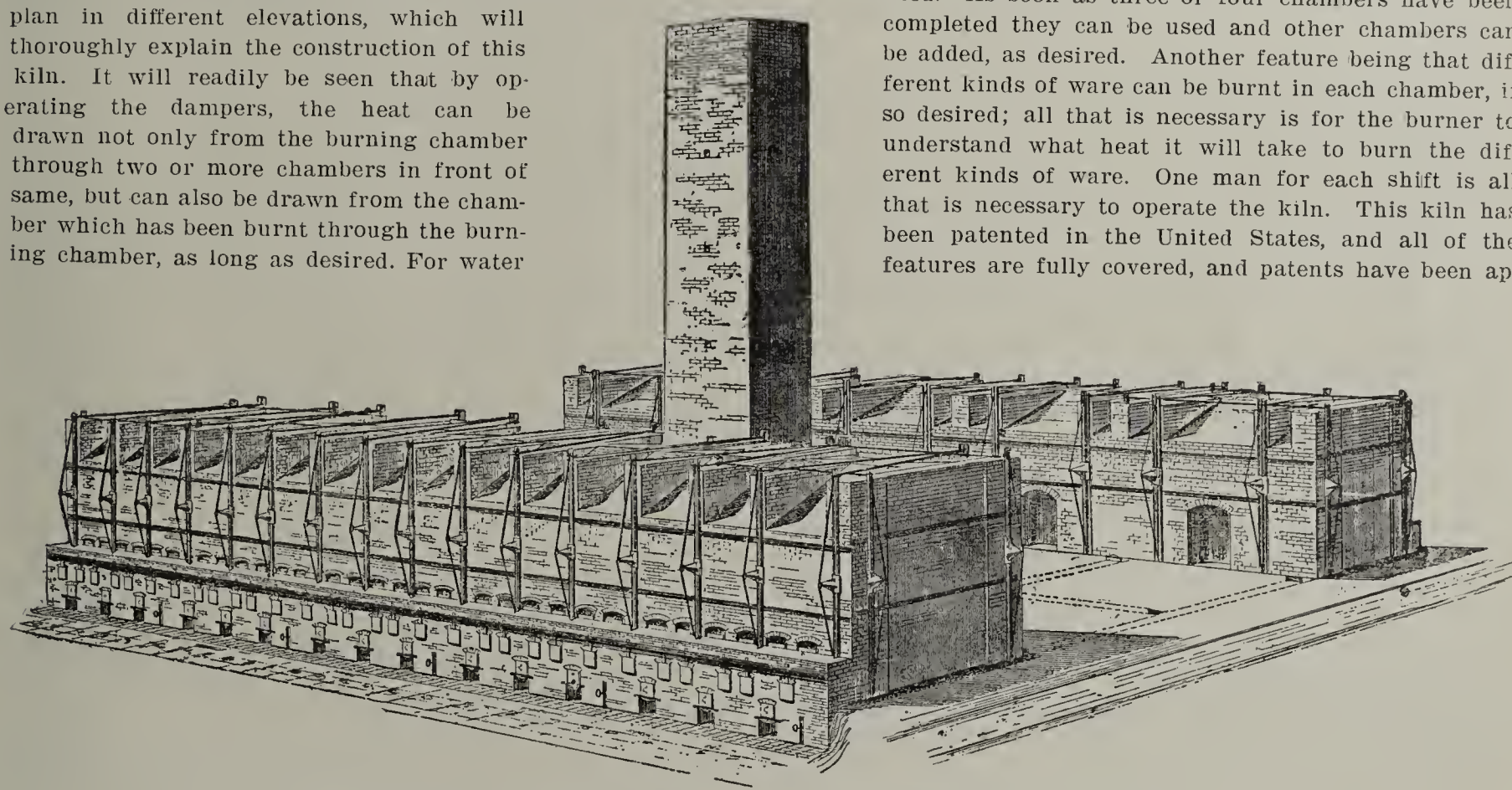
It is not a very easy task to thus make a heat balance of a kiln and require a certain knowledge of the technical points involved. However, anybody can convert the fuel consumption of his kiln into heat units with but little trouble. The first thing to be done is to obtain the heating value of the fuel used. This can readily be determined by any chemist or expert, or, in fact, by anybody in possession of a good calorimeter, like Mahler's bomb calorimeter. This calorific value

will be expressed in calories, that is, it will be the number of heat units per kilogram (2.2 pounds) of fuel. The next step is to find out the exact amount of coal used per kiln containing so many cubic yards of brick or cubic yards of kiln space. Knowing the number of pounds consumed per cubic yard per ton, per thousand or any other standard, dividing by 2.2 and multiplying by the heating value of the coal in calories will give the number of calories unit of comparison adopted. By putting Seger cones into the kiln and determining the average kiln temperature it will be possible to compare the heat units consumed with the theoretical heat consumption for that temperature.

AMERICUS.

A NEW CONTINUOUS KILN.

WE ARE PLEASED to present to the readers of The Clay-Worker cuts of the Grath Patent Combined Radiating floor and direct down draft continuous kiln, which he claims to be the long-sought-for perfect kiln, and judging from the construction, it certainly looks as if his claims for the "perfect kiln" may be well founded. The one cut shows an outside elevation of the kiln, having five chambers in each row (the full size kiln should be composed of eight chambers in each row).) The other cut shows a ground plan in different elevations, which will thoroughly explain the construction of this kiln. It will readily be seen that by operating the dampers, the heat can be drawn not only from the burning chamber through two or more chambers in front of same, but can also be drawn from the chamber which has been burnt through the burning chamber, as long as desired. For water smoking as much of the heat as is necessary for this process can be drawn into the chamber, the surplus is drawn up the stack. The firing is all done on one side, with furnaces on the outside, as in the down-draft kiln, the furnaces attached to the kiln are the Grath patent gas and coking furnaces, whereby the burning can be done with the cheapest kind of coal, commonly called slack or screenings, and as this furnace is a smoke consumer, there will be no smoke caused in the burning process. By the use of these furnaces, flashing and discoloration is a thing of the past, thus assuring a good colored ware throughout the chambers, as will readily be seen from the construction of the kiln and furnaces, that although the firing is done from one side, the heat can be thrown to both sides by simply operating the dampers over the furnaces. When the dampers are closed entirely, all of the heat from the furnaces, as well as all of the waste heat from the burnt chambers, is drawn into the flues under the radiating floor, up the bag on the opposite side and then down through the ware. If the dampers are open all the way, the heat takes the shortest course, goes up the bag on the side where the furnaces are and then down through the ware. If the dampers are closed partly, part of the heat from the furnaces is drawn directly up the bag and down through the ware, the balance of the heat, as well as the waste heat from the burnt chambers, is drawn into the flues under the radiating floor and then up the bag on the opposite side. Thus it will be seen that the heat can be directed to any part of the chamber whenever desired, which will result in a uniform burning of the ware. The waste heat alone from a burning chamber will heat up the ware in the next chamber to a red heat throughout the chamber, so that it will be seen that this continuous kiln has the same advantages of the saving of time, labor and fuel as other continuous kilns, but the quality of the ware, both in the uniformity in the burning and the color, will be improved over the ware burnt in any other continuous kiln. Should slack coal be scarce at any time, pea, nut or mine run coal can be used to equal advantage. With this kiln whitewashing of the ware is entirely done away with, as the water smoke from the drying chamber is drawn directly into the stack. Another advantage in this kiln over other continuous kilns is, that it is not necessary to build all sixteen chambers before any of them can be used. As soon as three or four chambers have been completed they can be used and other chambers can be added, as desired. Another feature being that different kinds of ware can be burnt in each chamber, if so desired; all that is necessary is for the burner to understand what heat it will take to burn the different kinds of ware. One man for each shift is all that is necessary to operate the kiln. This kiln has been patented in the United States, and all of the features are fully covered, and patents have been applied for in Canada, England, France and Germany. It is recommended that all parties desiring to secure perfect results at a minimum cost, will open correspondence with the Illinois Supply and Construction Company, who are placing this kiln on the market.



The Grath Patent Combined Radiating Floor and Direct Down Draft Continuous Kiln.

GRINDING MACHINE WANTED.

Editor Clay-Worker:

We remember seeing in The Clay-Worker a machine or stand with emery wheels, for grinding vitrified brick or facing same. Have looked over all the back numbers to find the advertisement, but are unable to find it. Kindly send me the address of the makers, or The Clay-Worker that had the ad., and it will be very much appreciated.

Enclosed find $2 to renew The Clay-Worker, which is a welcome visitor.

Ottumwa, Ia. C. T. McCARROLL.

Written for The Clay-Worker.

PROSPECTING.

What Happened to Richardson—Being a True Narrative of a Brickmakers Travels.

SINCE November first my time has been my own. For twelve years, I have been constantly employed on an Ohio brickyard in the capacity of superintendent or general manager—a position that commands all of a man's time, as the care and responsibility never cease. Before assuming such responsibility again or making another engagement in the brick business, which engagement, I expect, will be for the balance of my life, I decided to go a-visiting and prospecting. So, on the morning of November 6, having settled up my affairs and relieved myself of all anxiety about brick coming out the desired shade or being delivered on time, I deposited my Australian ballot, with a firm conviction that the result of the election would be for the best interest of all of us, or in any event, willing to take my chances with the majority, I set out upon my travels without note-book or camera. I arrived in

—Cleveland—

in time to hear the election returns and rejoice that the country had been "saved" again.

To the brickmaker the most interesting development in Cleveland is in the manufacture of shale brick. Cleveland is situated above beds of shale a thousand feet thick, more or less, and higher strata of shale are found and worked on the ridges south of the city. Not many years ago one would have been ridiculed for stating that this shale would be used for the making of brick. And while to-day most of the common brick are made from the drift clays, yet as these are being used up or occupied in the city, brickmakers are moving outside and locating upon the inexhaustible shale beds, where they can make, not only common building brick, but also sewer brick and pavers.

To make such a change means for the Cleveland brickmaker a change of process of manufacture, from the soft-mud to the stiff mud or dry press, and also the construction of closed kilns. Since shale brick must be hard burned, and in this case at much higher temperature than the soft mud clay brick, the ordinary up-draft or clamp kiln is not practicable, and since down-draft or continuous kilns cost a lot of money, only those having large capital can engage in the manufacture of shale brick.

Our friend, ex-President Eggers, has in the past year moved out and established a shale brick plant and has experienced some of the difficulties of the change of material and process. He has lately incorporated into a stock company and will secure additional capital and build down-draft kilns and make paving brick.

In the suburbs of Cleveland are other shale brick plants that, after a period of adverse experience, have for the past few years been in successful operation—the plant at Collinwood, in charge of Mr. John Candler; the plant at Wickliffe, reported in the November Clay-Worker by Superintendent Robert Twells as having run for the past two years and seven months without a shut-down, and the plant of the Cleveland-Canton Paving Brick Co., near Willow, which I hear was burned last week.

In addition to the above should be mentioned the works of the Cleveland Hydraulic Pressed Brick Co., at South Park, which have been so successfully managed for several years by William H. Hunt, president of the Cleveland Builders' Exchange. Here are manufactured the famous "Akron" red-face brick. The Bedford shale, from which these brick are made, outcrops in a few places on the hills south of Cleveland on both sides of the Cuyahoga valley, and is a remarkable formation—a soft shale of a red or chocolate color, with occasional greenish streaks, that burn uniformly to a brilliant red, entirely free from white or black specks, with a good workable distance between the points of vitrification and viscosity, thus being an ideal material for the manufacture of an impervious face brick.

This Bedford shale, though an extensive formation, is only accessible for manufacture in a few places. I investigated this material several years ago, and selected a location that I believed had superior advantages—fine building site, plenty of room on level ground, with good drainage and excellent water supply for boilers, near the railroad and within switching limits of the city. I looked over the available points again, and secured an option on this property, and spent a week prospecting it with auger, pick and shovel, finding, as I expected, an abundance of the Bedford shale, also of the Cleveland shale, such as is used for pavers, good yellow clays and sand, and two veins of valuable stone, all above the level of the factory site. Not wishing, however, to decide upon locating until I had investigated opportunities elsewhere, and the weather being cold, with high winds and snow, I contracted with the Big Four and Queen & Crescent to transport me forthwith to warmer climes, and inside of thirty-six hours I was put off at

—Rome, Ga.—

where I was immediately taken in charge by Mr. H. H. McClune and his associates in the Rome Brick Co., and for the greater part of two days was much interested not only in watching the operations in their brick plant with the cheap and efficient negro labor, but also in viewing their active little city. The situation of Rome, between two rivers, which I can neither spell or pronounce, but which unite to form the navigable Coosa, the conical pine-clad hills, upon one of which is the beautiful city cemetery, the wide variance in the habits and habitations of the two distinct races that seem to be about equally numerous, the products and industries peculiar to the region—all present a picturesqueness to a Northern man that makes a visit there full of interest and long to be remembered.

The brick plants of Rome were well described and illustrated in The Clay-Worker of January, 1897, and are much the same to-day, with the addition during the past year of a large tunnel dryer, built by the American Blower Co., in place of the old system of hot floors, and the construction of another Eudaly kiln, and, alas, greatest change of all, the removal by death of the former manager, who made the Rome Brick Co. famous, our lamented friend, ex-President R. B. Morrison. I had the pleasure of meeting Mrs. Morrison and one of her sons, who is in business in Rome, and of hearing many kind words spoken of them, and of the man we knew and loved so well. From Rome to

—Chattanooga—

where I arrived Saturday evening, is only about three hours' ride. Here I have valued friends, made before I ever knew a brickmaker, and am always sure of a warm welcome. Sunday was a beautiful day, and I enjoyed a ride out to Forest Hill Cemetery, where lies buried my college chum, the dearest friend of my youth, and thence to East Lake.

I had in mind to visit the Chattanooga Press Brick Works, but the proprietor, Mr. H. A. Winters, is a Baptist deacon, and would not go to the factory on Sunday, though he called upon me, and our conversation, doubtless through my evil influence, drifted into worldly matters. I have observed before that the people of the South are more religious, some might say also more superstitious, than the people of the Northern States. The churches are better attended and the pastor's influence is more marked.

In Rome the foreman of the yard was not allowed to have any work done on Sunday, not even to run the blower for drying the brick, and any bad luck at the works is attributed to some infraction of Sunday observance.

Leaving Chattanooga Sunday night, I spent Monday in

—Cincinnati—

where my first encounter was on the street with a man whom some of your readers may know, Mr. W. A. Eudaly, the first president of the N. B. M. A. As we both had other appointments, we could only exchange a few words. Eudaly is never pessimistic, but always cheerful and encouraging, and it was pleasant to hear him speak in his usual cheery and wisely indefinite and mysterious manner of some big enterprises that were developing for the coming year, the success of which would be assured by the adoption of the Eudaly kiln.

I took an hour or two from my other affairs to go out to Winton Place to see the new roofing works, which are in

charge of my young friend from the O. S. U. Ceramic School, Mr. W. G. Worcester. He is an enthusiastic clayworker, and is going to make his mark in his chosen line—roofing tile. His good taste and judgment and confidence in his future has lately been shown by his taking unto himself a wife, one of the fair favorites of Bloomington, Ill. I found him in his laboratory, making an analysis of clay, in order to adapt to this body his various tile glazes.

The distinctive product of this factory is a Spanish tile that will form a perfect lap-joint—the slight variation in curves by the varying thickness of the tile in order to produce this result is said to be an invention of the president of the company.

From the Queen City I made a big jump and landed on Manhattan Island.

—In Greater New York—

for the purpose of investigating the clay of Staten Island and New Jersey.

To see the clays of Staten Island I was fortunate in having as a guide Mr. William Lenderoth, who has been connected with several large brickmaking establishments about New York, and who built and operated the well-known works of B. Kreischer's Sons, at Kreischerville.

Mr. Lenderoth owns and occupies one of the elegant residences built by the Kreischers, only a few rods from their factory. Near this factory is the factory of the defunct Anderson Pressed Brick Co. The former is in operation and the latter, I was informed, had just been purchased by a Mr. Wheeler.

Mr. Lenderoth has a fine clay property, with water front on Staten Island Sound, which he offers to put into a stock company for the manufacture of face brick or fire brick upon very reasonable terms. The location of the property, the light stripping and the depth and quality of the clays, and likewise the expert knowledge of Mr. Lenderoth should be a valuable and profitable investment for capital.

I did not attempt to enter any of the factories there, as my time was limited and I expected to return. However, I stopped at the Kreischer clay bank, and saw them stripping and carting away for dump 45 feet of sand and gravel to get an 8-foot vein of clay, which clay they were hauling in carts through the streets to the factory.

For information of Jersey clays to whom should I go but to our friend, Mr. Charles A. Bloomfield, the well-known clay expert, and the largest miner and shipper of clays in the county. Mr. Bloomfield, though he now lives in Brooklyn, was born and bred in Jersey, as were the Bloomfields before him for several generations, the family being one of the first settlers of Middlesex county. The fine, large family homestead owned by Mr. Bloomfield is only a short distance from his clay banks.

I have seen quite a good many clay banks, but never anything to compare with Bloomfield's. Here one can actually see sixteen different clays, including a white fire sand, each being shipped as demanded, and the wide range of colors and distinct demarcations make an interesting and puzzling study. A few days later I had some experience in boring for clays on another property, farther up the Raritan. I put the auger down to full depth, 12 feet, into a beautiful red plaster clay, without getting to the bottom. Fifteen feet from this hole I bored in the same manner and found nothing but a white clay.

However, the nearness to the largest markets and the superb shipping facilities by water and rail, as well as the fine quality of some of these irregular deposits, are advantages many Jersey manufacturers do not seem to fully appreciate.

If your space would permit, I would like to speak further of my experience in Jersey and of the kind hospitality of Mr. Bloomfield, but I must hasten on my journey.

—New Haven.—

This was a side trip, not on my programme, but brought about in this way: Here comes to New York one Sunday afternoon by boat from Old Point, Secretary Randall, and proposes that Bloomfield and I accompany him over to visit the New England brethren. So we took an express train Monday morning for New Haven, known to the readers of The Clay-Worker as the habitat of the Eastern Machinery Co., manufacturers of soft clay brick machinery. J. Wheaton Stone, the affable manager of the factory (and its large and well-equipped foundry and machine shops), extended a cordial welcome and promised on our departure to see us later at Old Point Comfort convention week.

About noon we boarded another train and were soon at North Haven, a suburb of the older city, where we were greeted by our old friend, Frank Stiles, who, not informed of our coming, had gone out there to his brick works. We were shown over the yard, though closed for the season, and noted the thrifty Yankee business methods, everything put away in good order for the next year, and a machine shop and woodworking shop connected with the establishment, making repairs upon tools and machinery, as well as making new wagons of special design, with wide tires. They actually make in this shop all of the wagon except the axles, and also make their own brickmaking machinery.

The kilns of brick—common soft-mud brick in open clamp kilns—showed the most uniform work in making and burning I have ever seen.

After looking over the yard we were given evidence that Mr. Stiles is an admirer and judge of good horses, as he drove us back to New Haven, a distance of about seven miles, stopping at another of his brickyards and also at that of Mr. Davis, who thence assisted Mr. Stiles in showing us various points of interest, including Yale University and the best residence streets.

We called at the home of an old friend, Capt. Crafts, but he was out of the city, and we were sorry to miss seeing him.

After refreshments at the Union League Club we were driven to the station, well pleased with our trip and the courtesy shown us.

—New York to Old Point.—

The next place I wanted to prospect was Richmond, Va., and decided, at Randall's suggestion, to go there by boat via Old Point.

As some of your readers will doubtless take this route to the convention in February, it may be interesting to know something of my experience, which was rather exceptional.

It was rather an uncomfortable afternoon. The weather was cold and rainy, with a wind that made it almost impossible to hold an umbrella. At 2 o'clock Randall and I arose from a hearty dinner, mostly of sea food—oysters, clam chowder, fried scollops and bacon, etc.

At 3 o'clock I sailed on one of the splendid steamers of the Old Dominion Line. At 5 o'clock we were outside in a strong northeast wind, which soon increased to a gale of about 100 miles an hour, more or less. The ladies had disappeared from the cabin and the men were beginning to get white behind the ears and move towards their staterooms.

At 5:30, having some regard for the furnishings of the cabin, I staggered to my room and threw myself upon my berth and immediately began emptying my stomach into the tin receptacle hooked upon the side of the berth for that purpose. Twice I rang for a servant to empty the dish, thus giving up to the sea all that I had taken from it at the New York restaurant—and more.

After about two hours of this I felt better, and went out in the cabin for company, but could find only one passenger, and, as the boat was plunging and rolling so that I couldn't stand or walk, I decided to go back and hang on to my berth. About midnight the storm abated and a full moon arose, making a picture long to be remembered by a landsman.

We arrived at Old Point three hours late, but it didn't matter, as I was not to leave for five hours. A good breakfast on the boat and luncheon at the Hygeia put me in good condition, and I could look back upon my experience of the night before with pleasure, the only regret being that I did not have Randall with me.

One might make a hundred trips on this line without encountering such a storm, but as a wise precaution I would advise voyagers not to go aboard with a full stomach.

—Richmond.—

From Old Point to Richmond, via the C. & O., is a ride of a little more than two hours. As all tourists who want to see Richmond stop at the Jefferson Hotel, I went there. The hotel is a work of art, constructed of brick and terra cotta, and is itself worth a day's stop in the city to see. The rates are high, but it is said not high enough to pay expenses, so the wealthy tobacco man, Mr. Ginter, who built it, provided an endowment to keep it running. It is reported that just before he died Mr. Ginter declared that he had made two great mistakes in life—one that he never married, and the other that he built the Jefferson.

The citizens of Richmond would not agree with the latter

statement, since the Jefferson brings to their city every year a large number of wealthy tourists.

This Mr. Ginter left his property to his adopted son, Mr. Pope, who is said to have been an excellent man of business, but who died at the age of thirty-two, having had a bad dose of the brick business. He was the owner of the Powhattan Clay Manufacturing Co.'s establishment. I do not know that he started this, but if he did, he surely made one great mistake himself. I did not go out to the works, about twenty-five miles from Richmond, as the trains run inconveniently, requiring a whole day for the trip. It is said that they were humbugged at the start by the sample brick game, and that when the works were ready for operation no clay could be found. What are known as the Powhattan brick are made here of clay shipped from North Carolina.

A short stop in Washington and Baltimore ended this pleasant, if not profitable, prospecting tour.

In Baltimore I spent a few hours with Mr. Joseph R. Wilson, president of the Baltimore Brick Co., the combine, who, together with Mr. Wanamaker, is promoting a paving brick establishment.

The next day upon getting on the train at Laurel, where I had been to look at some clay lands, I met Mr. Miller, the well-known brick manufacturer of Washington, who very kindly entertained me at his home for a few hours before my train left for the West.

Nearly every brickmaker I saw expects to attend the convention, and I am looking forward myself to another trip (by rail) to Old Point in February. I know from former visits there that it is a delightful place to visit at all times and that it will be doubly so when we of the N. B. M. A. meet there in a body. W. D. R.

U. S. POTTERS' ASSOCIATION.

—Annual Session.—

THE UNITED STATES Potters' Association convened in annual session at Hotel Henry, Pittsburg, Pa., on Tuesday, Dec. 4, and continued in session until the following day. President Charles W. Frenzheim, who is also president of the Wheeling Pottery Company, presided. Vice-President James Moses, of Trenton, N. J.; Treasurer George Goodwin, of East Liverpool, O., and Secretary H. A. Kaffer, of East Liverpool, were also present at the meeting, as were a large delegation of the leading manufacturing potters of the country.

After a formal meeting on Tuesday morning, at which there was a roll-call and the appointment of committees, the meeting adjourned for lunch. The afternoon session was a busy one and did not adjourn until 5:45. There was a spirited discussion upon the wage question, but the wage committee was given no instruction to meet that of the Brotherhood of Operative Potters, and it is understood that no such conference will be held this year. It was claimed in the meeting by some of the speakers that the Brotherhood was not enforcing the wage scale which went into effect May 1st, and that there was no assurance that it could enforce a revision of the existing scale. In the matter of wages concerted action was not reached and the matter was allowed to rest without settlement. The employment of many non-union operatives in different potteries and the disregard of the agreement for these was the cause of the hitch among the manufacturers. The associated potteries employ about 8,000 operatives and less than half of these are members of the Brotherhood.

In spite of the deadlock on the wage question, the operators apprehend no danger of a strike, for the present agreement remains in effect indefinitely. Both the Brotherhood and the manufacturers are anxious to avoid anything like the labor troubles of 1894, which were so ruinous to the trade and to the employes.

The committee on freight rates was instructed, after it had made a report, to continue in its efforts to induce the railway traffic men to readjust the present high rates to better advantage the American pottery trade. During the past year this committee succeeded in getting no concessions and, save a rebate of 20 per cent. of the freight charges, which was equal to the increase caused by the action of the railroads in raising pottery wares from fourth to third-class freight, and at the meeting talk was renewed of having the matter taken up by the Interstate Commerce Commission. It was asserted in the convention that British pottery could be put down at St. Louis from Liverpool, Eng., on vessel and rail, freight charges netting two cents per hundred pounds, less than those charged the East Liverpool, O., potters for deliveries to the same place.

Among the interesting features of the convention were the reports of the various committees, all of which showed the trade to be in a very prosperous condition, and promised a marked increase in the volume of business during the coming year.

A report from Consul Griffin, stationed at Limoges, who had been appointed by the President to investigate the condition of the potteries of Europe and report to Washington, was made by Consul Griffin in person. In his address he showed the many advantages which American potteries have over those of Europe. He said that the tariff of 60 per cent. was almost a prohibitive barrier to foreign pottery products, and that in addition to this the foreign potters had to contend with the high coal rates.

The report on the condition of the pottery industry in this country showed that there are 623 large kilns employed, and of these 606 are in active operation. During the year 576 kilns have been in continuous fire and 39 new ones have been built. The value of the year's output was $15,500,000, and the industry during the year furnished employment to 17,000 persons.

East Liverpool, O., potters, most of whom are fully complying with the wage scales which went into effect last May, made a strenuous effort to have the convention recommend price advances, but were blocked by the association. It will now remain for the white granite compact, which regulates pottery discounts, to make any changes or advances desired. This compact makes its discounts on an agreed list tabulated in pounds sterling, similar to the British list.

The following officers were elected for the coming year: President, Charles Howell Cook, Trenton, N. J.; First Vice-President, Joseph G. Lee, East Liverpool, O; Second Vice-President, James Pass, Syracuse, N. Y.; Third Vice-President, W. W. Wells, East Liverpool, O.; Treasurer, George S. Goodwin, East Liverpool, O.; Secretary, H. A. Keffer, East Liverpool, O. The new members to join the association were: Wellsville China Company, Wellsville, O.; Sevres China Company, East Liverpool, O.; Taylor, Leeds & Smith, East Liverpool, O.; E. M. Knowles China Company, East Liverpool, O.; Salem China Company, Salem, Pa.; Canonsburg China Company, Canonsburg, Pa.; Maryland Pottery Company, Baltimore, Md. Before the adjournment of the annual convention President Cook announced the permanent committee, and their chairmen, which are as follows: Executive, Col. John M. Taylor, East Liverpool, O.; statistics, William Burgess, Trenton, N. J.; art and design, W. E. Wells, East Liverpool, O.; machinery, Earnest Mayer, Beaver Falls, Pa.; kilns and fuel, James Pass, Syracuse, N. Y.; selling price, C. W. Franzheim, Wheeling, W. Va.; transportation, John A. Campbell, Trenton, N. J.; historical, George S. Goodwin, East Liverpool, O.; dinner and reception, William Burgess, Trenton, N. J.; auditing, Howard B. Moses, Trenton, N. J.; membership, N. A. Frederic, East Liverpool, O.

IMPROVING THE OPPORTUNITY.

My small nephew was ready to start on a long-promised week's visit to his grandfather's in the country. There was an exasperating delay in the appearance of the carriage to take us to the station. The young man worked off his impatience in various annoying ways for half an hour, then suddenly he was seen to kneel beside a chair in the corner and bury his face in his hands. After a few minutes his mother said:

"Well, Kenneth, what are you doing?"

"Just getting my prayers said up for while I'm going to be out at grandpa's. There's nothing to do here, and I 'spect to be pretty busy while I'm there."—Harper's Bazar.

OFFICIAL ANNOUNCEMENT.

The Fifteenth Annual Convention of the National Brick Manufacturers' Association and the American Ceramic Association to be Held at Old Point Comfort, Va., February 11th to 16th, 1901.

AS PREVIOUSLY ANNOUNCED, the Fifteenth Annual Convention of the National Brick Manufacturers' Association and the Third Annual Meeting of the American Ceramic Society will be held at Old Point Comfort, Va., February 11 to 16, 1901.

—Convention Work.—

The Ceramic Association will hold its meetings Monday and Tuesday, the 11th and 12th. A special programme is being prepared and will be published in full in the next issue of this magazine. Those desiring same can obtain individual copies by addressing the secretary, Prof. Edward Orton, Jr., Columbus, O. All ceramists are cordially invited to participate in these meetings. The secretary, upon application, will be pleased to furnish blank applications for membership and full particulars as to the requisites of membership.

The sessions of the N. B. M. A. will begin Wednesday afternoon, the 13th, and continue throughout the week. The programme will include the usual number of instructive papers and addresses upon various subjects of vital importance to brick manufacturers. Members desiring information upon any feature of the business can have same included in programme by submitting it to the secretary.

—Hotel Headquarters.—

All the sessions of the convention will be held in Hotel Chamberlain which will be headquarters. It is generally conceded to be among the finest hotels in the world, and offers unexcelled facilities for convention purposes. A special rate of $3 per day will be made to delegates and those accompanying them. Those who may want to stay longer than the week of the convention will be granted the same rates so long as they remain at the Chamberlain. The special rate applies only to ordinary rooms occupied by two guests. Individuals wanting rooms to themselves, or those wanting parlors or rooms with bath, will be charged $4 per day and up, according to location, etc.

—Reduced Railroad Rates.—

Have been secured on the certificate plan: That is, delegates and those accompanying them, if they pay full fare going, and TAKE PROPER CERTIFICATE for same from the ticket agent, will be entitled to return ticket at one-third the regular fare, making two-thirds rate for the round trip. This covers all territory east of the Mississippi River. Those coming from points beyond this should use their local mileage to points on the east side of the river and there repurchase, taking certificate, as stated above. In that way they can obtain the two-thirds rate from river points to the convention. Those starting from small towns should make inquiry of local ticket agent a few days in advance to insure the receipt of proper certificate. If certificates are not taken, the reduced rates cannot be secured. As it takes some little time to make out certificates, delegates should present themselves at the ticket office at least thirty minutes before the departure of trains. Return tickets will be good four to ten days after adjournment. The latter limit has been asked for to enable those desiring to do so to stop at the National Capital on the way home. The splendid steamships plying between Old Point Comfort and Washington run the year around, as do also the boats to Baltimore, New York and other Atlantic coast points. These afford opportunity for delightful side trips.

A Glimpse of one of the Parlors of Hotel Chamberlain.

—Exhibition Room.—

Those desiring to exhibit specimen brick, light models of machinery, etc., will be afforded excellent facilities free of charge to members. Those desiring space are requested to notify the secretary, stating character of the exhibit, amount of floor space desired, etc.

Every indication points to an unusually large attendance. However, the hotel accommodations are such as to insure satisfactory accommodations for all who attend. The programme which is being prepared and will be given in full in the next

Clay-Worker, will provide for special social features, in which the ladies are expected to participate. All sessions of the convention are open to the public. Clayworkers who are not now members will be welcomed cordially. Those desiring information relative to membership, etc., are requested to write to the secretary at Indianapolis.

THE EXECUTIVE COMMITTEE.

THEO. A. RANDALL. W. D. GATES, President.

THINGS NOT ALWAYS WHAT THEY SEEM.

IT'S ALL RIGHT, sonny, to thump your enemy good and hard when he does something real bad to rile you, but don't go carrying 'round in your bosom the wicked delusion that every man who talks behind your back or before your face in a manner not pleasing to you is your implacable enemy. I knew two brickmakers once who operated yards side by side, and if ever two men fought through their lives it were those two men. They skinned each other behind backs and face to face they came near to blows at nearly every meeting. But once my eyes were opened to the fact that all this noise was not the real feeling of either man. One of the men died and left his financial affairs in a bad way. He left a good plant, and the men who scented a chance to get a good snap were gathering to take advantage of the widow's plight. Now, these men had under-cut each other on prices all through life; had thrown obstacles in each other's way and had stolen contracts from one another with open expressions of satisfaction. But when the dead man was laid in his coffin then came his adversary and wept like a child above his remains. All enmity, all bitterness, all reproach were gone. And the living rival did more than the world expected. He encouraged the son of his dead rival to hold the plant and continue his father's business, and backed his encouragement with the substantial dollars.

Now, when a man says a real mean thing about me behind my back I think of how he used to talk and how differently the noble heart within him spoke when the test came—and I forgive my detractors.

* * *

There were two others that I know who were rival brickmakers in early days, when men were rougher than they appear to be nowadays. The words thief, swindler, robber, cheat, were common expressions used by one as descriptive of the other whenever the conversation turned upon personalities. And I know that when business carried one to a distant town where, unknown to him, his friend had made figures on a contract, he blacked both eyes of a native who found fault with his neighbor's brick and spoke disparagingly of his honor. When the story came back home after him he felt so cheap about it that to square himself he walked half a mile out of his way to tell the man whose name he had so valiantly defended that he wasn't worth defending, that he was too big a fool to be a thief and too cowardly to be dishonest, so that he was only a big, blundering lubber, anyhow. But I can't say that I fully appreciate the character of that champion of his townsman.

* * *

The beginning of it has ever since been enveloped in haze to me. Where that great group of jolly companions had come from I know not, no more than do I know whither they went after I was so suddenly removed from among them.

But we were the pleasantest collection of male humanity that ever congregated. There was no noisy talk or rude motion. We were with each other in the light of a burning kiln of brick and some one was talking.

"See here, boys," he said, bringing forward a huge machine somewhat covered with rust and the rime of ages. It was shaped like the harp, but in place of strings it had a plain board or metal face, set with knobs that in a measure resembled the keys of a cash register.

"This," continued the speaker, "is the richest archaeological discovery of the age. You have all heard of the strange game, which historians tell us was played by the ancient Egyptian mathematicians, and in which, it is said, many of them became so proficient that they were able, by means of it, to disappear and reappear among men as frequently as the mood took them. It is the secret of the Mahatmas of Theosophy to-day and accounts for the inability of the curious ones to locate that wonderful tribe."

The talk became exceedingly interesting and I drew closer to inspect the odd instrument. I ran my hand over the notes at random and they yielded as easily to pressure as a typewriter's keys.

The speaker continued talking while I, half listening, played up and down among the notes.

"When the combination of notes are pressed they are recorded on the ethereal film of the universe in figures. When the right combination is pressed the correct figure is marked on the ethereal film and the player is at once transferred from earth"——. Suddenly on the machine in black appeared the figures—00573.

Horror of horrors! The machine faded from my grasp like powder. The kiln and the crowd were gone. I felt myself flying swiftly and noiselessly, whither I knew not. I only knew that I was in swift flight and the world that I had known was far behind or below me. A soft singing noise, as of the touching of muffled harp strings, accompanied me in that dreadful flight. What it was I shall never know. For hours I flew with unchecked speed and without jar or oscillation until I reached a region of purest light, where the silence was the deepest and most transquillizing that ever mortal sense dreaming or waking imagined. I was now at a standstill in that great, pure light and soft, solemn stillness. I felt neither heat nor cold, nor air around, nor earth beneath, nor any object nor element that could or did impress a single earthly sense. It was peace in its most perfect degree, yet was I not at peace. A terrible, nameless fear was on me. A fear of nothing that I can ever recall; and of remorse. Oh, unspeakable, corroding, festering remorse for my unfinished work upon the earth and my untimely departure from my friends, and my work undone. My friends! How? What? Return to them? Never again. Send back some consoling message that would at least explain the cause of my mysterious disappearance from among them. Oh, the dreadful, pitiful pitilessness of the thought that never could we again exchange messages—never would they know my fate. Never would I know what fate was theirs. And oh, how horribly incomplete and wretched was the work of my life on earth. Nothing even well begun. Everything criminally neglected and wasted. And still I was alone in that soft, quiet light. Nothing disturbed its monotony and yet it was not monotonous to me. But the hopelessness of my position smote me as a sharp sword in my heart.

I recalled the last words of my companion as he described the machine. "They were able to disappear and reappear as they willed." But I had stumbled on the fateful combination that had removed me from the earth while I lacked the potential quality to bring me back. I wonder that the awful hopelessness of my position had not killed me outright. The tense emotion again wrenched me and in the depths of my despair I found my voice and spoke, "I am a lost man." A hideous chorus of fiendish laughter struck upon my ears, and fiendish as it was, it was in a certain sense welcome to me in the midst of that awful stillness.

Then a loud voice spoke: "No, you are not lost; you are all right." A window came before my eyes just then and I was looking out upon a beautiful bit of scenery—a cool, secluded nook between two huge buildings. The ground was bare, but beautiful to me, for ground was scarce in my present surroundings, and the bent and broken preserve cans that littered the surface were fairer visions to my sight than the tiara of the Queen of Sheba (if she had one). "You're all right," said the rude, loud voice again. I didn't like the sound of that voice. It didn't match the sweet calm of my surroundings. It nettled me exceedingly. "I know a dam site better. I ain't all right," I said, and then I came out of it. The dentist said I was the queerest case he had ever administered ether to.

* * *

I know of another man of whom it is said that he deliberately melted his neighbor's kiln when he was called to assist in the burning of it. Yet I saw the man cry over the misfortunes of the man whom he was supposed to hate. Man is a creature of impulses. Bad and good are forever fighting within us for supremacy. You have often in the heat of passion spoken words and done acts that even after the lapse of a score of years you would give much to recall. I have myself; so has

everybody. If we could only realize that the word spoken is so much worse than the heart behind that word what a world of charity and good-feeling would come about. Put yourself in his place is a rule too often neglected. THE DREAMER.

DETROIT BRICK NEWS.

THE DEMAND for December brick is very large; all the plants are kept busy supplying the market.

Architects report big business and that, so long as the weather permits, there will be no lull in the present heavy demand for all kinds of building materials.

On the New Year, it is doubtful if there will be left on the market 20,000,000 brick, where at the season's close there were fully 50,000,000 brick.

The Detroit Police Commission will build two new stations, one of which is under way, at an aggregate cost of $22,500. Mr. Lonyo will supply the brick.

Standard Oil Company have had plans drawn by Architects Clark & Munger, for a two-story brick warehouse, 52x72 feet in size. Work will be commenced immediately.

John S. Gray, president of the German-American Bank, has let plans for a block of five brick dwellings at an aggregate cost of $25,000. Work will be begun immediately.

John Brennan & Co., boiler manufacturers, will build a large brick addition to their boiler shop, 100x300 feet in size, requiring several hundred thousand brick. Ground has already been broken.

The Craft School, which was recently totally destroyed by fire, will be rebuilt at once. The Board of Education has decided that it be entirely of brick, of which it will require 600,000.

Some Detroit manufacturer will undoubtedly get the order for the brick for the new Ypsilanti public school. The plans which have been adopted provide for a building 61x73 feet and two stories high.

The National Biscuit Company have accepted plans and will commence to build, without delay, a spacious brick bakery, to cost $18,000. It seems probable that Clippert & Bro. will furnish all the brick.

Prices remain unchanged: Common, $5.00; sewer, $5.50, and stock, $6.00 per thousand, but there is a general feeling among mason contractors that the New Year will announce a fall in prices. Appearances indicate, however, that prices will remain as at present.

Indications are that the dryer is gaining favor among Detroit manufacturers. R. H. Hall and Stephen Pratt will both erect one at their plants early next season. Many more will, by that time, deem it advisable to be equipped with one. In my last letter it was stated that the Wolf Brick Company was the first to erect a successful brick dryer here. This, it seems, was an error, as the Clippert Bros. built an A. B. C. steam dryer just before the Wolf Company did and have operated it successfully all the past season. It has worked so well that they would not think of going back to the old sunshine method.

The American Car and Foundry Company have decided to erect a plant in this city, for the sole manufacture of steel carrying cars. The site is located in northwestern Detroit. To erect the buildings will require 1,500,000 brick, perhaps considerable over that amount. As yet we do not know who the lucky manufacturer will be to secure the order.

The Western Buffalo Robe Mills has decided to enlarge its plant. The firm has practically outgrown its present quarters, and as it has plenty of ground on which to build in connection with its present site, work will be begun on a large brick addition to the factory as soon as possible. Five hundred thousand brick will be needed.

The Detroit Board of Fire Commissioners have let plans for two brick fire engine houses, to be built immediately, at an aggregate cost of $26,000. The manufacturer that secures the order can count himself lucky, as the location of these houses are "near trips" and an "extra trip" could be easily made without injury to either man or beast, at the same time making a neat profit.

There has been a call for brick from Detroit manufacturers to be delivered to the interior of the State. One call came from Morrell & Morley, for upwards of 1,000,000 brick for the erection of a tin factory at Benton Harbor; another from Mr. Buysee, for 500,000 brick for an hotel at Kalamazoo. Whether any of the manufacturers will fill these orders remains to be seen, many having no more than just enough to supply their regular contractors.

Colonel F. J. Wecker will begin work on his residence immediately. It will be erected on La Salle avenue, in the La Salle Gardens. This is by far the most costly private residence erected during the year. It will be in the colonial style of architecture, having frontage of 40 feet by 64 feet in depth and two stories high. It will be built of uniform red stock brick, with Bedford (Ind.) limestone trimmings. The vestibule, including walls and floor, will be finished with Vermont marble. The building will require 450,000 brick.

Brick manufacturers have been stirred up considerable over a petition being circulated, praying the Legislature to annex to Detroit all that territory east of the Lonyo road. All the manufacturers, with the exception of Andrew Lonyo and Haggerty Bros. are within that district. Should the Legislature annex this territory all the manufacturers who enjoy paying taxes on assessments made by township officers would, under city legislation, suffer greatly increased assessments, hence the uneasiness. A petition protesting against annexation is being freely circulated and contains some very influential names. Present indications point to a compromise line, which will leave out a majority of the brick manufacturers.

It is reported that the plant of the former R. H. Hall Brick Company, which has remained idle for several seasons, will again be in full operation next season, under the control and management of Mr. R. H. Hall. This plant is situated on the banks of the Detroit river, and is without doubt the largest brick making concern in the State of Michigan. Its bank of clay is deep and of the best grade, the engine, boilers, machines, etc., are all modern with up-to-date improvements The shipping facilities are excellent. Under the able management of Mr. Hall this mammoth concern should yield splendid returns. If Mr. Hall decides to operate the plant he has the best wishes of his brother-manufacturers.

We are pleased to note the deserved success of Mr. Dennis Burke. Beginning on a small scale, Mr. Burke some years ago associated himself with the late Thomas Clinby, and, with horse power, began the manufacture of brick. Later Mr. Burke retired from the firm and established himself at his present location, and from a horse-power brickyard his plant has gradually developed until it stands to-day one of the best equipped and best managed brickmaking plants in Detroit. Mr. Burke is an earnest, prompt and painstaking person and has gained a reputation for honesty and fairness. He is a son-in-law of the late Francis Hyns. Mr. Burke, your brother manufacturers extend to you their best wishes and trust that the New Year will have in store for you greater prosperity.

J. G. G.

A NEW FIRE CLAY COMPANY.

The International Clay Manufacturing Company, to operate with a capital of $500,000 under a New Jersey charter, was organized recently at the offices of the National Fire Proofing Company, in the Carnegie building, and the following directors were elected: J. J. Booth, of Pittsburg; W. A. Dinker, D. F. Henry, S. C. Grier, E. B. Alsop, C. C. Henderson, T. G. McCutcheon and W. D. Henry. The board of directors organized by electing D. F. Henry president, E. B. Alsop vice-president and W. D. Henry secretary and treasurer.

The new company is closely identified with the National Fire Proofing Company, capitalized at $2,000,000, the directors being nearly the same, although a number of the new company are not interested in the National. A large plant has been purchased by the new company at Perth Amboy, N. J., and in addition to the Pittsburg office, in the Carnegie building, offices will be maintained in the Townsend building, Broadway and Twenty fifth street, New York; Builders' Exchange, Boston, and the Stephen Girard building, Philadelphia.

The works at Perth Amboy will be engaged in the manufacture of terra cotta fire proofing and this, with five plants operated by the National Fire Proofing Company, will give the allied interests an annual capacity of about 300,000 tons. The National, which is a reorganization of the Pittsburg Terra Cotta Lumber Company, owns and operates two plants at East Palestine, O., which produce terra cotta conduits, and fire proofing plants at Port Murry, N. J.; Boston, Mass., and on Webster avenue, Pittsburg. The National, since its organization upward of a year ago, has been the largest factory in the fire proofing trade in the country, having only small and scattered competition. Formation of the new company makes the Pittsburg interest more essentially the leading fire proofing interest in the United States.

Product of the National Company is going into all the big new buildings of Pittsburg and many other cities. The fireproof lining of the new Union Station and the Pittsburg Bank of Savings building is being furnished by this company, which also supplied this material for the Empire building and the Schenley Hotel.

WELL, THE OLD YEAR is nearly at an end and in spite of the remarks of the pessimists, will go out much about the same way as did its predecessors—that is, at midnight on the 31st of December.

And then, like children, will welcome the new one, for the simple reason that it is new, young and fresh, as though we would educate it and make it amenable to our desires, instead of avowing the fact that the new year is more likely to make us toe the mark.

Over in West Philadelphia I jumped off the car to shake hands with the Carrolls. They're good men and true, Eugene, Michael and Peter, and in the loss of their father have had a blow inflicted that somewhat mars the beauty of the snow-covered country, the holly and the bright and happy anticipations which we poor mortals generally set up for this season of the year.

Michael, too, was thrown from his buggy about a month ago; this gave him a severe shock, and the loss of his carriage and harness. This, with a return of the grip, has robbed him entirely of the charming sense of geniality. For this I left a favorite prescription:

One short railroad journey to Baltimore.

Q. S.—Steamer to Old Point Comfort and four or five days in a nice atmosphere and good, congenial company.

The fifteenth annual N. B. M. A. Convention takes place on the 11th of February. I mention this for the obvious reason that some of our men have been so absorbed in the business of brick and money making that one or two pleaded ignorance as to the date.

—Murtha and Earley's—

Office was radiating with steam heat and general satisfaction.

Swinging around in his arm chair, Mr. Murtha exchanged greetings, and told me out and out that this has been a banner year. "We sold twenty million this year, and at an advance of $1.50 per thousand over the prices of last year. We kept the three machines steadily working and put on six hand gangs, and made good running throughout the year. We have no salmon left over, and we caught the market on hard, and this proved a soft snap. So, altogether, we feel satisfied, for there's not $100 worth of bad debts.

"Tell Mr. Randall I think I'll take in the convention; that train and boat ride sounds good and just suited to my complexion, while the local environment, so subtle and delicate in aspect, so charged with the glorious heat and light vibrations, that it will, I feel, do my companion and I much good."

Here I would beg the honor of introducing the companion and mascot.

Shank's pony and another trolley car landed me within hearing distance of

—Chambers Bros.' Company.—

From Mr. H. Chambers 'twas learned that the new indenter cutter, for rounding the ends of the bricks as they are cut, is almost completed, and the machine will be set up and trials made at Springfield, O., very shortly.

The Chattahoochee plant, lately burned out, may, with the assistance of the Chambers Bros., be able to set up the brick machines. These need overhauling and repairing, but new tempering machines will be needed and will be supplied by the above company. They will also set up a large machine, 60,000 capacity, for the Baltimore Brick Company, in the Monument street yard.

—The Main Belting Company—

Think very seriously of attending the convention. You may recollect that they attended the convention at Buffalo, with a result that was highly satisfactory. "New customers, some good orders and our representative had a good time and was well taken care of by the members of the association."

A strong gleam of pleasurable light stole into the face of the stalwart

—Thomas B. McAvoy—

as I put the question to him. Really, I can't say just at present, it sounds inviting, and I don't doubt but what the "boys" will have a good time. Anyway, if I don't go one of us will be there."

Frank's busy, and this season nearly sixteen million have passed through the gates, never to return, thank God; and between nine and eleven million has been the output at Frankford under the watchful eye of Alec.

—Murrell Dobbins—

Has many irons in the fire, but, thanks to his alertness and marvelous executive ability, manages always to keep them red hot, even if it does take nearly 9,000 ton of coal every year.

He has made an addition of two more muffled kilns to his smart pottery plant, over at Kaighn's avenue, Camden, N. J.

Down at Point Breeze they're working like Trojans, but as their fiscal year does not end until February, the year's output could not be obtained.

Joe Ridgway, the tireless representative of the C. W. Raymond & Co. plant, Dayton, O., keeps a car well heated between here and New York and the shores of the Atlantic, and times are reported as "fully good."

All extend season's greetings, and many look forward with pleasurable interest to taking a day off on Christmas day.

W. P. LOCKINGTON.

PROGRAMME OF THE ILLINOIS CLAYWORKERS' ASSOCIATION.

Springfield, Ill., Jan. 8-9, 1901.

—Tuesday, Jan. 8, 10:30 A. M.—

Enrollment of Members.
Reports of Members.

—Afternoon Session.—

Address of Welcome.
Annual Address, President E. J. Hess, Ottawa.
Paper, "Avenues Open for Clayworkers," H. F. Townsend, Avon.
Paper, "Manufacturing Drain Tile," A. S. Curry, Reddick.
Paper, "The Management," H. A. Eudaly, Springfield.
"Requirements of Brick for Paving Purposes," H. E. Beasley, City Engineer, Peoria, Ill.
Paper, "Sewer Pipe," W. R. Frost, Macomb.

THIRD SESSION.

—Wednesday Morning, Jan. 9.—

Reports of Committees.
Paper, "Round Kiln Difficulties," Charles A. Stookey, Belleville.
Paper, "Clay in Architecture," Charles T. Harris, Chicago.
Paper, "Paving Brick Tests and Inspection," A. L. Converse, Springfield.
Paper, "Tile Draining," B. G. Demey, Grant Park.
Paper, "Methodical System in Factories," C. O. Swift, Waverly.

—Wednesday Afternoon Session.—

Paper, "Difficulties of the Manufacturer," James Van Inwagen, Chicago.
Paper, "The Value of Geology to the Clayworker," E. R. Buckley, Madison, Wis.
"Experiences as a New Beginner," F. R. Hanson, Lexington, Ill.
Paper, "Social Relation Between Employer and Employe," W. D. Gates, Chicago.
Questions.
Report of Treasurer.
Report of Committee on Resolutions.
Election of Officers.
Headquarters will be at the St. Nicholas Hotel.

G. C. STOLL, Secretary, E. J. HESS, President.
Wheaton, Ill.

Written for The Clay-Worker.

CAPITAL BRICK AND BUILDING NEWS.

INCE THE SMOKE of political battle has cleared away and the combatants sheathed swords business has been resumed "at the old stands" all along the various lines of enterprise, and quietness and confidence "rule the hour." The brickmaking and selling business is moving along, not with a great rush, but steadily, and it is possible that the number of bricks sold this year will, at its end, foot up more than the 85,000,000 of the preceding year.

So far the building season has been one of much activity, and characterized by quite a number of big undertakings in this interest, and the coming season, in all probability, will see a boom in structural progress at the capital city. Congress will, it is thought, appropriate for a number of new buildings here, among them a municipal edifice, and perhaps allow more money for the new Bureau of Justice structure not yet begun, but, as before stated in The Clay-Worker, appropriated for to the extent of $1,000,000. A city hospital will also be one of the next season's building enterprises.

The principal government edifice now in process of erection is the printing office. Its present condition presents a forest of huge steel posts, beams, girders, etc., representing in part several stories, the first of which has its brickwork begun and well under way. The common brick used in this work will number about 6,000,000, enamel 1,200,000, vitrified 1,100,000, and the whole number, all kinds—from information recently obtained—about 13,000,000. The present printing office building contains nearly or quite 10,000,000 brick. A large percentage of the enamel brick for the new work came from Diggs & Co., of this city. This company will soon remove its manufacturing plant (for red brick) from its present location to Waterloo, Va., where clay is more abundant.

Congress may also this session appropriate for improvements in the White House, and thus perform a duty long neglected. Six thousand dollars were given by act last session to be employed in developing certain plans for the improvements, which, when made, will probably cost between $2,000,000 and $3,000,000. But the large sum required for this purpose should not prevent the carrying out of the work in every necessary detail for comfort, convenience and beauty. As an office building the White House, in its present shape, perhaps, affords room enough, but for office and residence for the President and family the old edifice is inadequate. And every President who has occupied the historic old mansion has found it too small for all needs, and especially so when guests remained for more than a day and bedrooms were required for them.

The new plans do not call for removal of any portion of the present executive mansion. Two new wings—one for each end of the building—will extend southward, forming with the older structure three sides of a hollow square, beyond the open end of which there will possibly be a conservatory of iron and glass, large and ornamental. The additions, if carried out as suggested, will also include columned wings facing Pennsylvania avenue, and porticos at the east and west ends. The plans give ample space for all requirements, and there will be no crowding in office or household affairs. Many new rooms are to be added, some of them quite large, and each is arranged as best suited to the family or business use to which it is put. Among these features will be a room for the President's advisors when they call for Cabinet meetings; others for the President's secretary, assistant secretaries, clerks, stenographers, telegraphers, etc. The newspaper men also will have a room in the building where they can get their "executive information" in shape, and the "other fellows" who wait "to find out things," namely, personal to themselves, will have plenty of space and a most comfortable spot in which to pass the time away. In fact, everything will be of the best, in kind and style, and in keeping with the high station of the President of the United States. Ours is a great country, and there should be nothing "small" about the home of its chief magistrate.

Among the private building enterprises now going on in Washington the new Willard's Hotel is the largest. This huge pile of brick and stone has the greater part of its walls up, and already forms a part of Pennsylvania avenue's adornment. The walls present a very pretty effect in limestone and light colored pressed brick, the latter being from the factory of the Hydraulic Press Brick Company, of this city. The cost was $25 per thousand, and the number to be used about 225,000. Although light colored brick are being used in this very costly and splendid structure, and some others, I was informed at the hydraulic company's office that brick in shades of red are again taking the lead.

The largest private residence completed here this season—and the largest in the city—is the $400,000 palace built for Mrs. Scott Townsend, mention of which was made in The Clay-Worker some months ago. This house is in greater part of red brick, laid with darker head courses, and the whole front is composed of Indiana limestone, ornamented with pilasters, wreaths, heads and also carved cornices. At each end of the mansion big porches of stone add to the general massive effect, further set off by a carved balustrade leading from the street and across the front. In the center of the latter is the street door, which is protected by wrought iron frame work and glass. The inside of this house is also (and more so) on the palatial order. Its arrangement embraces every modern convenience in plan and fixtures, and the decorations, including walls hung with silk, are lavish and rich, such as only millionaires can afford. All of the rooms are spacious, the dining room being such as would delight the lords of feudal castles, on account of its size, while the ballroom takes up the space of the entire west wing of the building.

Another very large new building recently made ready for occupation is Trinity College, situated in the District, and near the Soldiers' Home, at its southeast terminus. A pleasing feature of this immense pile is its red tile roof, making one of a few cases where such roof covering is employed here on large structures.

The rapid increase in the last few years of large buildings, for educational and other purposes, situated in the District of Columbia near the city, and the equally rapid growth of suburban villages here speaks well for the influence of the capital and its many advantages, particularly social and educational. In the latter particular Washington will some time lead the country, and at present there are few places, if any, possessing the sources of knowledge to be found here.

The student in many instances finds his material near at hand and without cost, the greatest source being the Congressional Library, with its nearly 800,000 volumes, 218,000 pamphlets, and its thousands of periodicals (The Clay-Worker being one of those seen in the new reading room), newspapers, manuscripts, maps, charts, music, etc., and convenience for study in this beautiful place is all that could be desired.

Besides this main avenue of knowledge the city has thirty libraries under government control, the number of books represented footing up about 800,000, making with those of the Congressional Libarary 1,600,000 volumes.

If the Washington student desires legal lore he can find such stored under the dome of the capitol, where are thousands of volumes written in this interest, a number of them printed in the early days of our national history. If medicine and surgery are his pursuits, the medical museum offers 100,000 volumes concerning man, his ailments, etc., for examination. Besides the books this museum contains many thousands of anatomical and pathological specimens for Mr. Sawbone's pleasurable inspection. The museum of hygiene also offers him in its over 2,000 models, apparatus, plans and diagrams, practical ideas in sanitary science, and this information is also available to builders of houses. The museum has exhibits of specimens of everything pertaining to modern hygienic features in housemaking, and among these are brick, tile, pipe and other things in clay.

The art student here finds his finest object lesson in the Corcoran Gallery of Art, a handsome marble and brick edifice, wherein are beauties in paint, in marble and bronze and in rare porcelains. Some of the latter came from Japan and China, but the most interesting specimens were the product of the French potter, and probably belonged to royalty before coming into the hands of their American owners, the Ogle Tayloes, of Virginia and Washington. After Mrs. Tayloe's death a great deal of historic and costly bric-a-brac and a number of paintings belonging to her became the property of the art gallery. Among this treasure were the poreclains mentioned. Vases, large dishes and plates make the principal part of the ceramic exhibit, every piece being of excellent quality, and a number beautifully decorated. Famous French beauties of the old regime, Marie Antoinette, Princess de Lambelle, Madame Elizabeth, Madame de Montesson and others are pictured on this ware, as is the face of Louis XVI as youth and as man.

There are other places in Washington where the student can get "free" education, among the best being the Smithsonian and National Museum, where, with thousands of other things, the potter's art is manifest in all its branches and beauty.

Before closing this letter I will say something about affairs of the District office. Contracts have been given for 1,500,000 vitrified paving blocks and 55,000 vitrified bricks for sewers. The paving blocks are light yellow in color, and in size are 9½ by 3¾ by 3 inches. The sewer bricks will cost $14.50 per

thousand. The expenses of the District of Columbia for the last fiscal year were $7,928,749.32. Of this amount $201,883.10 were spent for the improvements of streets, avenues and alleys; $7,052.03 for grading streets and alleys by chain gang; $197,381.42 for current repairs to streets, avenues and alleys; $217,310.12 for extension of streets and avenues, and $403,-798.10 for sewers. NICODEMUS.

A CAUSE OF VARIATION IN THE FIRING OF KILNS AND A REMEDY FOR THE SAME.

By Karl Langenbeck, Zanesville, O.

Reprint from Volume II Transactions American Ceramic Society.

CONTINUING THE DISCUSSION of the above subject, Mr. W. D. Gates said:

We have experimented in this matter of kiln foundation. In one case we arched over the foundation, making a brick arch from the outside to the center of the kiln. This arch carried the kiln floor and the center stack and left a space underneath; the kiln was really built on this arch. I was never satisfied that we gained enough to pay for the additional expense, however. Most of our kilns are built upon clay, with gravel underneath, but we took precaution to tile them thoroughly under the foundation. As they are on a side hill, this gives the water an opportunity to readily pass off, the tile catching it on the upper side of the kiln.

Still, I think we can readily notice the difference in burn-between a kiln that has stood for some time and one that has just been burned and is still dry and warm. Capillary attraction will carry moisture up into any kiln in time. I was thinking when Mr. Langenbeck's paper was read, of a kiln recently torn down which was one of the first we constructed and underneath which we did not tile. In putting in some foundations on the site of this kiln I found that the bottom flue was really only a little above the level of a pond of water near by, and that this flue had to carry away a large amount of moisture with every first burn. Of course, that is an expensive operation; it takes coal, and plays the mischief with the burner and the whole working force, sets them all to working on different theories, and we are lucky if we get off without bad ware.

I think perfect drainage is a very important point in the construction of a kiln.

Mr. Ross C. Purdy: When the Mosaic Tile Company built their last kiln, they used a double precaution against ground moisture. They not only encircled the kiln with a ring filled with broken tile, as described by Mr. Langenbeck, but they also insulated the kiln from the ground by laying a saucer-shaped cement concrete foundation. In this kiln, the behavior of the fire is more regular than in the others, but two peculiarities are to be noticed. The first is. that it is easier to get the bottom hard, and the second is that after the fires are shut off, the cones will often go down further without a seemingly corresponding increase in the hardness of the ware. That is if the fires are turned off with the finishing cone half over, invariably the cone will go down flat, while in the other kilns it will remain as it was at the shutting off of the heat.

Professor Orton: If a kiln foundation is damp, and has access to moisture during the firing, it will continue to deliver a certain quantity of moisture into the kiln gases. Ordinarily this moisture delivers directly into the gases which are flowing away from the ware to the chimney, and therefore it would be powerless to affect the ware; but where the foundation of the kiln is damp, it is not at all improbable also that an undue amount of water will be passing through the kiln during the entire process of burning.

Now, if that is the case, the ware is being subjected during its rising temperature to the action of highly superheated steam, the degree of superheating being greater, of course, as the progress of the burn goes on. The effect of superheated steam on clay wares has been tried to some extent. Professors Hertzfeld and Hauenschild, German chemists, who have made marked contributions to science regarding the production of lime for the beet-sugar industry, have shown that lime can be burnt with superheated steam, without any other medium; and, furthermore, that the temperature required for the complete dissociation of carbonate of lime is about 300 degrees lower with an atmosphere of steam than where the normal kiln atmosphere of air and carbonic acid is employed.

This experiment was not directed towards a ceramic application. It was directed only towards obtaining a high grade of lime for a particular purpose, but it may throw some light on our problem. Considered from all points of view except expense, the steam method was a great improvement over the old method. It produced lime at a lower temperature, gave better results on slacking, and the lime obtained from this process did the exact work required in the sugar business better than lime burned in the other way. Therefore, there was every inducement to carry on the process, but the inventors were compelled to give it up for financial reasons. Once in two weeks, they had to reline the entire apparatus and reconstruct the steam pipe-line for carrying the superheated steam. It was found that they were not only temperatures, but one which was acting on the fire brick, iron-pipe, in fact everything with which it came in contact. The fire brick crumbled down in as short a time as two weeks.

Of course, this is an extreme case. They had really a kiln atmosphere of steam, and we would hardly produce such conditions, under the circumstances which we are discussing. But if superheated steam in large quantities is able to do this, it may very well be credited with the power to affect the constitution of both body and glaze at the temperatures at which it meets them in the kiln. We may say that superware both give off water in small quantities, so that its vapor is invariably a constituent of kiln gases. But wet foundations may very sensibly increase the normal quantity without much outside indication of this fact.

Therefore, I can conceive that it has a disintegrating action on both body and glaze, tending to make the porous body weaker, and tending to affect the glaze by volatilizing the fluxing ingredients, thus driving out what should remain to promote fusion. Therefore, it seems to me not unreasonable to expect that the ware might come dull and clouded from the kiln if treated with superheated steam in excess of the usual amount.

Mr. Stanley G. Burt: The dulling of the glaze comes at a much lower heat, as, for instance, in overglaze muffle kilns. You will remember that last year I spoke of the use of steam for the convection of heat. I experimented to some little extent on that line, but never had any imperfection of body or glaze, no matter how much steam I put in the kiln. So the trouble must lie in some cause we have not yet unearthed.

Mr. Earl McK. Ogle: As to the effect of steam on the glaze, I agree with Mr. Burt; we used steam on our muffled kilns as I said last year, and as far as I was able to judge, the glaze was even better than it was in the ordinary kiln fired without steam. I agree with Mr. Burt, that I can see no reason why the glaze should be dulled by the introduction of water vapor passing through the fire-box, as it simply acts as a vehicle for the transmission of heat, carrying it from one point and depositing (the heat) in another, and I should think if it seeps up through the walls of the kiln, it would act the same, or about the same, as if introduced at the point of the jet in the fire-box, although it would probably act better if mixed with gas or fuel in the fire-box.

Mr. Edward C. Stover: Some of you gentlemen may be acquainted with Hawthorne's kiln. He is a Trenton man who has a patent on kiln mouths. He inserts a trough on each side of the kiln mouth, connected with a metal box where he pours water, it going into the mouth where it enters the bag of the kiln. He contends that when the fire gets to a high point, it will make just steam enough to perfect combustion and carry off the gases. I remember looking over a number of color trials which he had made, and he contends that he gets better results on color work with the patent device than without it. I am interested in knowing about this dulling effect, as we have a good deal of it, which we lay sometimes to the coal, to sulphur, to steam, etc., and I wondered if we could get some light on it.

Vice-President Binns (to Mr. Burt): What is your opinion, with regard to the chemical condition of the atmosphere, with regard to steam—does it become oxidizing or remain neutral?

Mr. Burt: The water vapor does not dissociate until it has passed a thousand degree C. Then you have oxygen, which would be an oxidizing agent and hydrogen which is a reducing agent; but as nascent hydrogen and oxygen at this temperature I think they are probably neutral, combining with each other again as soon as the temperature falls enough to permit.

Dr. William H. Zimmer: We have to distinguish between

physical and chemical difficulties resulting from the dampness of our kilns. In the first place, a damp kiln, necessitating the evaporation of an extra amount of water, requires a larger amount of fuel to get a certain degree of heat. That, of course, is a disadvantage to the manufacturer. Then in starting to fire a damp kiln we have to contend with the fact that steam will give a condensation of water, as the kiln is not hot enough to carry that certain amount of steam, and an excessive condensation of water may be detrimental to certain kinds of ware.

Outside of those physical conditions, the water-steam is strongly oxidizing. We have sulphur in our kiln gases all the time, and the presence of steam will help to convert that sulphur into sulphuric acid in oxidizing fire. In brick the body contains a certain amount of lime. If we give that lime a chance to be saturated by sulphuric acid, formed with the aid and help of the hot steam, then the carbonate of lime will be transformed into sulphate of lime. If this happens, we will have the danger that the iron in the brick or in any pottery ware will have no more chance to form a combination with lime—an iron lime silicate. Those iron-lime silicates show little color, while free oxide of iron will give a distinctly red coloring, and consequently saturation of the lime with sulphuric acid may cause in many instances what we call flashing.

Prof. H. A. Wheeler: I would like to ask Mr. Zimmer whether he thinks this action by the sulphur on the lime in the clay takes place at a high or low heat? For as soon as we start to burn with coal we produce sulphuric acid, as we have no coals but what contain some sulphur, some as high as 3 and 4 per cent. in the form of the bisulphide of iron—pyrites; and as at least half of this sulphur is set free and oxidized, we have to contend with sulphuric and sulphurous acids in the burning. There is no doubt that the sulphuric acid attacks the lime and forms a sulphate at low temperatures in the presence of moisture. But after the clays have attained a dull red, I doubt if the sulphuric acid has the slightest effect on the lime, and at higher temperatures, it is very doubtful. This question as to whether it is possible for the sulphuric acid to combine with lime at high heat is important, and I would like to hear from Dr. Zimmer further on this point.

Dr. Zimmer: I cannot give exactly the temperature at which the combination will take place; I suppose it will be the most active at a rather low heat; but I will state that sulphuric acid, or rather the sulphates formed by it, will exist and stay at a fairly high temperature. I experimented with one of the Le Chatelier pyrometer tubes, the glaze of which is a white lime-spar glaze. After it had been exposed to twelve or thirteen hundred degrees C., it showed that red color or flashing, and I was able to show very distinct traces of sulphuric acid in the glaze, after it had stood twelve to thirteen hundred C. Originally there was no sulphuric acid in that glaze.

Prof. Wheeler: Was the kiln perfectly dry?

Dr. Zimmer: The kiln was dry, but the pyrometer tube had been used from time to time, so it had accumulated sulphuric acid in a good many fires. I could distinctly show that sulphuric acid in the glaze.

The Chair: The subject has proved most interesting and I have just one word to say in closing. I think we are losing sight of the influence of water vapor during cooling. The effect of water vapor on glazed ware is to produce a dull surface. Whether this is due to the partial volatilization of the ingredients or to the action of sulphur I do not know; but I am convinced that it takes place during the cooling. We know that the development of ferrous oxide and blistering take place after firing off, during the time the kiln is cooling and before it has turned to a dull red. Water can be introduced under the kiln without the slightest harm during the firing; but if the kiln be allowed to cool in a moist atmosphere and the water vapors are drawn in right up to the time the kiln is cold, we can not escape damage. I am very glad to have had this paper and discussion. It cannot help but be profitable.

Mr. Walker: I have never noticed that it had any dulling effect on our ware; our experience has been more in the cost of extra fuel.

The Chair: The extra fuel used in evaporating the water?

Mr. Walker: Yes; I think there is a difference, though, between the water being introduced in the kiln in the shape of steam at the point of combustion, and being taken into the kiln all over the bottom and walls by capillary attraction. I think there is a very great difference. During the wet season, when there is much more moisture than usual around our kilns, we have found a small crystalline flaky spot appear on top of the glaze, sometimes, only on one piece of tile in a sagger, with none on the tile in the adjoining saggers.

I am not prepared to state that it is caused by the moisture in the kiln, as I have not been able to trace the cause of it, nor to be enlightened from other sources of information I have sought. I think, however, there is considerable in your statement as to the effect of moisture in the kilns during cooling and worthy of careful investigation.

The Chair: That crystalline diaper of which Mr. Walker speaks, in my opinion, is due to sulphur. Mr. Zimmer states that the presence of steam induces a strong oxidizing atmosphere, which oxidizes the sulphur to sulphuric acid, which, in turn, affects the glaze.

Mr. Walker: We do not experience that at all when firing with natural gas, or during the winter months.

Mr. Burt: I would like to ask Mr. Binns what condition he considers that sulphur to be in. Suppose sulphuric acid is formed and deposited on the glaze under favorable conditions. Do you imagine the actual decomposing of the glaze is possible? Sulphuric acid, to be crystalline, would have to be combined with some base. It often takes time to decompose a glaze by boiling in the acid. A mere deposition on the surface of a glaze would hardly account for decomposition enough to produce visible crystals.

Mr. Adolph F. Hottinger: From my experience it seems to me if we have, in cooling off, the pervading sulphur fumes, $S\ O_3$, and also steam going up through the kiln, we have everything favorable for an active solution of $H_2\ S\ O_4$, which would certainly tend to at least partially decompose the glaze.

Prof. Orton: I question whether the joint presence of $S\ O_3$ and steam at such a high temperature as visible redness or above, could be construed as equivalent to the action of sulphuric acid on the glaze. Why should $H_2\ O$ and $S\ O_3$ combine to form $H_2\ S\ O_4$ at such a temperature? We can take sulphuric acid and decompose it into $S\ O_3$ and $H_2\ O$ at temperatures far below this. Why then should they combine?

Mr. Hottinger: There does some action take place under such conditions. I cannot explain it exactly, but know from analysis that practically all of the sulphur in our glaze is present as $S\ O_3$, so there must have been some action taking place converting $S\ O_2$ to $S\ O_3$.

Professor Orton: I will agree that sulphuric acid burned at or about red heat is very likely to be burned to $S\ O_3$; but I don't see why we need to call in the action of water vapor to account for it. I think direct oxydation from the atmospheric oxygen is a more probable reaction.

Mr. Hottinger: It is not necessary to assume the action of water vapor, but it seems very probable, nevertheless.

Mr. Purdy: We have wandered away from the question as at first presented. The water from the ground, through seepage or capillary attraction of the brick wall, is brought into the kiln directly, but not through the flame; and it is claimed that as such the steam is injurious and causes the effect to which Mr. Langenbeck called attention.

DEATH OF A PROMINENT INDIANAPOLITAN.

Mason J. Osgood, president of the Sheridan Brick Works, died at his home, in Indianapolis, December 10, after a very brief illness. He was in his seventy-fourth year. He was born in New England and moved to Indiana thirty years ago, and has ever since been a prominent figure in business affairs, and leaves a very large estate.

A NEW CATALOGUE.

The American Blower Company, Detroit, Mich., are sending out a new catalogue, No. 116, devoted chiefly to engines and appliances connected with their power plants for heating, ventilating and drying purposes. Their A. B. C. engines are remarkable for their speed and effectiveness. We heard W. S. Purington, of the Purington Paving Brick Company, Galesburg, say recently that they had run one of these engines almost continuously during the past season at a very high rate of speed without a hot-box or other difficulty. A full line of similar engines are handsomely illustrated in this new catalogue, which they will be pleased to mail to any reader of The Clay-Worker.

HOTEL IDIOSYNCRASIES.

One of the strangest signs ever seen in a restaurant is in Riverhead, L. I. It simply reads: "Toothpicks Free to Patrons." This is on a par with the Asbury Park hotel-keeper who included in the bill of a departing guest, "For Use of the Ocean, $4."

A better story than either of these is told by John Maroney, of the Chicago Brick Machine Company, and he insists it is a true account of an actual experience at a Baltimore hotel. For full particulars see John.

WRITTEN FOR THE CLAY-WORKER.

THE NEW YORK BRICK MARKET.

THE TIME OF GOOD CHEER is at hand for the brick manufacturers, as well as every one else. This time last year there was a hope that the last year of the century would be one in which the brick trade would hum. All indications pointed that way. The opinion of men who had been in the business a long time was that prices would be better than for some years past. The brickmaker was in better condition financially than he had been for some time, for as a money-maker the year 1899 had been an improvement over the one preceding it.

With renewed hopes the preparation for the season of 1900 was begun. When shipments were made it was found the market was very sensitive, but this was thought to be due to the winding up of the work, and that when the new work was begun the market would be better. Some of the brickmakers closed contracts for prices that the majority of them would not have accepted at the beginning of the year. As the season advanced, the prices fell. Still there was a hope that there would be a revival of rate, but from week to week the demand grew less, and prices likewise, until they finally reached a figure that it is to be hoped will never be reached again in the sale of common brick.

What are we to do to help the market, was the question heard on all sides. The brickmakers never seemed to think that individually they could do a great deal. The usual remedy of curtailment was agreed upon, when a total cessation of manufacturing would have been a much wiser plan. If they had stopped manufacturing altogether, then what stock they had under the sheds could have been held there, and they would not have had to ship the brick in order to make room for more to be sold at a lower rate. It is said that less brick were made after the date agreed upon, but the price still kept going down. It was only after the yards had stopped for the season that prices took the slightest move upward. At this writing the close of navigation is liable to occur at any day and then, in all probability, prices will return to what they were in the early summer.

The demand at present is about what it has been for some time past. The dealer has in stock about all he expects to put in. He may possibly add a cargo from time to time, as he finds one that suits him both in quality and price.

—Strange Conditions—

Of trade seem to exist, as will be seen by the following letter, which was sent out to the brickmakers under date of November 8, 1900:

"At a well-attended meeting of brick manufacturers, held at the Palatine Hotel, this day, it was resolved to sustain the commission men in a proposed advance of twenty-five cents per thousand, to take effect Monday, the 12th inst.

"It was further resolved to recommend to all manufacturers to hold cargoes at the works until assured by their agents that these prices can be obtained by them.

"You are notified and requested to attend the next meeting of the brick manufacturers, at the Astor House, New York city, Friday, the 16th, at 12 o'clock noon. Your attendance at these meetings will make profit or loss for you."

This letter was signed by Wm. K. Hammond, Chairman, and John B. Rose, Secretary. What next! A meeting of brick manufacturers to notify their agents that after a certain date they must charge a certain price. No doubt the agent has done all he could, as the advance in price shows. Then the request to hold the boat at yard until the agent can get a certain price, and also setting a time when this advance is to take place. It looks as if the brickmaker does not wish to startle the dealer by too rapid an advance. All that could be done by notifying the agent to hold for price. It would be interesting to know how many that agreed to that contract will "stand by it." It is safe to say not all of them will.

—More Surprising Still Is the Second Letter.—

"At a well-attended meeting of manufacturers, held at the Astor House this day, it was resolved to advance prices of brick twenty-five cents per thousand in excess of present prices, to take effect Monday, November 26, at which time prices will be $5.00 to $5.50 per thousand.

"You are notified and requested to attend a meeting of manufacturers to be held at the Palatine Hotel, Newburg, N. J., Thursday, November 22, at 2 o'clock p. m. Subject of discussion, 'To Consider a Late Start in the Spring.'"

Signed by both the chairman and secretary. Can it be possible that the Hudson river brick manufacturers, after so many years of drifting along in their way of doing business, are going to take a hand in saying what they shall receive for their product. It certainly is high time, as many of them have found out.

There is no reason whatever why brick should rule at the low figures reached this year. The brickmakers blame the agent. If the price does not suit the manufacturer he says that the agent sold them for less than he (the manufacturer) knew they were bringing. If the agent had only held them, it would have been all right. Personally he does not say a word to the agent. It is to his fellow brickmakers that he says he was sold out. To judge by the above letters, the makers of common brick have taken a new departure in the selling line. Whatever the result may be, there is one claim that will be made by the manufacturer (that is, if they succeed in raising the price), "See what we did; we knew that the brick could be sold for more money—if the agent had tried." The manufacturer will hold back and the short market will help him. The agent might try his best to get the maker to keep his cargo at the yard, but he will not listen to him. Possibly this movement, although it cannot have long to run, on account of the lateness of the season, may furnish an example that will be decidedly beneficial to the manufacturer. He may learn that in order to make a successful steady business, he must see to it that those who handle his stock have his co-operation. He must not say that he will hold back and then the next day ship a barge.

—Master Minds—

Are to be found in all lines of trade. There are master minds enough in the common brick business along the Hudson river to make it a good paying business. The present movement is not a spontaneous one, but was organized by a few, and the others fell in line. There are always some that will not do anything to help along, but are always ready to take advantage of sacrifices others make for any improvement in the prices.

—Joining of Issues.—

The printing at the top of the letters referred to "Association of Brick Manufacturers and Agents," would seem to indicate that this is the beginning of a new business relation between the two branches. If such is the case it will benefit both the agents and the manufacturers. This is a good time to join issues.

The preparation for the coming season seemed to be a very decided improvement over any that has heretofore been made. If a late start in the spring is considered the best way to retard production, it is certainly time to come to some definite conclusion. They should not wait until time to mold and then call a meeting in New York city, when the manufacturer is busy and cannot, or will not, take the time to attend such a meeting. This proposition is certainly the best one that has been considered by the trade at any time. An agreement to curtail the profit would not be as beneficial as a late start.

The leading spirits seem to be looking ahead. A proposition for a late start would indicate that there is stock enough in the sheds to last until the new brick comes on. If the building trade does not make a decided spurt, a very large amount of stock will not be needed. From week to week this year there has been a decided falling off in the building permits. The present year will not show over half as many building permits as for the previous year.

—The Market—

Has reached a figure that has long been looked for. If one-half the quantity had been sent to market there would have been no suffering on the part of the building material men. The price would certainly have advanced more rapidly. The five-dollar rate did not make its appearance until the last of November. The result of these manufacturers' and agents' meetings will be watched closely to see what effect they will have in fixing the price for the men who have heretofore had their own way.

Haverstraws, $4.75 at $5.00 at 5.25 special.
Newburg Bay, $4.75 at $5.00 at $5.25 special.
Up-Rivers, $4.62½ at $4.87½.
Hackensack, $4.62½ at $5.00.
Pale, $1.50 at $2.00.

Hackensack, N. J., December 1, 1900. A. N. OLDTIMER.

Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

The Outlook in Maine.

Editor Clay-Worker:

Maine brick manufacturers have practically closed their works for this season. It was a good season, taken all around. The stock held for spring demand is larger than for years. There are in all the yards of Maine to-day perhaps 30,000,000 of bricks unsold. One-half that amount will, beyond the question of a doubt, be called for as soon as the frost is out, for small jobs. There are no great enterprises as yet in the air, but there can be no question that the election of McKinley has given business in Maine an encouraging brace. People look forward to the new year with confidence of good times coming. Even Democrats who believe in Bryan and his principles admit that present conditions will be benefited rather than injured by the success of the Republican party. And so, contracts for fuel and arrangements for a full operation next year in nearly every yard in Maine is now the order. The belief is that some great ventures will crop out between now and the first of April. B. J. DUNN.

Mr. Tiffany On Chimneys.

EDITOR CLAY-WORKER:

The Clay-Worker for October contains an article on "Chimneys and 'Riddle-Bottom Kilns,'" by George S. Tiffany, in which he says: "We agree with Mr. Stookey that 'the draft through a stack is estimated by the difference in weight of the column of heated air in the chimney and that of the column of the cool air outside of equal height and sectional area.'" That is good philosophy. Why should he lay down another rule which, while true in principle, is deceptive in its application, viz., "The amount that any flue, pipe or orifice will discharge in a given time depends both upon its sectional area and the velocity of the fluid passing through." I fail to see why Mr. Tiffany should say this rule is "deceptive in its application." In my article referred to I went on and stated that chimneys for burning several kilns at the same time must supply draft sufficient for all that may be attached at the same time. They must have capacity sufficient. They must be large enough. It is a matter of quantity as well as intensity. The velocity in the chimney increases with the temperature, but it is not advisable to build a chimney with large enough sectional area to serve the flues of only the kiln and then increase its height for each additional kiln that may be attached to be burned. This is why I said that his friend's chimney might have performed the same function if it had been lower with a greater sectional area.

Again, Mr. Tiffany says: "In the case of a chimney, 'the velocity of the fluid passing through' all depends upon its temperature, and if the stack is made larger than necessary—much larger than the main flue of the kiln—the expansion of the gases as they enter the stack and the greater radiating surface of the stack will reduce the temperature of the air in the stack and consequently the draft."

He surely does not mean that. The velocity depends upon the height of the chimney as well as the temperature within. There is more friction in a small chimney than in a larger one carrying the same amount of gases, since the velocity must be greater.

And in chimneys of the same temperature, and carrying the same amount of gases, the velocity would be greater in the one with the lesser sectional area.

The velocity of the gases in the chimney is of no concern so long as the proper draft is maintained in the furnaces and kilns. A chimney that is built properly to serve several kilns will satisfy each kiln whether one kiln is burned alone or in connection with several others. As the sectional area and height of any particular chimney are constant the temperature and velocity must vary with the number of kilns attached.

The velocity, as stated, varies with the temperature and height. But as the height is constant the velocity will be less with only one kiln attached than with two or more, since the gases in the chimney are heated and supplied by the furnaces of only one kiln. As more kilns are attached more gases and more heat are sent to the chimney—whose height and area are constant—and hence the temperature and velocity are increased.

Now, Mr. Tiffany's statement, quoted above, in reference to the expansion of the gases as they enter a large chimney, demands attention. Again, I want to say: He surely does not mean that. Gases expand only under two conditions, viz., by increased temperature with constant or reduced pressure or by reduced pressure.

Gases passing from the kiln to the chimney receive no additional heat, and hence do not expand by the addition of heat. They pass into and through the chimney by the pressure of the cooler, external air through the furnaces and kiln, and are impelled forward by this pressure. It is the density of the gases and hence the weight that is reduced by the heat within. The gases are pushed through the kiln and chimney and not drawn by suction, as by a pump or fan at the top of the chimney.

If there was a suction in the chimney the gases would expand, but since they are impelled forward by a pressure behind them they cannot expand upon entering the chimney. If the chimney is serving only one kiln and the area of the chimney is greater than that of the flue leading from kiln to chimney, the velocity of the gases would be lessened as they entered the chimney, but I cannot understand that there would be any expansion.

Further on Mr. Tiffany ironically says: "Having read Stookey and Waplington on chimneys, we would really like to know what Ben. Franklin wrote upon the subject." If he will read this article he will learn that he has not yet read all Stookey might be able to say. His method of writing suggests that he is not familiar with what Ben. Franklin wrote about "A Scolding Wife." Irony may be effective sometimes in a country debating society, or in pleading before the average jury, but in scientific discussions it is of no value.

As I understand the natural laws that govern the phenomena of chimneys and draft my statements will all stand the scrutiny of scientific criticism. My childhood training taught me that it was not good form to speak unkindly of the departed. If Mr. Waplington made a mistake in his writings it should have been corrected with charity. If I make mistakes they might be corrected and answered with vigorous and kindly stated scientific references. When I misstate a natural law or make a statement at variance with the accepted teachings of our leading physicists, I invite correction and will thank the critic, if his review is written in the proper spirit. But reviewers should be very sure that their criticisms are unquestionably exact. D. W. STOOKEY.

Wants a Partner o Help Manage a Growing Trade.

Editor Clay-Worker:

I have now for some time closed operations in my dry press plant and am getting things ready to resume operations again in the early spring. I had no end of trouble to get things to work, it being the first year, and the chief difficulty by far being the extremely wet season, but lately I have had satisfactory results.

I have unlimited quantities of different kinds of clay to make brick, tile, terra cotta, sewer pipe and fire brick. All my clay burns red but the fire clay. Above the fire clay I have a seam of 4½ feet of good soft coal, about 100 feet below that is another 6-foot seam of good coal.

There is a good demand for brick and I want to put in a stiff mud machine next season, and make other improvements. Common brick sell here for $7.00 and $8.00 per thousand, delivered in town, about a one-mile haul or on board cars.

I want to sell half interest in my plant in order to get more capital into it to develop it more rapidly and to keep up with

the increasing demand, and I shall be pleased to correspond with any interested party. PETER ANDERSON,
Edmonton, N. W. T., Canada.

A Canadian Brick Plant.

Editor Clay-Worker:

The Clay-Worker is a very welcome visitor always—every month. We have noticed with more than ordinary interest the articles in recent issues describing the brick office buildings of some of the representative firms in the States, so we make bold to send you some photos of our plant, not because they average up with those you have illustrated, but because they are ours. While our office is not the best and is not even built of brick, but is only a neat frame structure, it is the newest brickyard office we know of, having but recently been finished.

The LaPrairie Brick Co.'s Office, Works and Officers.

Photo No. 1 gives a view of the front of the office, with the flagstaff attending to business on the outside, while the rest of the "staff" are inside, making up the pay roll. The next view shows our home-made plow (not patented) tearing up shale, while the one below gives a glimpse of sections of our works, and at the bottom may be seen the managing director, James W. Tester, in a characteristic pose, and on his right the superintendent of the works and on the left the shipper. We have all been kept very busy the last season and each thinks he is entitled to a vacation about convention week. One of us will be at Old Point, sure, and perhaps others from this vicinity.

Enclosed find check covering amount of our subscription.

THE LAPRAIRIE BRICK CO.

Montreal, Ont., November 27, 1900.

The Chicago Brick and Building Situation.

Editor Clay-Worker:

This date, one year ago, I endeavored to give your readers an idea of the "Chicago situation," and to the average reader my ideas would appear pessimistic. In recalling Chicago's experence for the past year, my gloomy recital of the evils of trades-unionism does not give an iota of the true inwardness nor of the incalculable loss to Chicago through the manipulations of the labor agitators.

September and October saw a decided improvement in all lines, but November takes its place with the summer months, as the trades unions, through their agents, have decreed that any effort on the part of capital to find a lodging place in buildings of any description will be opposed from the start, especially work in the down-town district.

November has numberless assaults and one murder to its credit, and no convictions other than an occasional $5 fine imposed upon a union member, not for being one of a mob, assaulting a non-union man, but for getting caught. Riots in State street, crowded with women shoppers, were frequent, and public sentiment at last forced our Mayor to a realization of his duty, and after three weeks of lawlessness the agitators are in a measure controlled.

The Hibbard Spencer Bartlett Company announce in an open letter to the unions that it is their intention to erect, no later than next spring, a large store and warehouse building, and that if the conditions among the mechanics and laboring men are not improved in the next few months, either by their own actions or the power of the city government, "so tardily employed to protect its citizens," the building will be erected without the employment of a union man, or will not be erected at all. They close with this statement: "If the workmen who do not endorse lawlessness and are chafing under the bondage imposed upon them by a few spellbinders, who are filling their own pockets and emptying those of the men they profess to represent, should assert themselves, the 'labor troubles' would speedily end without the interference or assistance of any city government."

This letter aroused a storm of protest from the union leaders, and the firm was promptly denounced as in league with the contractors for the unholy purpose of undoing all that is dear to the man who has nothing for sale but his labor. A decided feather in the cap of the unions was the dissolution of the National Industrial Trades Union and the subsequent joining of the "regular" unions by the ex-members of the defunct organization. The National Industrial Union was fostered and protected by the contractors' association, who in fact stood sponsor for it.

Increase of work during September and October required

more men, and the management of the "independent" union felt that the contractors were giving them the short end of the string, and a revolt and bolt to the enemy was the result. The contractors claim that the cause of union labor does not gain by its new membership, as "the majority of them (industrials) could not be used by us to advantage on account of their inability to perform properly the work of a building mechanic," as a prominent contractor put it. A statement which, if analyzed, would be inconsistent, to say the least. To my mind, the Chicago contractor furnished the inspiration for the lines, "When the devil was sick, the devil a monk would be. When the devil is well, the devil a monk is he."

While the city proper shows little activity in building, our suburbs are coming to the front, and Chicago Heights takes the palm for push and hustle. She will soon have a mammoth freight clearing house, no less than two structures, each 700 feet wide and 5,200 feet in length, of common brick, and will comprise nearly 700 acres of floor space under one roof. This will form the greatest distributing and clearing point for freight in the world. Montgomery, Ward & Company will also erect a factory 60 by 400 feet, four stories high, with power house attached.

It is a physiological mystery as to why recreation is essential to a business man who has passed the "frisky" age, and it is a fact that a number of our contractors, architects and material dealers have their full quota of this mystery, besides being Scotchmen, and that is why I grasped the opportunity and the ticket—paid for by the company—which made me a guest of the fifty-fifth annual banquet of the Illinois St. Andrew's Society, at the Auditorium, November 30. Wishing to show my good will, I practiced for a few days on "Hoot, mon!" and Scotch whisky, and tried to fix on something that resembles haggis, but when I struck the real thing I had to admit that my home production of sawdust, onions, pepper and tobasco sauce was a decoction for babes compared with the Scotch product. The feed was a success, and St. Andrew may well be proud of his Chicago champions.

—The Purington-Gates Feud.—

In your October number you publish, in good faith, a creditable article on the Purington Paving Brick Company's new office at Galesburg, with a few photos thrown in. In the same issue appears this innocent paragraph: "If any of our readers or contributors know of any brick office that they think is as good or better, we will be pleased to have them send photos for illustrative purposes." This, of course, met the eye of Mr. Gates, of the American Terra Cotta and Ceramic Company, who used a large number of the Galesburg paving brick in the construction of his office and laboratory at Terra Cotta, Ill., and when he struck the "stone trimmings" there was trouble. Your November issue contains a photo of his office, and in a well-worded article veiled sarcasms and hidden innuendoes are handled with a master hand. Mutual friends endeavored to heal the breach and prevent the scandal of an open rupture between two lifelong friends, but to no purpose.

Stone trimmings instead of Gates terra cotta was the last straw, and I am informed that should you secure a photo of Mr. Gates' office at the present time, and the photographer's art equal to the reproduction of color, the once imposing structure of paving brick would show a dark green, as the entire building has been treated to three coats of paint and everything possible done to efface all semblance of Galesburg product. That Mr. Gates is terribly in earnest, a glance in the vault opening from his office in the Chamber of Commerce Building, will convince the most skeptical. Some eight or ten muskets, vintage of 1860, are in position for instant action, and they are none the less sanguinary from the fact that they were secured at a 98-cent sale at one of our department stores.

The feeling innocently engendered between Messrs. Purington and Gates is to be deplored, and a glance at the residence of Mr. Purington will prove that he endeavors to be at peace with his fellow craftsmen, and his error at Galesburg is more of the pocket than the heart. The residence in question is at 4800 Kenwood avenue, and as I deal with the exterior only, suffice it to say that the interior is all that good taste and elegance could suggest. For the exterior: The stone dealer comes in for foundation and first story, which is of block rubble; second story, blue slate; gables and roof, black slate; press brick chimneys, wood porch, and, of course, common brick backing, and the iron fence enclosing the spacious lawn is not to be overlooked, unless the "looker" is some eight feet high, and the most striking feature of this fence is the artistic posts, products of Mr. Gates' factory.; I am informed that Mr. Purington has been with difficulty restrained from decorating these posts with an axe since he read Mr. Gates' letter. Friends of both parties realize it has gone far enough, and I violate no confidence when I state that a quart bottle of entente cordiale has been sent to each with directions as to using, and it is to be hoped that when the glad Christmas chimes ring out their greetings of "Peace in heaven, on earth, good will towards men," trade animosities will be forgotten, the "dead past bury its dead," and the next time Mr. Purington or Mr. Gates intends to build, due regard to each other's products will be given. VERITAS.

Chicago, Dec. 12, 1900.

Notes From Tide Water, Va.

Editor Clay-Worker:

The Suffolk Clay Company have placed an order for another four-tunnel Sharer dryer. They have a very hard clay to dry and find they must dry from thirty-six to forty-eight hours. After carefully examining other dryers they believe that no other dryer would do better work in their clay than the one they have, though it fell far short of the guaranteed capacity, so they have duplicated it and expect to turn out thirty thousand brick per day from their eight-tunnel dryer. The new dryer is to be completed in thirty days.

Mr. John Salgue, who has been superintendent for the firm of Murdaugh & Mays, at Sturgeon Point, Va., for several years, has resigned his position with that firm and has been engaged by the Nansemond River Brick & Tile Company as superintendant. General Manager A. V. Sturgeon says he will build a new steam dryer and change their kilns from wood to coal-burning kilns.

The machinist at the works of the Nansemond Clay Company had the misfortune to lose one of his fingers by getting it caught in the cog-wheels on the brick machine. The finger was taken off at the first joint. It happened that the machine was being turned by hand at the time to do some work on a sprung shaft, otherwise he might have lost his hand.

There is a rumor afloat that Suffolk, Va., will have a new brick plant of twenty-five thousand daily capacity by spring. The location has already been selected, on the river northwest of Suffolk. The parties interested are Washington, D. C., capitalists. H. L. J.

Suffolk, Va., Nov. 28.

CONVENTION DATES.

The Illinois Clayworkers' Association will hold its next annual convention at Springfield, Tuesday and Wednesday, January 8 and 9. See programme on another page. President, E. J. Hess, Ottawa, Ill.; secretary, G. C. Stoll, Wheaton, Ill.

The Iowa Brick and Tile Association will hold its twenty-first annual State convention at Boone, Iowa, Tuesday, and Wednesday, February 5 and 6. President, J. B. McHose, Boone, Iowa; secretary, Robert Goodwin, Jr., Redfield, Iowa. Boone is a town of 8,000 people and has fine hotel accommodations.

The American Ceramic Society will hold its annual convention at Old Point Comfort, Va., February 11 and 12. President, Karl Langenbeck; secretary, Prof. Edward Orton, Jr.

The National Brickmakers' Convention will hold its fifteenth annual convention at Old Point Comfort, Va., Wednesday to Saturday, February 13 to 16. President, W. D. Gates, Chicago, Ill.; secretary, Theo. A. Randall, Indianapolis, Ind.

The Ohio Tile, Brick and Drainage Association will meet at Columbus, O., Tuesday and Wednesday, February 12 and 13, if a convention is held this winter. The latter had not been determined definitely at the time of our going to press. President, J. W. Everal, Westerville, O.; secretary, Ed Darnell, Grove City, O.

The Northwestern Brick Manufacturers Association will hold its annual meeting at Litchfield, Minn. Date not yet determined. President, Henry Ames, Litchfield; secretary, Lewis Moline, Willmar, Minn.

A New Factory.

These are busy times with the Standard Dry Kiln Company, Indianapolis. Their business has grown steadily each year since they located in the Hoosier capital, in 1894. The past year has been the best in their history; they have outgrown their present quarters and are building a new factory—a handsome three-story brick structure, located at 629 to 633 S. Pennsylvania street, which they hope to occupy early in January, and where they will be pleased to welcome visiting brickmakers.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SEVENTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXXIV. DECEMBER, 1900. No. 6.

CURRENT COMMENT.

Speed the parting and welcome the coming year. Nineteen hundred has been richly generous in its fruitage, and its memory will ever be most pleasureable.

* * *

The Clay-Worker has prospered, as have the great majority of our readers, both at home and abroad. Their number has increased in a goodly proportion that insures a widening field of usefulness. We stand on the threshhold of the new year with an abiding confidence that it will prove equally prosperous.

* * *

All building interests throughout our own country are in a most healthy and promising condition. Never before in the world's history were clay products in such universal demand. It seems almost certain that more structural clay ware will be consumed in the next twelve months than in any previous year. Welcome 1901.

* * *

Our good friend, M. E. Gregory, of Corning, N. Y., shows an exceptionally charitable disposition by touching so lightly on "Brother" Gates's iron roof. It is the only vulnerable spot in his otherwise invincible clay armor. Mr. Gregory, however, can well afford to be generous, for he is a prize winner, his office building being the nearest to a strictly clay structure of any we have yet illustrated. If there are others we will be pleased to receive photos and particulars.

* * *

The illustrations on pages 436 and 437 demonstrate the difference in wearing qualities between building brick and paving brick for roadway purposes. Though the latter be hard-burned, they are not suitable for paving busy thoroughfares. Nevertheless, the fact that a pavement of hard-burned building brick has withstood the wear of traffic on a busy street of a town of 10,000 people for seventeen years and the pavement still in a fairly good condition, would indicate that a poor brick street is far better for the taxpayer than a good wooden or asphalt pavement. It is a poor "thinker" that cannot grasp the suggestion that a good brick pavement is the best and most durable roadway that can be built.

* * *

We wish all our readers, each and every one, a merry Christmas and a happy and prosperous New Year, but naturally, those who are promptly renewing their subscriptions come in for special remembrance and good wishes.

* * *

The first of the winter's conventions is that of the Illinois Association, which will be held at Springfield, Ill., January 8 and 9. The programme, given in full in another column, provides for a feast of trade discourse. Every Illinois clayworker ought to be there. Those from neighboring States who can attend will be welcome. A good time is in store for all, for, be it remembered, Springfield is the home of Dr. Converse, and where the Doctor is, is a good time.

MEETING OF THE PAVING BRICK COMMITTEE.

The committee appointed at the last annual convention of the National Brick Manufacturers' Association to prepare specifications for the most approved methods of constructing brick pavements, composed of D. V. Purington, Chicago, chairman; W. P. Blair, of Terre Haute, Ind., and T. B. Townsend, of Zanesville, Ohio, met at Indianapolis, December 13, and deliberated industriously throughout the day and into the wee, sma' hours with very satisfactory results. A written report of their conclusions will be submitted to the next convention. It is hoped that a similar committee appointed by the American Society of Municipal Improvements will consider the same matter and that the two committees will make concurrent reports, and that as a result a standard form of specifications may be adopted that will result in better methods of construction throughout the country. This is the one thing that is necessary to make brick pavements superior to all competing materials.

HOLIDAY GREETINGS.

The Clay-Worker enters the homes of its numerous readers with most cordial holiday greetings. First, we say to every one, "Merry Christmas!" And why not be merry? There is too little mirth and merriment in the rush of the business life of this generation, hence it is well that one day in the year should be recognized by everybody as a day of merriment. We may be merry in our homes by making every member of the family recognize in every other member a companion and friend.

The Clay-Worker would not be an iconoclast on such a day as this. Every one remembers the sadness that came over him when he first realized that that universal friend of childhood, Santa Claus, was only a myth. He had so often contributed to the real delights of Christmas day that it was hard to part with him. Let us rather insist that after all there is a veritable, real, living, ubiquitous Santa Claus. He may not be visible to the naked eye, but he is tangible, if not to the fingers, to the feelings of universal childhood. He is the embodiment of love and good-will. He may not come in the form of a sleigh drawn by reindeers, but he comes to wish every child in the land a merry Christmas, and, after all, is he not the real force, invisible, it may be, but none the less real, which fills the stockings of the child and contributes so much to the enjoyment of this universal Christmas holiday?

Some of the families we visit this year have had occasions for sorrow during the past twelve months, but that is no rea-

son why on this jovial day they may not join in the merriments and sport of the Christmas celebrations.

Next comes the New Year's day. By common consent the salutation from each of the other is varied. Last week we wished a merry Christmas; this week we wish a happy New Year! That means much, but it means, after all, that happiness must come from within more than from without.

It is easy to recognize that physical suffering, and personal bereavements, with loss of health or property, may militate against our happiness for a time, but it is the province of every one to so receive the sad experiences of life that there may be a beautiful silver lining to every cloud.

A happy New Year! We must not be considered sordid if in our thought we contemplate a year of business prosperity. Not for many years has the outlook been so promising to those who are willing to pay the price of prosperity, patient, faithful work. This is not the hour nor place for a homily on industry. The very fact that The Clay-Worker enters your home once a month is prima facie evidence that you are industrious and economical, seeking valuable information and willing to apply the knowledge you receive from books and periodicals.

The business outlook, the country over, indicates such a season of prosperity to every industry, that it seems evident that nothing but such calamities as pestilence or famine, or destructive tornadoes, which may befall us, can prevent it. Though the world is not now, nor ever will be, wholly exempt from such calamities, yet we hardly anticipate them, so free have we been in past years from anything of that kind.

A happy New Year! After all the great secret of happiness with every individual is a fixed purpose and the continual practice of making others happy. The Clay-Worker now promises to do its part in making all its readers happy. Let every one reciprocate, as far as possible, for we are not alone. We stand or fall with our readers.

THE NATIONAL CONVENTION.

It is none too soon to begin to plan for the coming annual convention to be held at Old Point Comfort, February 11 to 16, the details of which, so far as arranged for to date, are given elsewhere in this issue. The brickmaker who says he is "too busy," "can't spare the time," etc., simply deceives himself, or worse, tacitly admits that his business is not well ordered, else it could be left for a week or two. In early times in Indiana there was a Friend (Quaker) who never failed to hitch his farm wagon and go with his family to "mid-week meeting." One of his worldly neighbors asked him one day how he managed to find time for this. "Oh," he said, "I plan for it, and I have as much time for that as anything else in my plans." So, reader, if you have not already planned to go to the National convention, begin to plan at once.

The old standbys, those who have attended most of the former conventions—a few have attended all—need no urging. They have so learned to love conventions for what there is in them for every one who participates in the right spirit, that nothing short of a calamity could keep them away from these yearly meetings, which to them take on the character of reunions, where, in the lobby talks, they fight over and over their brickyard battles. To those who have never attended a brickmakers' convention, the frankness with which the members swap trade experiences is astonishing. If there is a brickmaker in the land who is striving to solve some problem in the manufacture or sale of his brick, and who is there who is not, let him come to the convention, and before he has been there twenty-four hours, unless he is blind, deaf and dumb, he will be in a fair way to acquire the exact information needed.

Of course, those brickmakers who know it all and have nothing to learn do not need to come to a convention for information, but even they might find the social features very pleasant, and, as a mere matter of recreation, a decided benefit. These wiseacres gain their wisdom by close and unceasing attention to business. If they will relax a little one week in the year they will not only make life the more endurable, but may, perhaps, lengthen their days of usefulness. Those who know they don't know some things they ought to know, cannot possibly afford to miss a convention. So, we say to clayworkers, whether you are running a large plant or a small one, make your plans to go to the National convention.

THE POSSIBILITY OF A TIMBER FAMINE.

In the October number of the Forum, Chief Geographer Gannett, of the United States Geological Survey, writes in answer to the question, "Is a Timber Famine Imminent?" and his answer is most decidedly in the affirmative of the question. And therein is food for reflection to the clayworkers of the country, and not only to the clayworkers but to all citizens who feel any sort of interest in the welfare of posterity and the nation's future good. It is plain from Mr. Gannett's statements that the time is now at hand when all efforts to conserve the timber supply of the country should be exercised. He says: "The average stand of timber upon the wooded lands of the East does not exceed 1,500 feet per acre in a total area of 500,000,000 acres of woodland in this part of the country." The total stand of timber throughout the country he estimates at 1,380,000,000,000 feet. In 1890 the cut was about 25,000,000,000 feet, since when the annual cut has somewhat increased. According to Mr. Gannett's estimates, there is barely timber supply in the country for fifty years, according to the present rate of consumption. This being established and the fact that the rate of consumption is on the increase annually to an enormous degree, the danger comes home to us with a thrilling sense of its proximity. Optimists there are who will arise and attempt to set aside Mr. Gannett's findings by quotng old-time forestry figures to show that natural growth will of itself set Mr. Gannett's figures at defiance, but these optimists must be taken to task before accepting their utterances on the subjest. It is a fact that cannot be controverted that in the past fifty years the demand for timber alone has succeeded in bringing our apparently limitless supply of timber down to within bounds where a possible timber famine presents itself. If the simple uses of lumber in building and manufacturing could do this while the population of the country was two-thirds its present size, what argument can prevail upon us that a timber famine is not probable within the near future, when the wonderful growth of our country has but begun, and the demand for lumber being thereby quadrupled in fifty years is now augmented by the addition of pulp mills, that have sprung up since 1890 and which are eating the forests literally root and branch, day and night, winter and summer, wherever they have been located. In my estimation, unless other material enters more widely into building construction as a substitute for wood, the timber famine of Mr. Gannett will make itself felt within this generation. I can only reiterate what I have before reiterated, the time is here when the clayworkers should begin a campaign of education, to push forward the claims of clay as material for building. At best our forests are doomed to extinction, but our clay is absolutely limitless and inexhaustible, as it is also indestructible and unchangeable when put to the uses for which it is designed. I can see, with the decadence of the timber, a future for the clay industries such as recorded history knows not a parallel.

B. J. O.

WANTED—MARCH (1900) CLAY-WORKER.

For some reason there has been an unusuallly large demand for the March, 1900, issue of The Clay-Worker, which has entirely exhausted our reserve supply of that issue. We will, therefore, thank any of our readers who do not keep The Clay-Worker for filing, if they will send us that particular number, and will credit them with 30 cents on subscription account. When mailing, write name and postoffice address on wrapper or paper or both, so proper credit may be given.

THE LITTLE FELLER'S STOCKING.

By Joe Lincoln.

Oh, it's Christmas Eve, and moonlight, and the Christmas air is chill,
And the frosty Christmas holly shines and sparkles on the hill,
And the Christmas sleigh-bells jingle, and the Christmas laughter rings,
As the last stray shoppers hurry, takin' home the Christmas things;
And up yonder in the attic there's a little trundle bed
Where there's Christmas dreams a-dancin' through a sleepy, curly head,
And it's "Merry Christmas," Mary, once ag'in fer me and you,
With the little feller's stockin' hangin' up beside the flue.

'Tisn't silk, that little stockin', and it isn't much fer show,
And the darns are pretty plenty 'round about the heel and toe,
And it's color's kinder faded, and it's sorter worn and old,
But it really is surprisin' what a lot of love 'twill hold;
And the little hand that hung it by the chimbly there along
Has a grip upon our heartstrings that is mighty firm and strong;
So old Santy don't forgit it, though it isn't fine and new,
That plain little worsted stockin' hangin' up beside the flue.

And the crops may fail, and leave us with our plans all gone ter smash,
And the mortgage may hang heavy, and the bills use up the cash,
But whenever comes the season, jest so long's we've got a dime,
There'll be somethin' in that stockin'—won't there, Mary?—every time.
And if, in amongst our sunshine, there's a shower er two or rain,
Why, we'll face it bravely smilin', and we'll try not ter complain
Long as Christmas comes and finds us here together, me and you,
With the little feller's stockin' hangin' up beside the flue.

—Saturday Evening Post.

YOU'LL NEVER MISS THE PROFITS TILL THE GRINDER STOPS.

When a boy my father called me where he toiled, a-setting brick,
And he said, "My son, you'll soon be old enough to do the trick;
You will find that tricks in every trade most certainly abound,
But the safest trade to work is where the honest tricks are found.
'Waste not, want not,' you've heard the doctors preach,
'Tis the one great trick in brick making, and all that I will teach;
Never stop your strikers, tho' it were to harvest crops,
For you'll never miss your profit 'till the grinder stops.

"Never starve your brickmakers, nor work them over time,
Never stain your manhood to defraud them of a dime,
Never try for riches by the trick of cheating count,
And never cut your honest price, no matter what amount;
Never leave your business for attractions of the town,
And never think 'twill build you if you run your neighbor down;
Keep your strikers working and leave silly tricks to fops,
For you'll never miss your profit 'till the grinder stops.

"Be a man at all times and never play the sneak,
Keep your crew a-hustling, but never crowd the weak;
Let the times be hopeless, just do the best you can,
And if bad luck assails you up and face it like a man.
Luck is always with the brave, fortune with the strong,
Take the world's worst tale of woe and turn it into song;
Never mind the darken'd sky, keep working 'till she drops—
For you'll never miss your profit 'till the grinder stops."

—BRIAN J. DUNN.

Books for... Brickmakers.

"CLAY GLAZES AND ENAMELS," H. R. Griffen	$5.00
"BRICKMAKERS' MANUAL," Morrison and Reep	3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr.	2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley	1.00
"VITRIFIED PAVING BRICK" H A. Wheeler, E. M.	1.00
"PRACTICAL FARM DRAINAGE,," J. J. W. Billingsley	1.00

Mailed, postage free, on receipt of price.

Two for the Price of One.

SPECIAL CLUBBING RATE TO NEW SUBSCRIBERS,

The CLAY-WORKER ....AND.... DRAINAGE JOURNAL { ONE YEAR FOR } $2.00

Offer Good for Thirty Days Only.

T. A. RANDALL & CO.,
Indianapolis, Ind.

TABLE OF CONTENTS.

Clay From Top to Bottom..... 431
That Clay Bank..... 432
Notable Clay Products and Exhibits at the Paris Exposition 433
Fire Brick; Their Manufacture and Uses 434
Fired Kiln With Silver Torch. 436
Brick Paving in Champaign, Ill..... 437
A Clayworker's Observations in Havana..... 439
Button-Hole Talks..... 440
A Baltimore Brick..... 441
Secret Information..... 442
Obituary 443
Prehistoric Clayworkers..... 444
Consumption of Fuel in Burning Brick..... 445
A New Continuous Kiln..... 447
Prospecting..... 448
U. S. Potter's Association..... 450
Official Announcement 451
By the Light of the Kiln Fire.. 452
A New Fire Clay Company 453
In Philadelphia Brick Yards.. 454
Programme of the Illinois Clayworkers' Association..... 454
A Cause of Variation in the Firing of Kilns and a Remedy for the Same 456
Death of a Prominent Indianapolitan..... 457
A New Catalogue..... 457
Hotel Idiosyncrasies 457
Convention Dates..... 461
A New Factory..... 461

CORRESPONDENCE.

Grinding Machine Wanted 447
Detroit Brick News..... 453
Capital Brick and Building News 455
The New York Brick Market.. 458
The Outlook in Maine..... 459
Mr. Tiffany on Chimneys..... 459
Wants a Partner to Help Manage a Growing Trade..... 459
A Canadian Brick Plant 460
The Chicago Brick and Building Situation 460
Notes From Tide Water. Va. .. 461
Pacific Coast News..... 470
In and About Pittsburg..... 474

EDITORIAL:

Current Comment..... 466
Meeting of the Paving Brick Committee..... 466
Holiday Greetings..... 466
The National Convention..... 467
The Possibility of a Timber Famine 467
Wanted — March (1900) Clay-Worker 467
Editorial Notes and Clippings. 476

MISCELLANY:

Success Slow But Sure..... 433
Improving the Opportunity.. 450
You'll Never Miss the Profits Till The Grinder Stops..... 468
The Little Feller's Stocking... 468
One Advantage of Folding-Beds 470
A Catastrophe..... 474

Index to Advertisements on Front Inside Cover Page.

WANTED—Position as superintendent of a dry-press brick plant by a thoroughly practical brick maker and burner. No. 1 references. Address H. W. H.
12-1-c-m. care Clay-Worker.

WANTED—Position as head burner for paving, front or fire brick, or sewer pipe, terra cotta, etc.; best of references; young and strictly temperate. Address,
MODEL, care Clay-Worker.

FOR SALE.

FOR BRICK KILNS—Sixty-four wrought-iron buck-stays eighteen feet long; eight wrought-iron buck-stays fourteen feet long, made of two T rails with truss-rods, etc., complete. Also the following cast-iron buck-stays: Three stays 8" x 12 feet, fifteen stays 12" x 12 feet, four stays 12" x 13 feet, two stays 12" x 11 feet. EVENS & HOWARD, BRICK CO.,
12-tf-1 St. Louis, Mo.

Mention THE CLAY-WORKER.
WHEN WRITING TO ADVERTISERS
Mention THE CLAY-WORKER.

ALL WE CLAIM.

When we claim we can save half your oil bills, when we claim that

THE CROSS OIL FILTER

Is the best, most reliable filter on the market. These claims are substantiated by every filter that leaves our factory.

We'll both be satisfied when you have used one. Let us send it on approval at our expense.

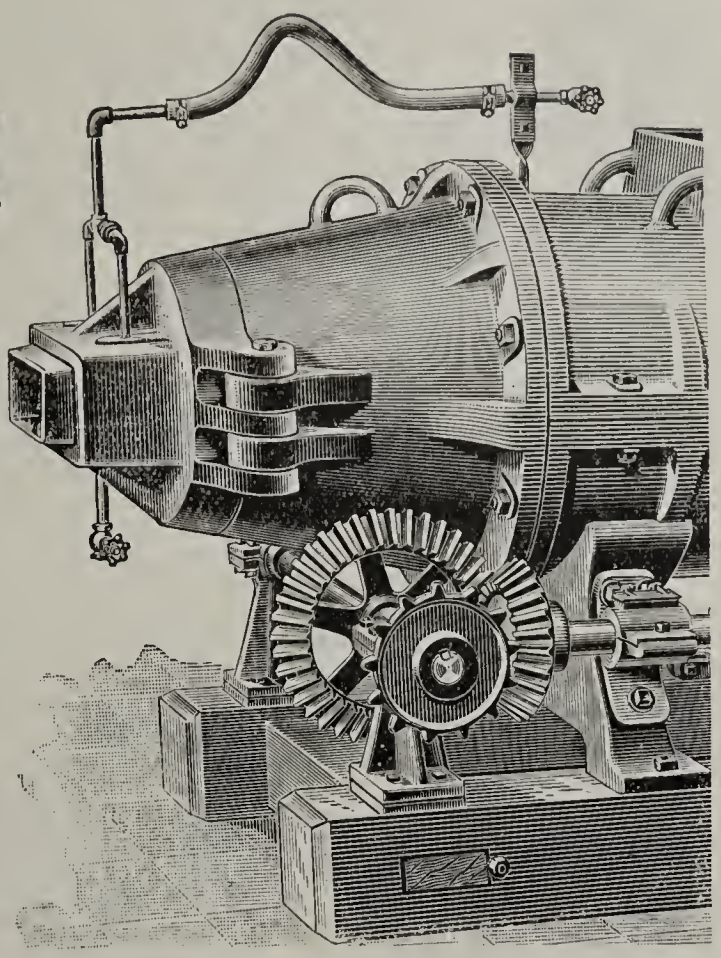
The Burt Manufacturing Co.,
Akron, Ohio, U. S. A.
Largest manufacturers of Oil Filters in the World.

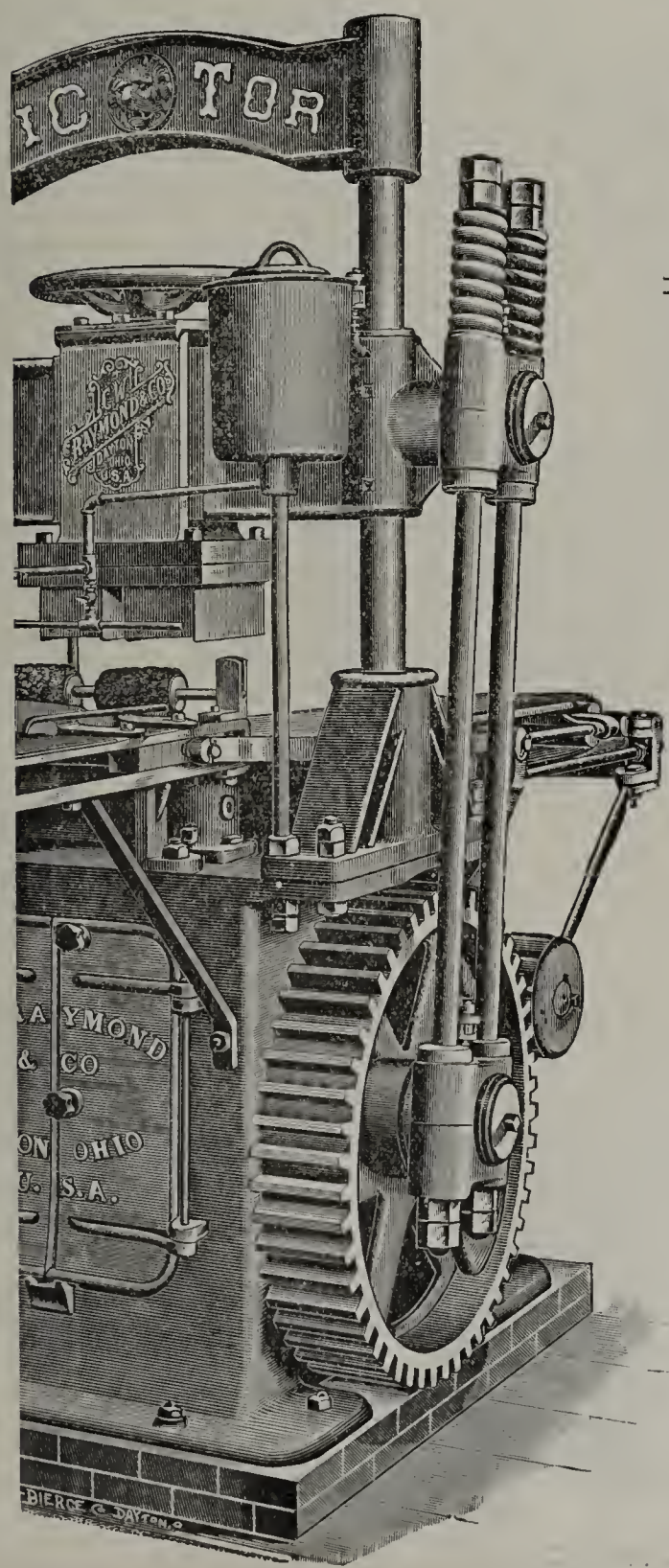
We also manufacture the BURT EXHAUST HEAD.

Better Brick

ARE PRODUCED BY RAYMOND
RELIABLE BRICK MACHINERY

than by any other. The Machine is not only reliable, but it makes a reliable quantity and quality of brick. Therefore, when we say reliable, we mean it.





What's the Use of Argument?

You can't beat a Raymond Re-Press. Not only the oldest in the market, but the simplest and best. Absolutely no repairs in years. Over 400 Raymond Re-Presses in daily use.

The C. W. Raymond Co.

DAYTON, OHIO.

NEW YORK OFFICE,
Room 40, 39 and 41 Cortland Street.
PITTSBURGH OFFICE,
1519 Park Building.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE BRICK AND TERRA COTTA LINES are rather slow, but there appears to be plenty of work in the way of small contracts. The people interested in this industry do not appear to be worrying at all over the situation, as they feel confident that plenty of work is in store for them in the future. This feeling is particularly the outgrowth of the re-election of McKinley. It is said that contractors are doing a great deal of figuring on future work and when the time comes the clay-workers will come in for their share.

It is reported that A. L. Grinstead and Mr. Davenport have entered into a compact to burn a kiln of 100,000 brick in or near Flora, Oregon, next summer. The clay in that section is excellent for that purpose.

The Southern Pacific Railroad Company has let a contract for a large number of brick to be used in the construction of several tunnels to be made near San Francisco in making the cut-off from Third and Townsend streets, out of the city.

Word comes from Honolulu, Hawaii, that work on the front elevation of the Stangenwald Block in that city is delayed by lack of pressed brick. Some time ago the contractor discovered that he was 4,000 bricks short of the number which he should have received according to the manifest. The coast firm supplying the brick was notified of the shortage, but instead of sending on the required 4,000 bricks, they wrote saying there must have been a mistake in the count at Honolulu. An urgent request was then sent for the brick, and all but about 1,500 have arrived.

The Pierce Bros. and William Drought have recently finished a kiln of brick at Cayucas, Cal.

The fire clay and brick works at Armington, Montana, have finished their summer contract and have temporarily closed down. The summer has been quite profitable, and Mr. Voight is looking forward to a large increase in the business the coming year.

An inquiry has reached the Chamber of Commerce of Salem, Oregon, regarding a location for a factory for the manufacture of earthenware and porcelain. The inquiry is from a firm that has had a good deal of experience in the work and proposes to erect a large plant in Oregon in the near future, providing good potters' clay can be found in sufficient quantities to justify its establishment. The officials of the Chamber of Commerce are very anxious to find out if clay suitable for this purpose can be found in the vicinity of Salem.

Harry C. Smith is busy molding several thousand brick, which he will burn at his kiln in Burns, Oregon, in a few days.

The Washington Brick, Lime & Manufacturing Company is developing the immense clay deposits which stretch for fifty miles along the line of the O., R. & N. Co., near Spokane, Wash. The company has a brick plant in operation at Freeman, about eighteen miles southeast of Spokane. Martin L. Bergman, a tile manufacturer, who owns a small plant at Mica, Wash., is said to be preparing for active work on a 320-acre tract a short distance from Mica, or about ten miles from Spokane. A number of other companies are also considering the establishment of plants for the purpose of developing the clay deposits. The Washington Company began work on its Freeman plant last spring. The plant is not yet complete, though the company has spent $15,000 there. At present the force of the company is directed toward the completion of a huge dryer for brick, that the plant may be operated all winter. The dryer will increase the expenditures on the plant to $20,000. The development work of the company was started on a huge bank of fine dark clay immediately beside the railroad. In July the first kiln of brick was fired. The capacity of the plant at this time is 40,000 brick a day. The dryer the company is building is designed for use in preparing the brick for the kilns. It consists of six long tunnels, with brick sides, into which raw brick are to be placed. Steam will be used to heat the tunnels, which will have a capacity of 45,000 brick a day. The capacity of the yard will be increased to 50,000 brick a day with the advent of warm weather next year, and later to 75,000. The plant at Freeman was established to take the place of the company's plant at Spokane, abandoned this year because its deposits were exhausted.

A new brickyard is to be opened in Dawson next spring, and W. H. Welsh, the promoter, who is now in Seattle, Wash., purchasing modern brickmaking machinery, says that many brick dwellings will be put up in that city next summer. Last year Mr. Welsh started a small brickyard on the Klondike, a mile above Dawson, and did a good business from the beginning. He could not supply sufficient brick to meet the demand. Mr. Welsh intends to purchase two modern brickmaking machines. When in operation the yard will turn out 30,000 brick a day.

Mr. Gibson's brick plant, at Missoula, Mont., has just shipped 100,000 brick to the new sawmill at Lothrop and is preparing to ship many more to other points in Missoula county. The new corporation recently formed will also begin to make some extensive shipments of brick, and will be in the field soon for other products of a similar nature.

A company has been organized in Ravalli county, Montana, for the purpose of manufacturing pottery from the pottery and fire clay beds which have been found in that vicinity.

The first shut-down that has occurred for some months at the plant of the Seattle Brick and Tile Company, located at South Seattle, Wash., happened last month. The cold weather that prevailed for several days did much damage to the steam pipes of the plant, and it became necessary to close down for repairs. Manager Neidergaeseis says that trade is very good for this time of the year, and that everything points to a busy season in his business. His company ships large quantities of red brick to all parts of Washington.

The drain tile plant, owned by John B. Raine, has been given a trial and worked satisfactorily. The plant is located in the peatland district in Orange county, California, where the pipe will be largely used in the draining of the wet lands. A large body of clay close to the railroad has been uncovered, and the plant located close to the road. By so doing, much expense will be saved in shipping the finished product. J. L. Lawrence, an experienced tile maker, has been secured by the management to take charge of the plant and the product turned out is expected to compare favorably with the best manufactured anywhere.

Mr. McPherson, of San Francisco, has been in Suisun, Cal., recently, looking over the situation with a view to establishing a pottery works. Mr. McPherson is the representative of the Steiger Terra Cotta and Pottery Works, of South San Francisco.

SUNSET.

San Francisco, December 5.

ONE ADVANTAGE OF FOLDING-BEDS.

"John Jones! what do you mean by coming home at this hour of the night? A nice time for a respectable married man to be out, and me sitting here all alone with six children and you trapseing around to gin-mills and clubs and"——

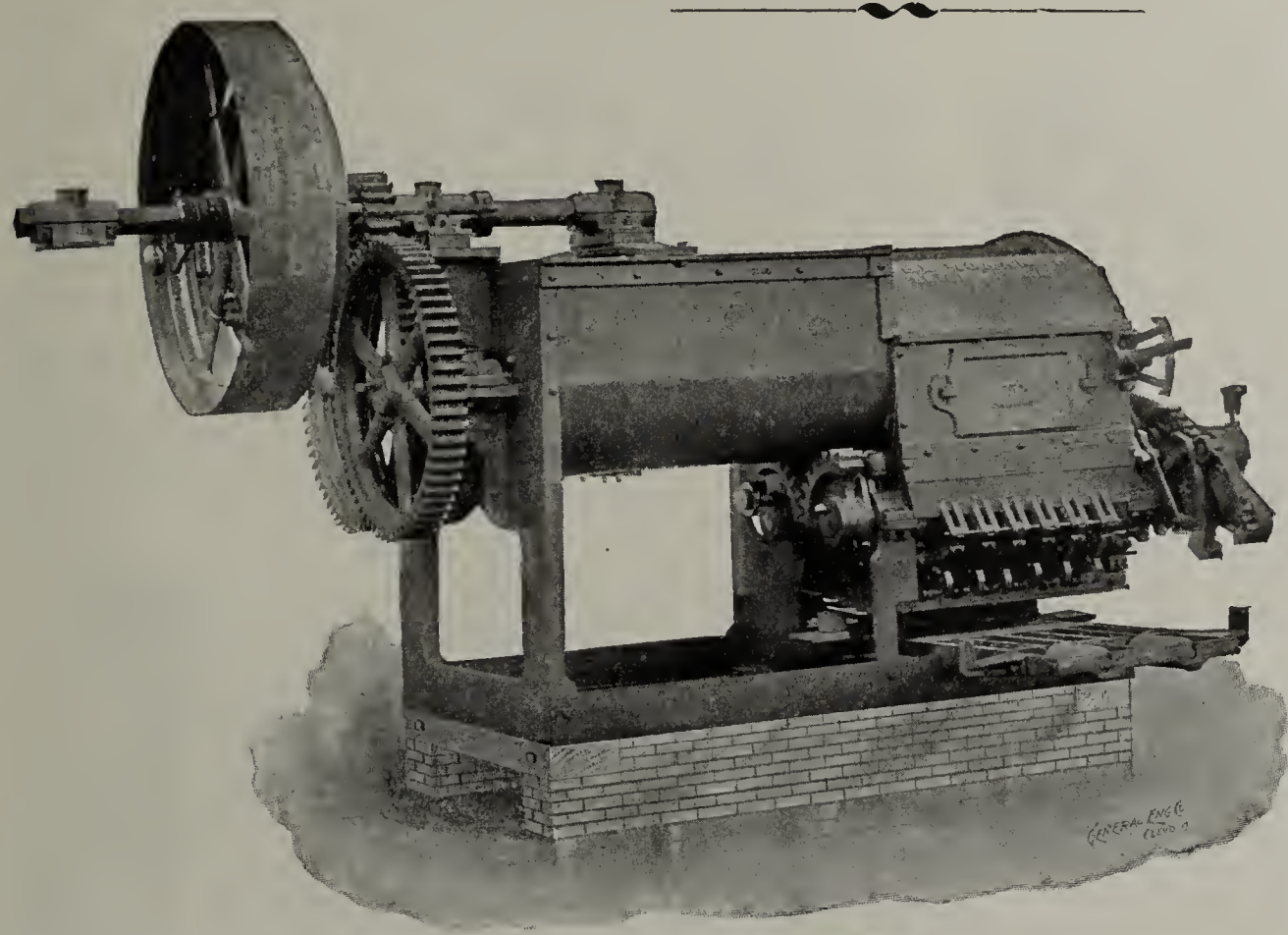
JOHN—"Oh, shut-up!"

LIGHT HOUSES

Do not have to hire bands or fire cannon to call attention to their shining—**THEY JUST SHINE.**

Thus it is with the two "soft-mud" machines we manufacture (one horizontal and one upright). **Each** is at the head of its respective class, and the number of each in use, (note the figures)

TELLS THE WHOLE STORY.



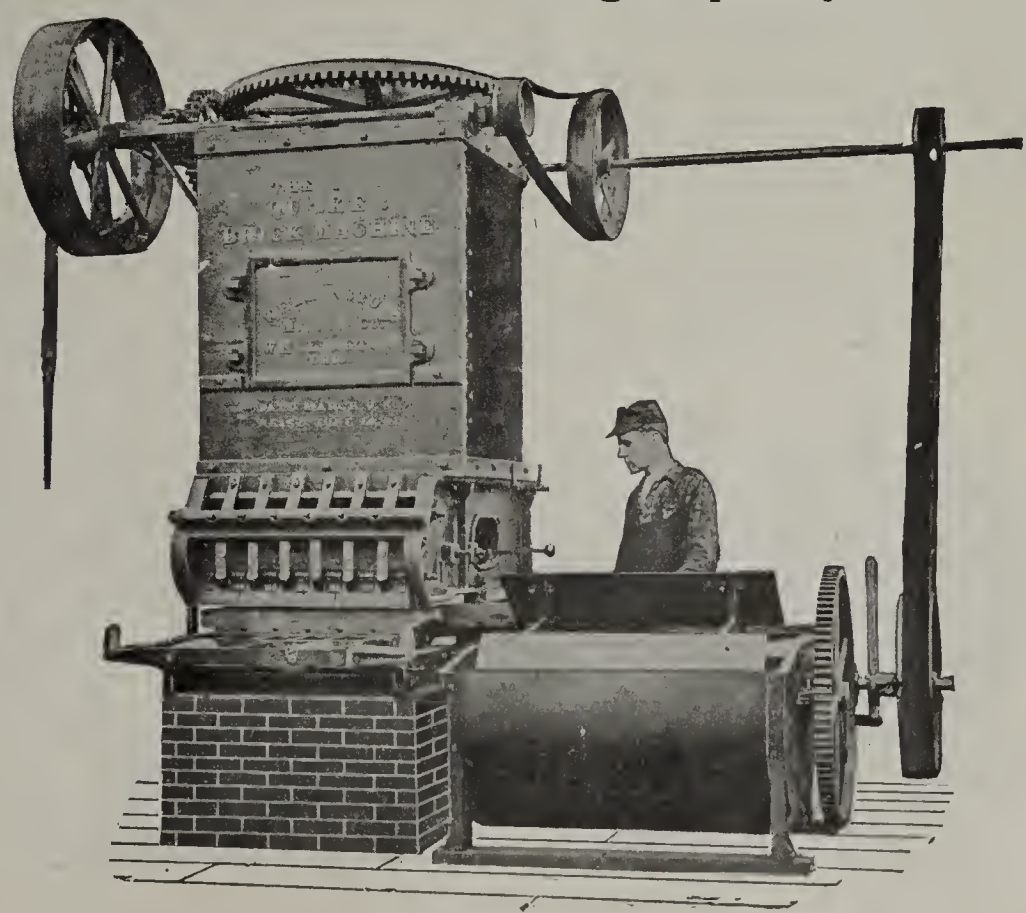
Over 100 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

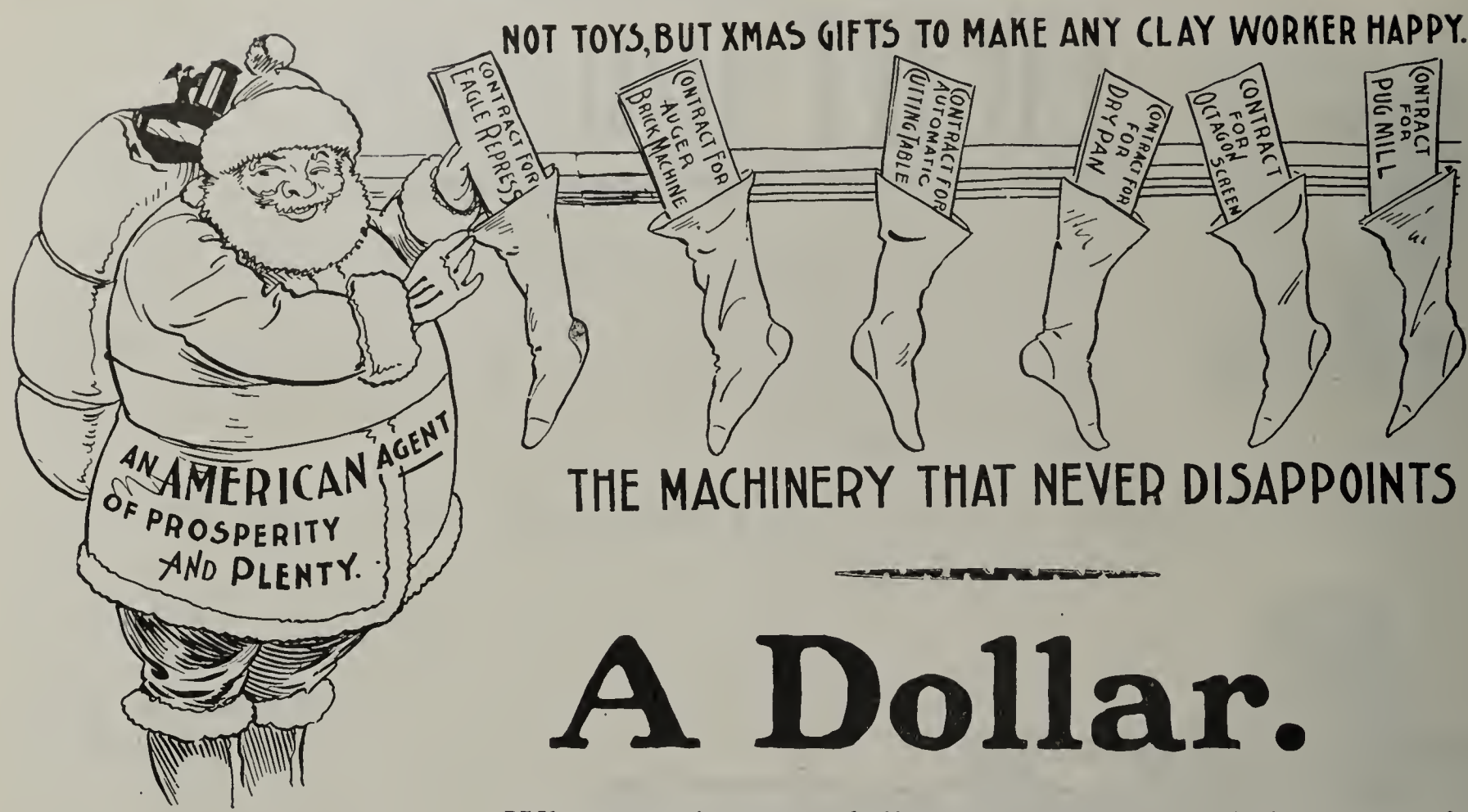
Our mould-sander is the best, simplest and cheapest.

With our Roller-bearing Brick Barrows you can wheel 20 per cent. more load and do it as easily. Order one subject to approval.



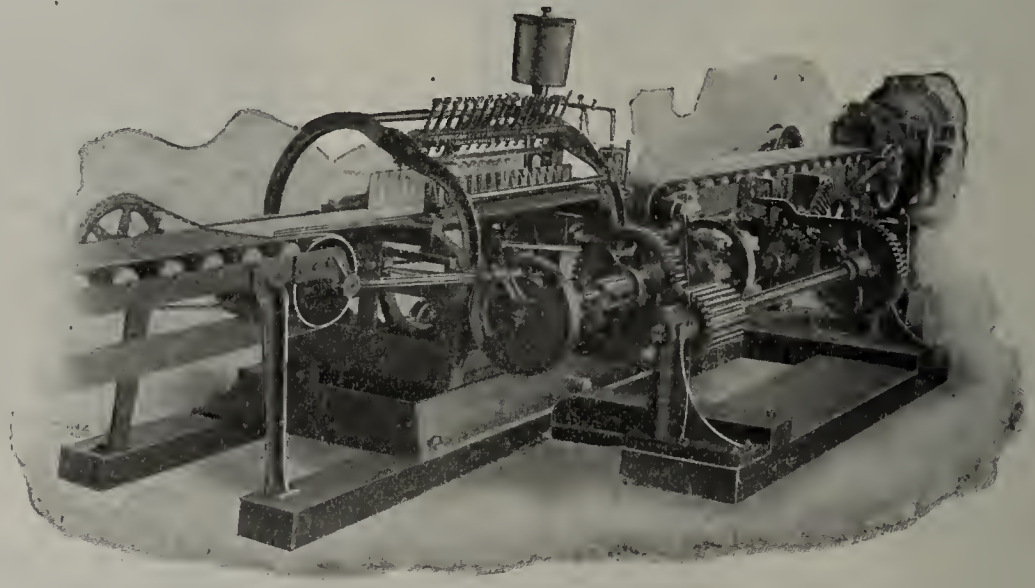
ALL OTHER SUPPLIES. Send for Catalogue.

The Wellington Machine Co.,
WELLINGTON, OHIO.



A Dollar.

When you invest a dollar you expect it to bring you a fair amount of interest. The investment which pays best is the one which will earn most with the least attention. You may get machinery cheaper than the "Built Right, Run Right" line, but it is'nt as good an investment. You lose on earnings and repairs many times over what you may have saved on cost. Here is one of the Machines which was awarded a medal at the Paris Exposition. It deserved it. There is no automatic cutter on the market to-day which will compare with it in superiority of movement, honesty of construction or faultlessness of operation. The oscillating movement is a wear resister, a wire saver and a smooth cutter. No unequal bricks. No clogging of the clay. No disappointments.



Automatic Reciprocal Down-Cut Oscillating Cutter. Send for Large Photo and Complete Description.

WE MANUFACTURE

Dry Press, Stiff Mud, Soft Mud, Pottery and Cement Machinery.

Complete Catalogue for the asking.

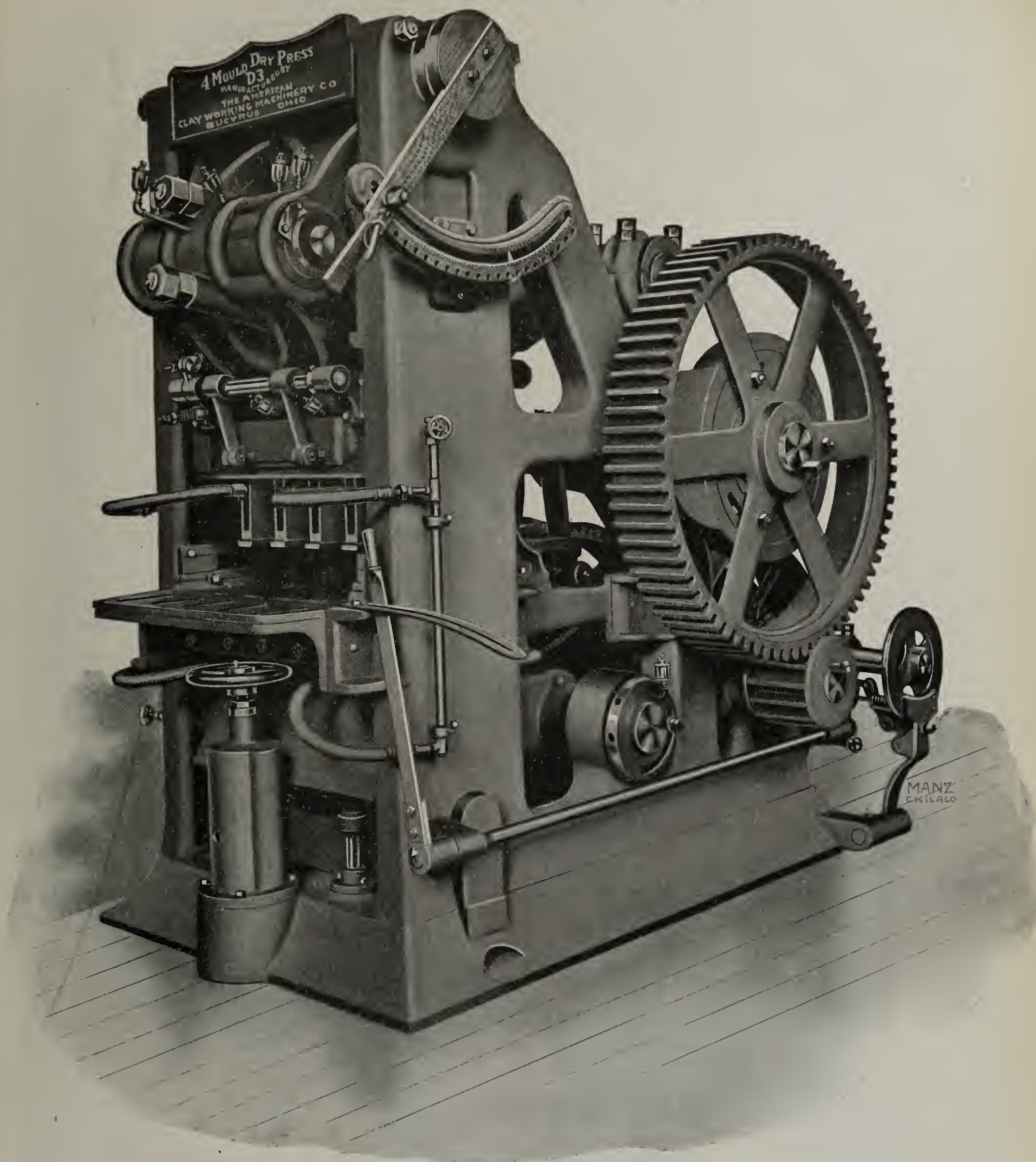
Medal Awarded at Paris and a Dozen Other International Expositions.

The American Clay-Working Machinery Co.

BUCYRUS, OHIO, U. S. A.

NEW YORK OFFICE, 39 and 41 Cortlandt St.

See Ads. on Pages 500 and 505.



NEW CENTURY DRY PRESS.

It's "BUILT RIGHT and RUNS RIGHT," what more could you ask? It's goodness is guaranteed. Write for complete description, etc. We are the largest manufacturers in the World of Dry Press, Stiff Mud, Soft Mud, Cement and Pottery Machinery. Medal awarded at the Paris Exposition.

New York Office, 39 and 41 Cortlandt St. **The American Clay-Working Machinery Co.,** BUCYRUS, OHIO, U. S. A.

WRITTEN FOR THE CLAY-WORKER.

IN AND ABOUT PITTSBURG.

A NEW POTTERY plant is projected at Waynesburg, Pa., capitalists of that town being the interested parties.

The Consolidated Crown Fire Brick Company, of Akron, O., has placed some large orders for its well-known products in the Pittsburg district the past month.

The Sharon Coal and Limestone Company is a newly chartered concern at Sharon, Pa., which may engage in the brick business.

The Warwick Pottery plant at Wheeling, W. Va., has many large contracts booked, and the same is true of the Wheeling Pottery plant at Wheeling.

Reed W. Blair & Co., of Pittsburg, are filling large orders for clay and silica brick and for Portland cement. This company is the Pittsburg representative of the well-known Savage Hill Firebrick Company.

The Pittsburg & Buffalo Company is one of the new Pittsburg concerns to engage in the brick industry. This firm also operates coal mines and stone quarries. Offices have been opened in the Park Building.

The unusual activity in real estate about Pittsburg indicates extensive building operations for the next few months, and big orders for building brick are being placed. The mills and factories have lately been taking great quantities of silica and firebrick, and the many new plants to be erected at once will require a great amount of these products.

The finishing touches are now being put on the new skyscraper erected by the People's Savings Bank at the corner of Smithfield street and Fourth avenue. It is a beautiful twelve-story pressed brick structure and will be ready for occupancy the first of the year.

The Pressed Steel Car Company are making some extensive improvements involving large brick contracts at their plant at Neville Island.

The structural work of the new Union Depot being erected by the Pennsylvania road in this city, is now well under way, and the brick work will be begun in a month or so. Originally the plans were for a twelve-story structure, but another story has been added.

The Wallaceton Firebrick Company, of Wallaceton, Pa., has lately received several large orders for their well-known Clearfield County clay products.

The Sandy Ridge Firebrick Company, of Sandy Ridge, Center County, Pa., through their Pittsburg agents, Messrs. Booth and Flynn, are securing many important orders, and their plant is one of the busy central Pennsylvania clay concerns.

The tile and firebrick plant of Kier Bros., at Salina, Pa., has been running full time during the past year and the firm has many orders booked for the coming year. The Pittsburg office of this company is located in the Stevenson Building.

The Dunbar (Pa.) Firebrick Company is filling many orders for high grade furnace brick, as well as for beehive and by-product coke over brick.

The proposed mammoth plant to be built by the American Bridge Company in the Pittsburg district will afford brickmakers a market for a large amount of their product.

The W. A. Humphrise Brick Company, of Gratztown, Pa., is operating their plant to its full capacity. This firm is receiving many orders particularly for their firebrick and coke oven brick.

E. S. McLain & Son is one of the well-known Pittsburg firebrick manufacturing concerns which is enjoying a big sale of its output.

The loss sustained by Sankey Bros., of Pittsburg, by the recent fire which destroyed some of the kilns at the plant at the head of Twenty-first street, has been repaired, and the well-known firm is now busy turning out their product to fill the many orders which have accumulated.

The wonderful developments in the clay industry of the Allegheny Valley noted in this column last month are still continuing. Many of the brickmaking firms located in and about Pittsburg are turning to this new field in anticipaton of the depletion of their clay deposits at their present plants. The Allegheny Valley is admitted by all Pittsburg brickmakers to be the coming center of this industry for Pittsburg. While the clays of that valley are all that could be desired for brickmaking, there are other natural resources there which the chemists are now examining and which will add new advantages to brickmakers who locate there.

The Park Quarries Stone and Brick Company, which was chartered last month and will erect a large brick plant at Park Quarries, near Freedom, Pa., will also erect 100 dwellings there to accommodate their employes. The new plant will be able to turn out 100,000 building brick per day. The capital stock, $150,000, has all been subscribed.

The silica and firebrick plant of the Pittsburg & Buffalo Company at White Rock, on the Allegheny River, is now undergoing many additions.

The $1,000,000 office building to be erected in the business section of Pittsburg by H. C. Frick, formerly chairman of the Carnegie Steel Company, Limited, will require big orders of brick and clay products.

Valuable graphite deposits are reported to have been discovered in Fulton County, Pa. It is said that workmen repairing the highway dumped at least $2,000 worth of the product on the road before its value was discovered.

GILBERT.

A CHRISTMAS CATASTROPHE.

EDITH—"Oh, Percy, your present was so beautiful! And you unintentionally left the price-tag on—forty dollars."

PERCY—"Oh, how careless of me!"

EDITH—"And I see you bought it at Dacey's. And I know you wouldn't mind taking it back and exchanging it for one of those lovely forty-dollar brooches they have there, would you?"

PERCY—"Oh, not at all! With pleasure.

PERCY (*an hour later, in his room*)—"This is what comes of buying a three-dollar-and-ninety-eight cent ring and sticking a forty-dollar tag on it! Oh, Lord! won't somebody please kick me!"

Notice to the PUBLIC.

St. Louis, Mo., December 1, 1900.

We are the owners of United States Letters Patent granted to M. F. Williams, for Crusher and Pulverizer, dated August 31st, 1897, No. 589,236. Within three months of the grant of this patent, we found that the same had been infringed by the St. Louis Pulverizer Co., and Schoellhorn-Albrecht Machine Co, and in November 1897, we brought suit in the United States Circuit Court, at St. Louis, against the St. Louis Pulverizer Co., and Schoellhorn-Albrecht Machine Co. This suit has been bitterly contested, but the result has been a complete victory for us, sustaining our patent and finding it infringed.

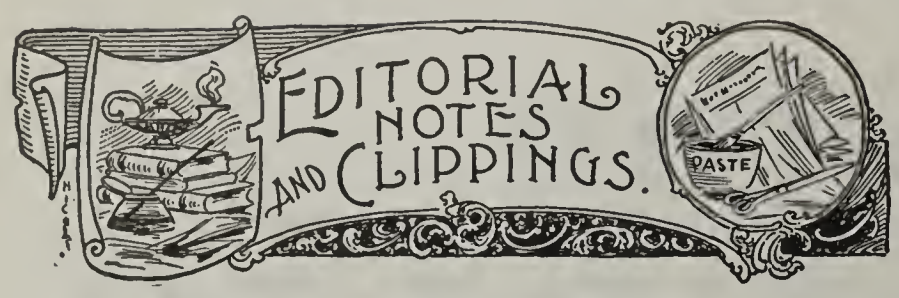
Every one who has made, used or sold, without our authority, a Crusher and Pulverizer embodying in its construction the invention covered by the claims of our said patent of August 31st, 1897, since August 31st, 1897, has infringed our rights under this said patent, and we propose to hold such infringers accountable to us, and prevent the further manufacture, use, or sale of such devices, made, used, or sold, without our authority.

The purpose of this notice is that you may be fully advised of our rights in the premises, and of the claims which we make. This is no idle threat. Pending the litigation between our company and the St. Louis Pulverizer Co., and Schoellhorn-Albrecht Machine Co., we have practically remained silent, awaiting the judgement of the court in regard to our rights. However, from now on we shall proceed to apply for injunctions and bring suit for damages and profits against any and all who have made, used, or sold without our authority, Crushers and Pulverizers, covered by our said patent, or any other patent controlled by us. We own seven other patents on our several types of hammer machines, and many more are pending in the United States Patent Office.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.,

MILTON F. WILLIAMS, President.

2701-2707 North Broadway, ***ST. LOUIS, MO., U. S. A.***



W. J. Wilkins, Florence, S. C., is in the market for some brick machinery.

G. A. Coleman ,of Steubenville, O., will build a new brick plant at New Galilee, Pa.

Colonel O. F. Bledsoe is at the head of a new brick plant to be established in Grenada, Miss.

The Columbia (Pa.) Brick Company was slightly damaged by fire on the 6th of this month.

A new red brick plant, in which P. B. Cryder is interested, will be established at Eagleville, Pa.

We are advised that Marcus E. Wells, Box 383, Seattle, Wash., will start a brick plant there in the near future.

C. E. Perry, of Ridgeland, S. C., writes that he contemplates going into the brick business at that point in a short time.

The Meyer's brickyard, at Farmingdale, L. I., N. Y., was slightly damaged by fire, which started in the kiln sheds.

The Sycamore Vitrified Brick Company has been chartered to manufacture brick at Independence, Kan. Capital stock, $40,000.

The Harrisburg Foundry and Machine Works have recently installed a Cross oil filter, made by The Burt Manufacturing Company, of Akron, O.

W. F. Heidenrich contemplates moving his brick plant from Hedrick, Ia., to Mason City, Ia., on account of the superiority of the clay at the latter point.

The Beatty Fire Clay Company, of Magnolia, O., has changed its name to "the Whitacre Company." J. J. Whitacre is president and Kate Whitacre is secretary.

B. F. Wasson will abandon his old brick plant at Everett, Wash., and erect a new one on the other side of the city, which he will equip with first-class machinery.

The Green-Hunter Paving Brick Company, at Thurber, Tex., have had an unusually busy season. Among recent shipments was a train load of paving brick to Santiago, Cuba.

Jacob Weber is making a number of improvements in his brick plant at Perkasie, Pa. Mr. Weber reports a good season, with prospects for a still better trade next year.

The Manitowoc (Wis.) Clay Company has filed articles of incorporation. E. S. Hoe, L. R. Howell and L. F. Mettelman are the incorporators. The company has a capital stock of $15,000.

F. A. Burrows, 1118 Plain street, Columbia, S. C., writes for a copy of Clay-Worker, as he contemplates going into the brick business in the spring and wants to get posted as to brick machinery.

The Hoosier Brick Company is constructing a kiln at its plant, at New Albany, Ind., that will have a capacity of 40,000 brick. This will bring the yearly capacity of the plant up to 5,000,000 brick.

George I. Boswell is at the head of a new company that has been organized at Coffeyville, Kan., to manufacture brick. A plant of 100,000 daily capacity will be built, work on which will be commenced at once.

The West Virginia Fire Clay Company, of Thornton, near Grafton, Va., has been incorporated, with $200,000 capital, by F. S. Lee, of Thornton; G. C. Lee, of Belington, W. Va.; H. M. Lee, A. Fleming and J. F. Fleming, of Scottdale, Pa. The company owns, near Thornton, what is said to be one of the finest beds of fire clay in the United States.

Charles McKinney, an employe at the T. B. Townsend Brick and Constructing Company's plant, at Zanesville, was badly burned by an explosion of gas, which occurred while he was repairing one of the furnaces.

The main building of the Red Wing (Minn.) Stoneware Company's plant was destroyed by fire November 22. The loss is estimated at $25,000, partly covered by insurance. The burned portion will be rebuilt at once.

The dryer at the new plant of the Waynesburgh (Pa.) Brick Company was totally destroyed by fire last month. Too strong a pressure of gas is supopsed to have been the cause. A new dryer will be built without delay.

The Lancaster (N. Y.) Brick Company will make a number of improvements in its plant, making it complete and modern in every particular, putting in new engines, boilers and brick machinery and building a continuous kiln.

The Diamond Brick Company has been incorporated to manufacture brick at Barberton, O., with a capital stock of $100,000. O. C. Barber, E. M. Buel, Charles C. Benner, F. H. Adams and A. H. Commins are incorporators.

The Greensburg (Pa.) Brick Works, owned by F. Perfley, of Ludwick, was burned to the ground early in the morning of November 20. Origin of the flames is unknown. The loss is estimated at $7,000, on which there is some insurance.

The brick plant of F. G. Banker, at Greenfield, Ind., was almost totally destroyed by fire early the morning of the 1st inst. The loss is about $4,000, on which there is no insurance. This is the second fire Mr. Banker has had in the last five years.

The Boonville (Mo.) Vitrified Brick and Tiling Company has filed articles of incorporation with the Secretary of State. The stockholders are: D. Edwards, W. Speed Stephens and Dr. A. C. Jacobs, of Boonville, and L. C. Nelson and B. M. Proetz, of St. Louis.

John W. Channel, a well-known brickmaker of Dayton, Ill., died suddenly at his home in that city, as a result of heart trouble. Mr. Channel moved to Illinois from Ohio nearly fifty years ago and had been engaged in the manufacture of brick for many years.

N. B. Hedges, president and treasurer of the Flint Brick Company, Des Moines, Ia., has disposed of his interests in Marcus Younkers, who will take charge of the property the first of the year. This plant is one of the largest and best equipped brick works in Iowa.

A large fire brick plant will be established at Anniston, Ala. W. A. Scarbrough and J. T. Gardner are interested. Preparations are already under way for getting the plant in operation, and it is the company's desire to have the plant completed in a couple of months.

The Philipsburg Fire Brick Works, Philadelphia, Pa., are installing some additional machinery in order to increase their capacity and so enable them to meet the steadily increasing demand for their product. When the machinery is in they will have a daily capacity of 80,000 brick.

The kiln shed at L. B. Platt's brickyard, at Essex Junction, Vt., became overweighted by the heavy snow which fell in that vicinity the latter part of last month, and fell in. This seems like a fairy tale to people in this part of the country, where no snow has been seen since last winter.

The Burns Fire Brick Company is the name of a new concern that has been organized to manufacture brick at Williamsport, Pa. John Burns, until lately associated with the fire brick works at Mill Hall, will be general manager. They have secured a valuable bed of fire clay in an adjoining county. The quality of the clay is said to be very fine. A railroad will

[CONTINUED ON PAGE 478.]

THE OFFICIAL ROUTE

TO THE

National Brickmakers Convention

At OLD POINT COMFORT, VA.,

(February 11th to 16th, 1901.)

IS THE PICTURESQUE

Chesapeake & Ohio Ry.,

The Only Line to Old Point Comfort.

The Chesapeake & Ohio Railway, starting from Cincinnati or Louisville, with connecting lines from all cities in the West, Northwest and Southwest, is renowned for its superior train service, its dining cars having a reputation of National extent, also for its splendid track and for the beauty and variety of its Scenery. Canyons, Mountains, Valleys and Rivers. Through battlefields and other historic sections of Virginia including Charlottesville and the home of Thomas Jefferson, Richmond, the old Confederate Capital, Williamsburg, the Colonial Capital and Newport News, the great Seaport with its Ship Yards and Battleships. The battle between the Merimac and Monitor was fought in this harbor. For descriptive Catalogue, Address

C. B. RYAN, Ass't Gen'l Pass. Agent,

CINCINNATI, OHIO.

EDITORIAL NOTES AND CLIPPINGS—Continued.

be run from the clay deposit direct to the works. The company has purchased what was formerly the Williamsport brick works, which is being remodeled and when completed will have a yearly capacity of from six to ten million.

Wm. Finnegan, is making a number of improvements in his brick plant at Green Bay, Wis. New boiler and machine rooms will be built of brick, thus being fire proof. Mr. Finnegan has had a very successful season and is preparing in time for the increased trade, which is sure to come next year.

The Webster City (Iowa) brick and tile plant, owned by Soule, Hogan & Funk, is being torn down and will be replaced by a new up-to-date plant, equipped with modern machinery and appliances. All of the buildings will be of brick. They expect to be ready for operation early the coming season.

The Natchez (Miss.) Brick and Manufacturing Company has been reorganized. The old plant will be overhauled, modern machinery put in and the capacity increased to 40,000 brick daily. The officers of the company are: R. E. Bost, president; R. L. Parker, vice-president, and E. W. Chamberlain, secretary and treasurer.

In a recent letter, renewing his subscription to The Clay-Worker, John Coupe, Mt. Savage, Md., says that valuable fire clay deposits, as well as large veins of coal, have recently been discovered on the Trimble property, Mt. Savage, Md. Mr. Coupe says he will be pleased to give further particulars to any one interested.

Dr. C. A. Kefauver and L. W. Creager, of Circleville, O., will establish a brick and tile plant on the former's farm, near Stoutsville, O. The plant will be located along the C. & M. V. road and along the pipe line so gas can be used. They expect to be ready for business by spring and will employ quite a force of workmen.

A. J. Blumensteil, Galveston, Tex., writes that he intends to go into the brick business in the spring, and would like to correspond with soft mud brick machine manufacturers, especially those using three brick molds. Parties desiring to correspond with Mr. Blumensteil can address him direct at 3522 Avenue L, Galveston.

In order to meet the increasing demand for their product the Conococheague Brick Works, of Williamsport, Pa., of which Victor Cushwa & Sons are proprietors, will be enlarged and improved. Among the improvements will be a steam dry house, which will enable them to turn out brick at the rate of 40,000 daily all through the winter.

An accident at the Eastern Paving Brick Company's kilns, at Catskill, N. Y., resulted in the death of an Italian laborer, Erasmo Cazaregola, and serious injuries to several others. The accident was caused by the caving in of a kiln while it was being strengthened by laborers, all of whom were buried beneath a mass of brick and timber.

The Douglass-Whisler Brick Company, Vanport, Pa., is putting in an additional 100 horse power boiler, and will erect at least two more kilns. This will give the plant a daily capacity of about 30,000 brick. The company has orders booked for several months ahead, and expects, from the present outlook, that the coming year will be a busy and prosperous one.

The tile and brick plant of L. S. Baldridge & Co., at Mt. Pulaski, Ill., was totally destroyed by fire on the 6th. The plant had been running on full time until a few days previous, when it had been shut down for the winter. It is thought the fire was started by tramps. Insurance on the plant cuts the actual loss down to about $6,000. Mr. Baldridge states that he will at once rebuild.

The Buena Vista Fire Clay Brick plant, at Lexington, Va., was destroyed by fire the 13th inst. A roof was being put on a new kiln and caught fire, which soon spread to the entire plant. The machinery works, the valuable part of the plant, was a total loss. Loss, $30,000; insurance, $15,000. The plant is owned by the Southern Clay Product Company, whose owners mostly reside in Philadelphia. The plant will, in all probability, be rebuilt.

Jacob Abraham, the veteran brick manufacturer of Moline, Ill., has sold his brick plant to his son, Oscar Abraham, and August Karsten. The new firm will be known as Abraham & Karsten Brick Company.

In a recent letter M. E. Gregory, proprietor of the Brick, Terra Cotta and Supply Company, Corning, N. Y., says: "We have had a splendid trade this year. We have just finished building a large terra cotta kiln, extending floor space and are making other necessary improvements to the plant, which is now the largest in the State." This is the second kiln they have built this year. They have recently closed a contract for a dormitory building in New York city, for Columbia College.

Information to the effect that H. Brewer & Co., of Tecumseh, Mich., have become incorporate has been received by this office, and in response to our inquiry as to the particulars, they state that they have incorporated under the laws of Michigan, with a capital stock of $100,000. They further advise that there is absolutely no change whatever either in the name, the personnel, the shareholders or the active managers of the concern and that no such change is contemplated.

The Ligonier Silica Brick Company plant, at Kingston Station, near Ligonier, Pa., resumed operations in full about December 1, after a shut down of two months, caused by a slow market and need of repairs. Among improvements made may be mentioned the installation of a standard steam dryer, built by Standard Dry Kiln Company, Indianapolis, Ind. A new water tank has been erected and changes made in the machinery, making the plant one of the best equipped in this part of the State.

A peculiar case of theft was discovered recently at the works of the Donnelly Brick Company, on the road to Berlin. The company has two engines, one in the brick department and the other in the terra cotta department. It was found that thieves during the night had effected an entrance to the engine rooms through a window and by breaking down a door. They then stripped the engines of all the brass valves, cocks and other brass parts and the engines could not be run until these parts were replaced. Tower's brickyard was also visited by the thieves. They took a quantity of brass there also, besides tools, which they found in the blacksmith building.

The plant of the Chattahoochee Brick Company at Atlanta, Ga., was entirely destroyed by fire on December 3, entailing a loss of $50,000. The fire started in one of the engine rooms. The loss is total, as the company carried no insurance, having recently put in hydrants and a complete system of waterworks; but unfortunately two of the engines were being overhauled at the time, so that sufficient pressure could not be obtained to have any effect on the flames. Captain J. W. English, president of the company, says the plant will be rebuilt in a short time. They have several large orders on hand, having booked one for 5,000,000 the day previous to the fire.

Representatives of the Harbison & Walker Fire Brick Co., of Pittsburg, Pa., have purchased several hundred acres of valuable clay lands at Olive Hill, Carter county, Kentucky. A large plant will be built and the manufacture of fire brick carried on. The plant will have a daily output of 100,000 fire brick. It is expected to have the plant in operation early next year. The fire clays of Carter county, Kentucky, have attracted the attention of all the fire brick manufacturers of the country, especially the clay in and around Olive Hill, where the largest deposits of pure clay have been found. It is said many other manufacturers of fire brick contemplate building at Olive Hill in the near future.

A charter has been granted to the Hampton Roads (Va.) Brick Company. The company proposes to manufacture and

[CONTINUED ON PAGE 480.]

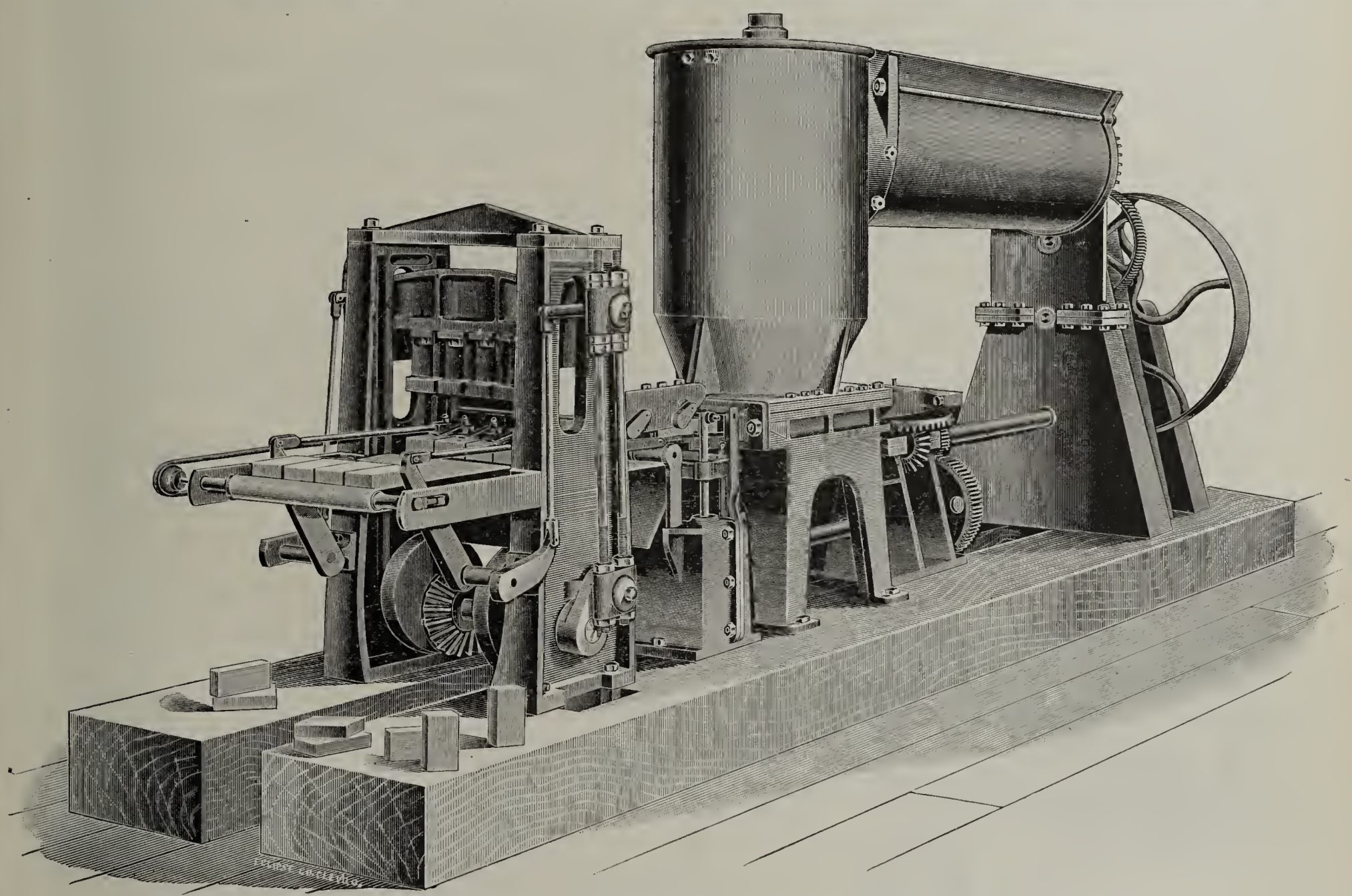
A Perfect Brick Machine.

STRONG, POWERFUL, SIMPLE and POSITIVE.

Absolutely Unbreakable. **Less Working Parts than any other Machine.**
Without Repressing Attachment.

The DICTATOR BRICK MACHINE will take the Clay or Shale as it comes from the bank or Dry Pan and automatically produce perfect repressed brick.

NO LAMINATION.



DICTATOR BRICK MACHINE. Capacity 40,000 Perfect Repressed Brick per day.

The only machine in the World, that will Automatically produce perfect Re=pressed Brick.

The Battenfeld Mfg. Co.,

Write for Catalogue. *922 Garfield Bldg, CLEVELAND, OHIO.*

EDITORIAL NOTES AND CLIPPINGS—Continued.

sell brick, tile pottery, artificial stone, terra cotta ware, etc. The officers of the concern are: Harry L. Turner, of Fall's Church, Va., president; W. H. Stewart, of Portsmouth, vice-president; Geo. M. Newell, Fall's Church, Va., secretary; Chas. A. Stewart, Fall's Church, Va., treasurer. These, with Vernon W. Long, of Lake City, Fla., are directors. The company will establish its works on the Nansemond river, where a fine quality of clay has been found in large quantities and where good shipping facilities by water are available. The principal office will be in Portsmouth.

The plant of the Canton and Cleveland Brick Company, at Waco, three miles from Canton, O,, on the Belden switch of the Carrollton branch of the W. & L. E. railroad, was totally destroyed by fire between 6 and 7 o'clock Sunday morning, December 10.

All the equipment, tools and machinery were destroyed. A. Buckeye engine and a battery of three boilers, with 250 horse-power in all, and three clay cars were destroyed, as well as thousands of feet of inch and a quarter pipe in the dryers. The machinery destroyed consisted of two dry pans, a 12-foot pug mill, two double repressers, an elevator, screens, the small cars containing the brick in the dryers, and some automatic machines.

The plant was built about fifteen years ago and was one of the first paving brick plants in that section. It was originally partly constructed by Richard Merley and was sold shortly afterward to a firm in which J. H. Higley and H. S. Belden were interested, who enlarged the plant. About ten years ago Peter Miller purchased an interest. It was called the Canton Brick Company until about three years ago, when the Canton plant was consolidated with another brick plant at Willow, near Cleveland. The plant was incorporated with a capital stock of $200,000 and was called the Canton and Cleveland Brick Company.

In speaking of the fire, Mr. Higley said: "The entire plant cost $50,000, and we carried $15,000 insurance. We will begin the work of rebuilding just as soon as the insurance is adjusted. Fortunately, the brick in the burning kilns were not in the least injured, and these, with a large supply in the stock sheds, will furnish enough to start on our new plant, which will be entire fire-proof."

As the Coal Went Down the Chute.

UNCLE EPH—"Gosh! it must cost a sight of money ter heat all these streets."

Reduced Fares

FROM

Boston, Mass., Providence, R. I.,

...TO...

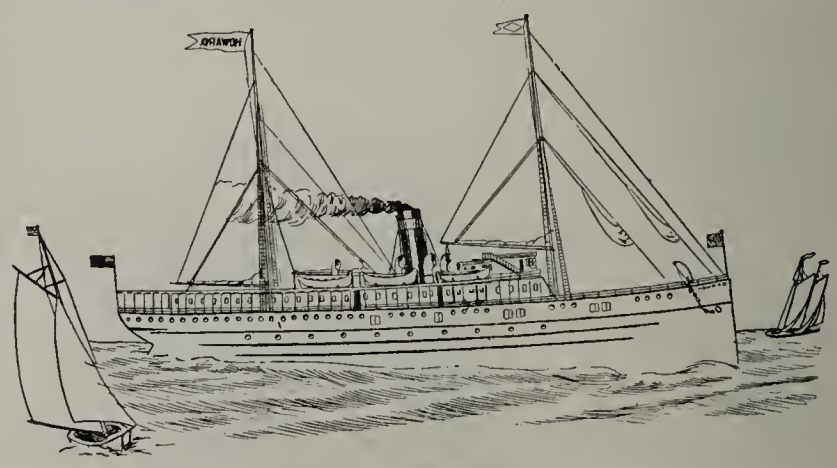
Old Point Comfort, Va., and Return,

...ACCOUNT...

National Brick Manufacturers' Convention,

...VIA...

"QUEEN OF SEA ROUTES"



Merchants & Miners Trans. Co.,

STEAMSHIP LINES.

Tickets on sale at Boston, Mass., Feb. 7 and 9, 1901.
At Providence, Feb. 8th, 1901.
Good to return until Feb. 28th, 1901.

Route 1. Steamer to Old Point, returning same way, Fare... **$15.00**

Route 2. Steamer to Old Point; Washington, Baltimore, thence steamer to starting point, Fare..... **$18.70**

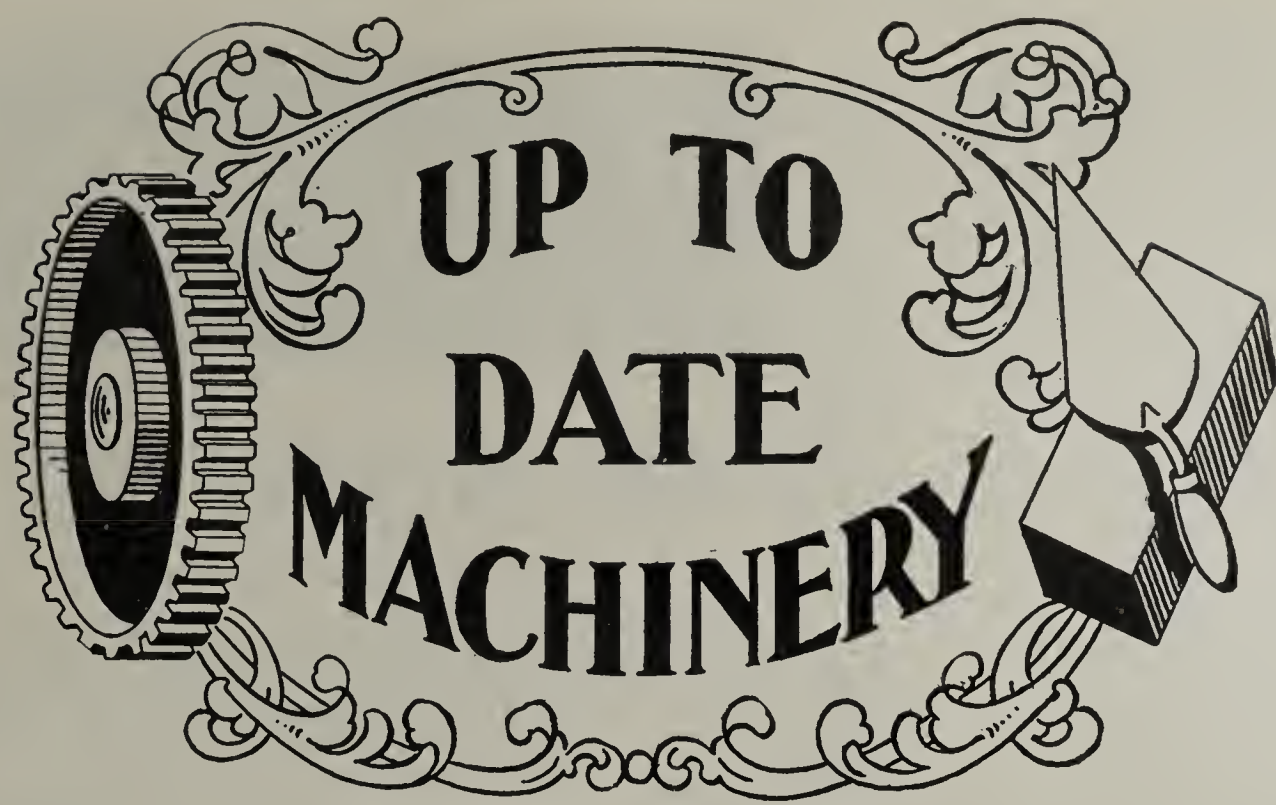
Route 3. Steamer to Old Point, Washington, rail to Philadelphia, New York, Fall River Line, Fare **$19.25**

Meals and State-room included on M. & M. T Co., Steamers.

Steamers leave Boston, 2 p. m.
Steamers leave Providence, 6 p. m.

For further information address Passenger Department M. & M. T. Co.

J. C. Whitney, T. M.,
W. P. Turner, G. P. A.
General Offices, BALTIMORE, MD.



When Buying New Machinery

Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front and Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.

DO YOU KNOW

We Manufacture

Stock or Front Bricks,
Ornamental or Shape Brick

...IN...

RED, GRANITE,
BUFF, GRAY
and MOTTLED.

The PROGRESS
BRICK PRESS.

Complete Brick Yard Equipments

Brick Yard Supplies.

Catalogue on Application.

We issue a Catalogue on Ornamental and Shape Bricks on application, and offer a liberal discount to dealers.

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. ***ST. LOUIS, MO.***

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED—Second-hand dry pan and pug mill, in good repair; also elevating apparatus. Address S. C.,
12 1 c Care Clay-Worker.

FOR SALE—Two tempering wheels, of the D. J. C. Arnold Works. Any one wishing particulars kindly address
ROESKE BROS.,
12 2 d Michigan City, Ind.

WANTED—Position as manager and burner of dry-press yard or as burner; understand burning with wood, coal or natural gas; applicants please give description of plant. J. C., care Clay-Worker. 12 1 c

FOR SALE—Splendid location for a pressed and vitrified brick plant; abundance of material, cheap fuel and cheap freight. Address A. H. KENNEDY,
12 1 d Rockport, Ind.

WANTED—Paying position on stiff mud yard by man experienced in Kiln building, burning, setting and machinery. Will give reference and come on trial to right place offering permanent employment. Address,
12-1-c W. E. L. care CLAY-WORKER.

SITUATION WANTED—As superintendent or general manager of brick works, dry press or plastic process, face brick or paving brick; will invest some money and accept stock for salary in new plant, or in plant fairly representing capital.
12 1 l W. D. R., care Clay-Worker.

FOR SALE—A BARGAIN—Forty-five cars manufactured by Wolff Drying Company, of Chicago, for drying stiff mud brick; also two transfer cars. These cars were in service less than one week. Address
BURNS FIRE BRICK CO.,
12 3 cm Williamsport, Pa.

POSITION WANTED—As manager by man of experience in the manufacture of all classes of clay goods, fire brick, tile, blocks—all shapes, common, hollow and other brick, tile, etc. Will take full charge of plant, up and down-draft and other kilns of all descriptions. Address E. M.,
12 1 c Care Clay-Worker.

WANTED, PARTNER—I have a first-class stiff mud brick plant, located on railroad track in a town of 15,000 people, and I want a partner who has a dry press outfit or one who wants to put in one; have first-class shale for making dry press brick and an abundance of same uncovered; want partner that can take charge and run yard. Address
12 2 d W. R. EUBANK, Paris, Tex.

FOR SALE—To close an estate, modern brick plant, the only one in a city of over 24,000 inhabitants; Pallet system, New Haven machine, engine large enough for two machines; superintendent's house, saw mill and barns on the premises. Brick can be made on this plant as cheaply as anywhere in New England. Everything in good repair. Address S. P. THAYER,
12 2 d North Adams, Mass.

WANTED—Competent foreman, to take charge of 20,000 day plant, stiff mud; must be thoroughly capable of managing men, building kilns, seeing to brick that are shipped and adjusting and keeping up machinery, time of men and managing entire yard. Give full particulars, when answering, as to what wages required, experience had and who last worked for. To commence March 1, 1901.
PAOLA BRICK AND TILE WORKS,
12 1 c Paola, Kan.

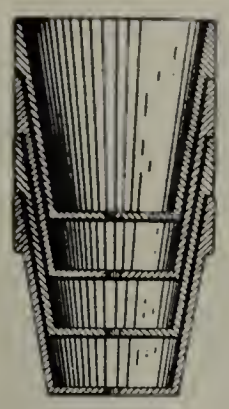
KENDALL & FLICK.
MANGANESE
FOR ALL USES.
BOOKLETS AND PRICES ON REQUEST.
618 PENNA. AVE. N. W. WASHINGTON, D. C.

The DUNN CONTINUOUS BRICK KILN.
H. C. DUNN, Patentee.
Constructed on Scientific principles. Draft and Combustion are perfect. Economical and Natural in operation. All firing is done from the top. There are no underground flues. Any brick burner can handle it. Cost of construction reduced to the minimum. Will burn all hard brick. Especially recommended for burning building brick. Will burn 8,000 American Standard size brick with one ton of good coal slack. We invite investigation. For full information address all communications to the Sole Agent for all Territory,
I. M. JUSTICE, Erie, Pa.

Brick Manufacturers

Who contemplate attending the Annual Meeting of the National Association to be held at
Old Point Comfort, Va.,
In February, should know that the
Old Dominion Line
Operates a Daily Service between Old Point or Norfolk, Va., and New York, offering an excellent opportunity for visiting the latter city. Express Steamships leave Norfolk, Va., daily, except Sunday, at 6:00 P. M., Old Point by annex Steamer for New York direct. For general information apply to railroad ticket agents, or to M. B. CROWELL, General Agent, Norfolk, Va.; J. F. MAYER, Agent, 1212 Main Street, Richmond, Va. H. B. WALKER, Traffic Manager, J. J. BROWN, Gen'l Pass. Agt. } New York, N. Y.

Conveyors
For Clayworking Industries.
WE HAVE just finished our new factory which more than doubles our capacity and are now in a position to execute quick delivery orders for up to-date equipment of Clay Working Concerns. Cut shows our Water Elevator which has met with much favor in many of the best yards in the country. New Catalogue now in press will be sent on request.
Buhl Malleable Company,
Detroit, Mich., U. S. A.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St., INDIANAPOLIS, IND.

For Tile and Brick Yards.

For handling Coal, Sand, Clay, Grain, Tan Bark, Cinders, Ores, Sawdust, Lime, Cement, etc. Also continuous Pan Conveyors.

Iowa Pipe and Tile Co., Des Moines, Iowa.

Borden & Selleck Co , Chicago:

Gentlemen—We have used the Harrison Conveyor for the past two years. It takes about ninety tons of clay per day from our dry pan and distributes it through our cellar. Gives good satisfaction. Yours truly, IOWA PIPE & TILE CO.

BORDEN & SELLECK CO., Mfrs. and Sole Agents, **48 & 50 Lake St., Chicago.**

Send for Illustrated Catalogue.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

The Belt for the Brick Yard

Is the one that is not impaired in length or kind of service, when subjected to excessive weather, moisture or dust conditions. There is only one constructed to withstand these without injury, and it is

LEVIATHAN BELTING.

Our customers bear us out in this, and a trial order will demonstrate it to you.

MAIN BELTING COMPANY,

1221-41 Carpenter St., Philadelphia, Pa.

55-57 Market St., CHICAGO. 120 Pearl St., BOSTON. 60 McGill St., MONTREAL.

Write for Samples and Price Lists.

FOR SALE—Ohio Tile Works. In good shape; good location, good trade; cheap. 10 3 c Address L., care Clay-Worker.

FOR SALE—One 40,000 capacity clay pulverizer, cheap; in good condition. Address 11 tf l PULVERIZER, care Clay-Worker.

WANTED—To purchase, for cash, the machinery and equipment for a complete paving, building, dry press brick plant, with ground, building and power; give full particulars as to quality and quantity of sand on or nearby the premises; also the freight rates or cartage to the immediate cities for demand of the building materials. Address, with all other particulars,
11 3 d H. P. B. Co., care Clay-Worker.

FOR SALE—At Winslow, N. J., a tract of land, bordering on the West Jersey & Sea Shore and New Jersey Southern railroads and within one-eighth mile of the Atlantic City & Cape May railroad, containing about sixty acres of clay, suitable for making buff, colored and other ornamental bricks. For further particulars apply to GEORGE CORHEAN,
11 3 c 203 Wainut Place, Philadelphia, Pa.

FOR SALE.

One 8 foot wet pan, wood frame.
Two 9-foot dry pans, wood frame.
One 9-foot dry pan, iron frame.
One stiff clay auger machine.

THE T. B. TOWNSEND BRICK & CONTRACTING CO.,
12 1 c Zanesville, O.

FOR SALE.

PATENT RIGHTS for manufacturing my speckled brick and terra cotta, in all colors.

PROCESS—Changing buff brick to blue-gray; the same mixture; no spraying.

SURE REMEDY to prevent light burnt brick and terra cotta from turning green in building. Address

WM. LENDEROTH.

Constructing Engineer of Brick and Terra Cotta Works, Kreischerville, Richmond Borough, N. Y. 4 tf d

BRICK MACHINERY FOR SALE.

One 6 mold Ross Keller Brick Machine, $2,500.

One 2 mold Whitaker Brick Machine, $800.

Also Disintegrators, Pulverizers,

Wheel Scrapers, Cars, Trucks, Pumps,

Boilers, Engines, Kiln Doors and Frames, Grates,

Steam Pumps, etc., in fact, the entire equipment of a large first-class brickyard.

Will sell the same in whole or in parts to suit.

For particulars and prices address

SCHOELLHORN-ALBRECHT MACHINE CO.,
12 tf d 420 N. Main St., St. Louis, Mo.

FOR SALE.

One Iron Standard Steam Power Machine, with pug-mill attached.

One Anderson Brick Machine, with 12-foot Pug Mill.

One new Brewer Crusher; one second-hand Brewer Crusher.

One Carnell Repress.

One Penfield Soft Mud Machine.

One 40-h. p. Boiler and Engine.

One Monarch Machine, used two summer seasons; in excellent repair.

One iron standard horse power brick machine.

Three "Reliable" hand power brick machines.

THE HORTON MFG. CO.,
12 tf d Painesville, Ohio.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
6 tf d Wellsburg, W. Va.

MANAGER OR SUPERINTENDENT—Is open to re-engagement, to take charge of manufacture of fire brick, hollow building block and vitrified clay product; is experienced and reliable. Address
10 tf d LAND, care Clay-Worker.

FOR SALE—One three-mold Andrus dry press; in good condition; would not be sold but for the fact we no longer make dry press brick; cheap for cash or on time to responsible parties.
COALDALE PAVING BRICK CO.,
9 tf r Birmingham, Ala.

WANTED—A situation as superintendent or foreman of terra cotta, tile or pressed brick plant. Understand all the details of making and burning porous terra cotta. Also the construction of kilns of all sorts. Satisfied with moderate salary if the situation is permanent. Best of references. Address
8 tf tr MILFORD, care Clay-Worker.

A GOOD MAN

Wants a situation as superintendent or general manager of a dry press brick plant. Understand thoroughly every detail of the business; expert in the manufacture of ornamental brick; also the production of flashed and mottled brick; good salary will be required and good service will be rendered; permanent, not temporary, situation wanted. Address, I. X. L.,
10 3 r Care Clay-Worker.

For Sale.

A Rare Opportunity to acquire a Splendid Clay Property.

A Successful paving brick plant, well equipped and peculiarly well situated, being in a territory that commands a fine market that will take all the pavers that can be made for years to come. The property includes 120 acres. Will sell all or a part. Good brick residenee on property; inexhaustible bank of fine shale and a five-foot vein of good coal beneath it. Purchasers ought to have a capital of $100,000. Considerable less will buy it, though the plant is easily worth $120,000.
For full particulars address,
I. O. A.
Care CLAYWORKER.

Eureka Brick Elevator, Made in Four Styles.

A slick profitable device for handling brick in kiln or boat.

A. C. Newton, Manufacturing Patentee, Crescent, N. Y.

MORRISON'S LATEST IMPROVED KILN

For Burning Building Brick.

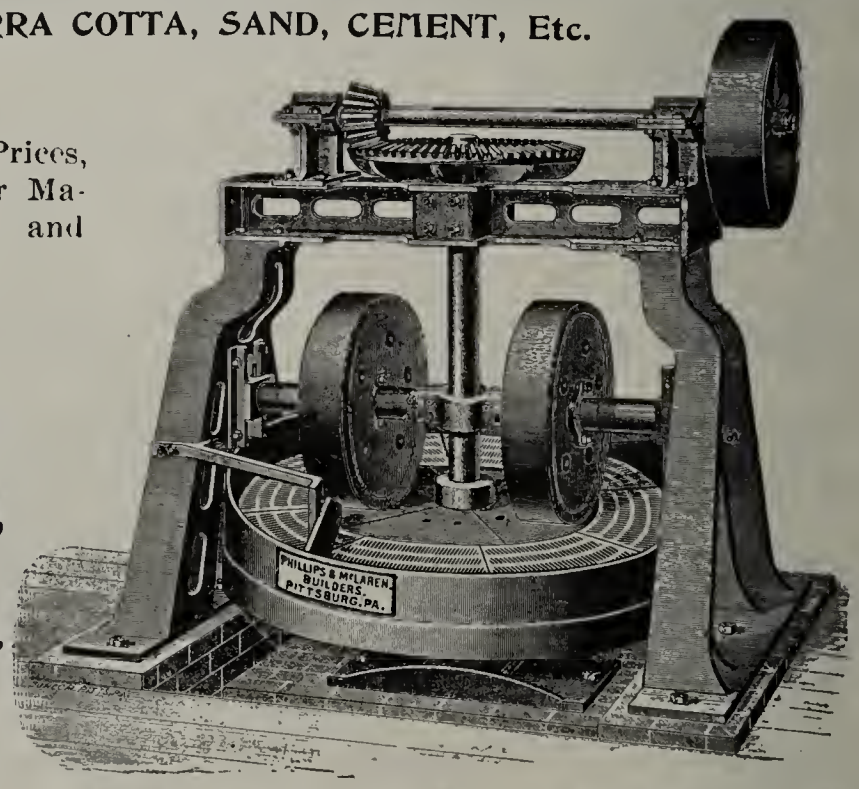
It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object. Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,
P. O. Box 335, Rome, Ga., U. S. A.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

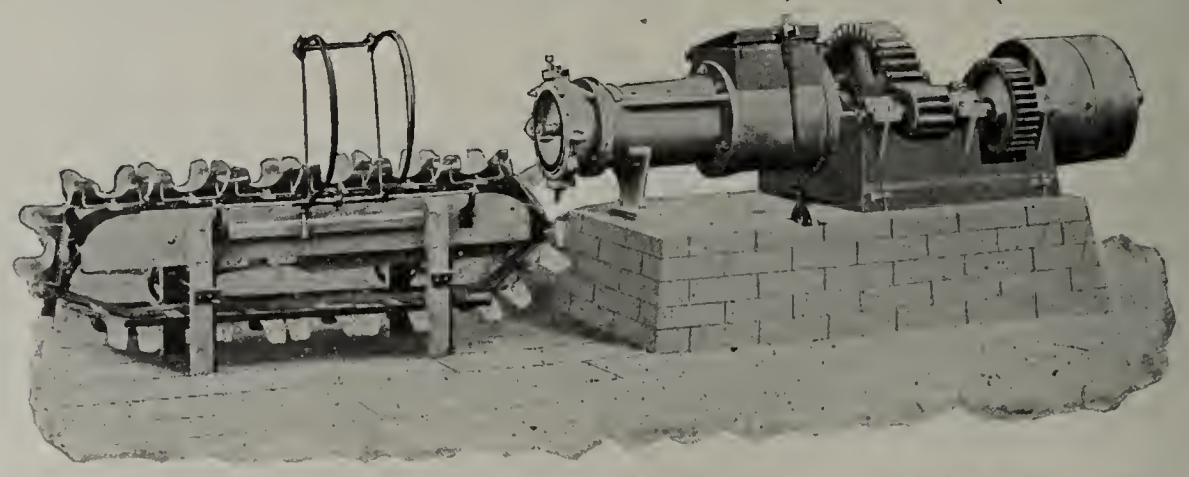


Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers . . . of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . .
Send for circulars and prices.

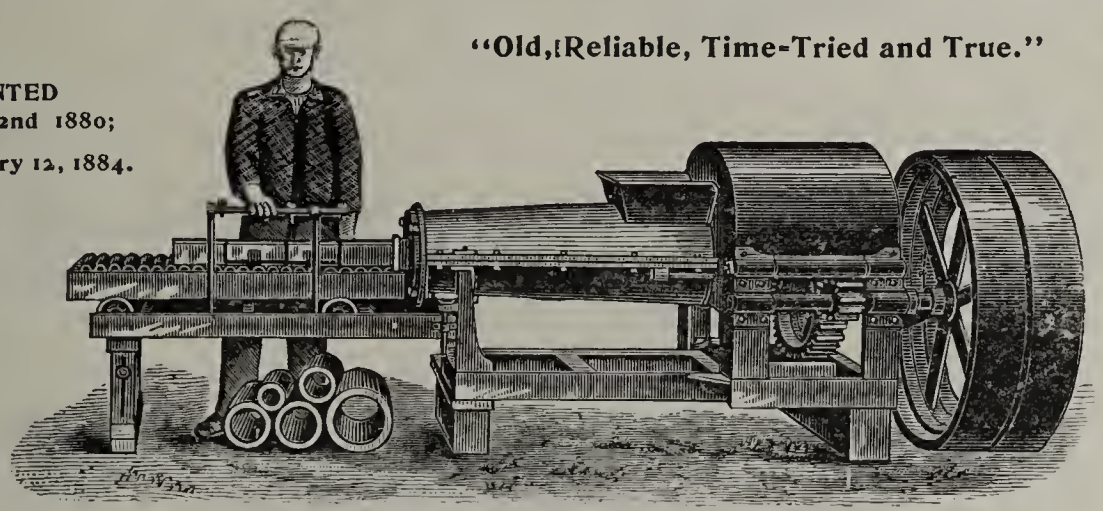
W. B. MERSHON & CO.,

Saginaw. East Side Mich.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS' FOUNDRY & MACHINE CO., Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

Davis's Brick, Tiles and Terra Cotta. Third Edition. Revised, Improved and Enlarged.

A Practical Treatise on the Manufacture of

Brick, Tiles and Terra-Cotta:

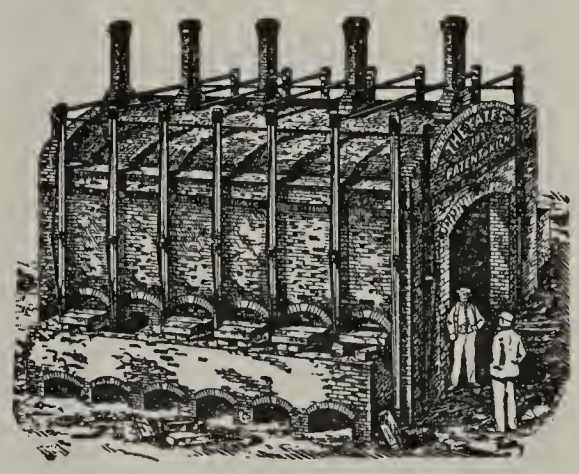
Including Stiff Clay, Dry Clay, Hand-made, Pressed or Front, and Roadway Paving Brick, Enameled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra Cotta, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics, and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace With a Detailed Description of the different clays employed, the most Modern Machinery, Tools and Kilns used, and the processes for Handling, Disintegrating, Tempering and Molding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition. Revised and in great part rewritten. Illustrated by 261 engravings. 662 pages, 8vo. Price, ...$5.00

☞*This volume will be sent by mail to any address in the world, or delivered by express C. O. D., freight paid, to any address in the United States for*.....$5.00

☞*A circular of eight pages with specimens of the illustrations, showing the full Table of Contents, will be sent free to any one furnishing his address.*

☞*Our New and Revised Catalogue of Practical and Scientific Books, 92 pages, 8vo, a New Catalogue of Books on Steam, the Steam Engine, etc., and our other Catalogues and Circulars, the whole covering every branch of Science applied to the Arts, sent free and free of postage to any one in any part of the world who will furnish us with his address.*

HENRY CAREY BAIRD & CO.,
Industrial Publishers, Booksellers and Importers,
810 Walnut St. PHILADELPHIA, PA., U. S. A.



Economy of Fuel and Large Percentage of Hard Burned Brick,

Is obtained by use of this kiln. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.
Hot air dryer. Continuous and Muffle Kiln.

ALFRED YATES,
JOHNSONBURG, PENN

Clay Workers

WILL SAVE MONEY BY CORRESPONDING WITH

W. R. Osborne,

Metuchen, N. J.

When in want of Second-hand

BOILERS, ENGINES, TANKS and PUMPS,

Of any Size or Design.

All machinery thoroughly overhauled and guarantee as represented.
Let me know your wants.

A Perfect Pen

AT A POPULAR PRICE, AND THE BEST PEN AT ANY PRICE

YOUR CHOICE OF THESE

$3.00

Laughlin Fountain Pens

FOR ONLY

$1.00

Try it a Week! If not suited, we buy it back and offer you $1.10 for it.

A Profitable Proposition any way you figure it. Don't miss this opportunity of a life time to secure the best pen made. Hard rubber reservoir holder in four simple parts. **Finest quality diamond point 14k gold pen, and the only positively perfect ink feeding device known to the science of fountain pen making.**

"A gift of never ending usefulness and a constant pleasant reminder of the giver."

Any desired flexibility in fine, medium or stub.

One Pen Only to One Address on this SPECIAL SEED-TIME SALE.

By mail, postpaid, upon receipt of $1. If you desire pen sent by registered mail send 10 cents additional.

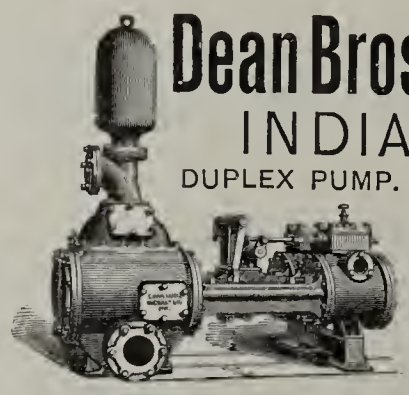
Ask your dealer to show you *this* pen. If he has not or won't get it for you, send his name and you order to us, and receive *free of charge* one of our Safety Pocket Pen Holders

Address

LAUGHLIN MFG. CO.,
Laughlin Block,
DETROIT, MICH.

Dean Bros.' Steam Pump Works

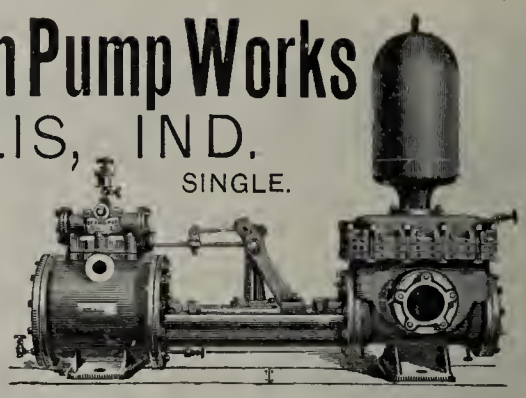
INDIANAPOLIS, IND.



DUPLEX PUMP.

PUMPING MACHINERY FOR ALL PURPOSES.

SEND FOR CATALOGUE AND PRICES.



SINGLE.

Drying Economy.

Our Dryer is superior to others by reason of improved methods, low cost of construction and economy of operation. If you're interested in dryers write for particulars. Ours will prove a good investment.

We also manufacture Conveyors, Exhausters, Heaters, Fans, Engines and Mechanical Draft Apparatus.

THE NEW YORK BLOWER CO.,
Bucyrus, Ohio.

NEW YORK OFFICE:
39-41 Cortlandt St., New York, N. Y.
BOSTON OFFICE:
185 Summer St., Boston, Mass.
CHICAGO OFFICE:
Merchants Loan and Trust Building.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.

Increases grinding capacity.

Gives a finer grade of clay

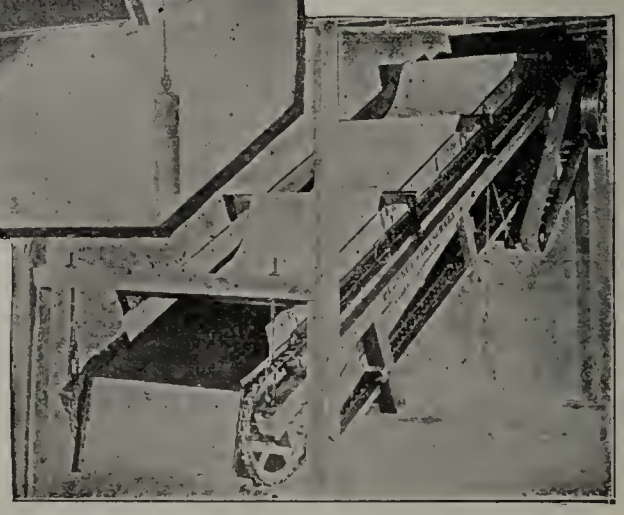
Does the work as well in cold weather as in warm.

Screens cold moist clay as well as dry.

It will more than save its cost in one Winter.

View on underside showing action of Rotary Brush.

HAS NO EQUAL.



Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels, Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., Western Ave, 17th-18th St. CHICAGO, ILL.

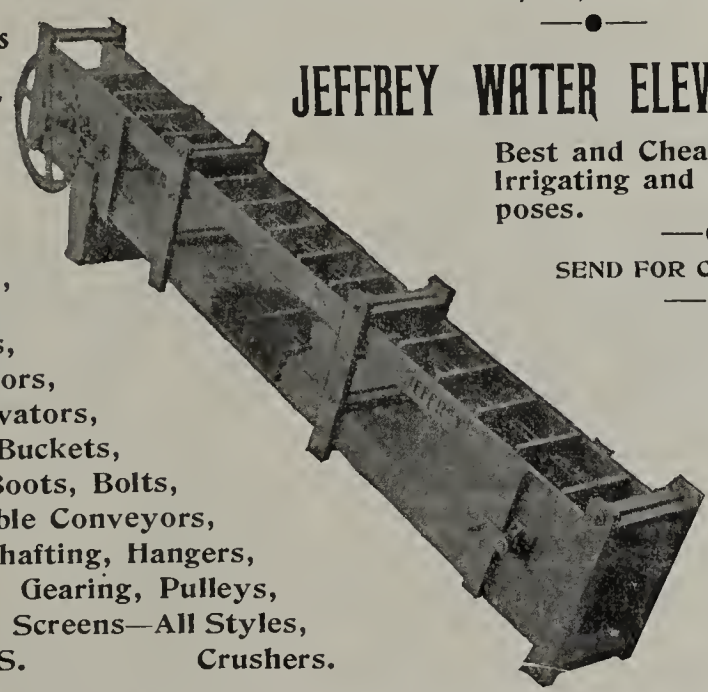
Our new Catalogue No. 25 (380 pages), will be sent upon application.

JEFFREY ELEVATING=CONVEYING MACHINERY.

Our Specialties include:

Chains, (All Styles,)
Sprocket Wheels,
Spiral Conveyors,
Rubber Belt Conveyors,
Tile Elevators,
Clay Elevators,
Elevator Buckets,
Boots, Bolts,
Cable Conveyors,
Shafting, Hangers,
Gearing, Pulleys,
Screens—All Styles,
Crushers.

LABOR SAVING APPLIANCES.



JEFFREY WATER ELEVATOR,

Best and Cheapest Pump for Irrigating and Drainage Purposes.

SEND FOR CATALOGUE.

Address . . .

The Jeffrey Mfg. Co.,
Columbus, O. U. S. A.

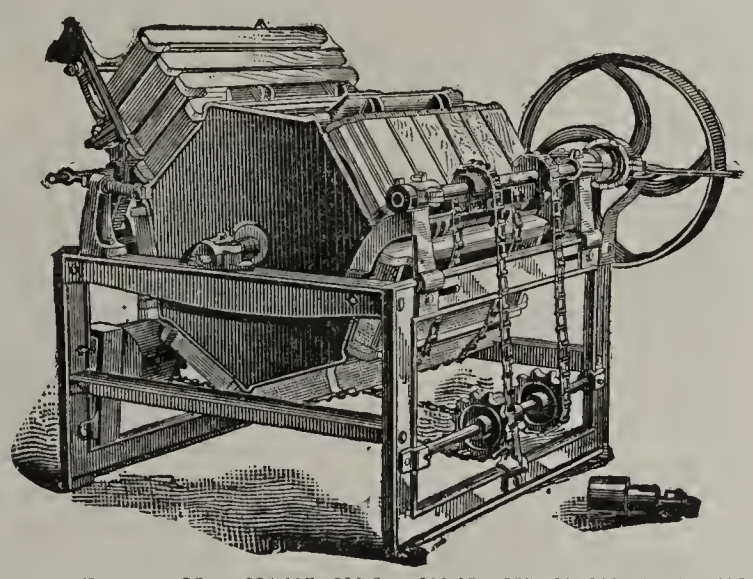
Branches:
NEW YORK.
DENVER.

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been successful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of WELLS & HALL, Successors to WESTBROOK & WELLS, Ogdensburg, N. Y.

VanDuzen's STEAM JET Pumps.

Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. **Carbonate of Barytes**

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

LE CHATELIER'S

PYROMETER

For measuring temperatures between 0 and 1600° Celsius, equal to 2920° Fahrenheit.

RECOMMENDED BY THE HIGHEST AUTHORITIES, and Successfully used in establishments for the manufacture of

BRICKS, TILE, TERRA COTTA, STONE WARE, PORCELAIN, IN POTTERIES AND ALL CLAY WORKING INDUSTRIES, as well as

IRON AND STEEL AND ALL OTHER METALS,

Gas, Chamotte,
Glass, Chemicals,
Sugar, Cement,
Accumulators, Incandescent Lamps,
Cartridges and Ammunition.

Also by Boiler Inspectors, Schools and Colleges and for **Hardening and Annealing Steel in Roll Foundries, Etc.**

CONSTRUCTED BY
W. C. HERAEUS, Platinum Works,
Hanau, Germany.

Prices and Descriptive Pamphlet on Application.

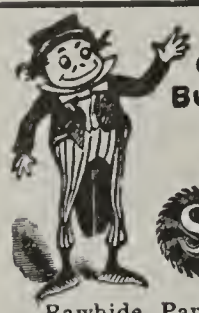
REPRESENTATIVE:
CHARLES ENGELHARD,
41 Cortlandt Street, New York, N. Y.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN, Ass't Gen'l Pass. Agent. CINCINNATI, OHIO

H. W. FULLER, Gen'l Pass, Agent, WASHINGTON, D. C.



It will also pay you to Get Our Prices Before Buying, RUBBER, CANVAS AND RED STITCHED BELTING

SAWS

Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gages, Brass Fittings. Hard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Wood Sawing Machines One Man Log Saws, Asphalt Felt Roofing. Endless Thresher Belts a specialty.

Warerooms opposite (south) Union Railway Passenger Station, in sight of all express offices and close to all freight depots. Quick shipments. ONE TRIAL will make you a regular customer.

Miller Oil & Supply Company,
INDIANAPOLIS, IND.

Pennsylvania Line,

—FOR—

Philadelphia, New York, Baltimore, Washington, Pittsburgh, Dayton, Columbus.

FOUR EAST TRAINS DAILY.
Leave Indianapolis, 3:35 a m, 8:25 a m, 3:05 p m, 5:00 p m, 7:10 p m.
Through Sleeping and Dining Car Service.

—FOR—

Chicago and Northwest,

TWO FAST TRAINS DAILY.
Leave Indianapolis, 11:35 a m, 12:20 p m.
Buffet Parlor Car on day train and local Sleeping Car on night train. Open every night at 8:30 for passengers.

CHANGE OF TIME, taking effect Sunday, Nov. 25th, 1900:

LOUISVILLE DIVISION:

Train No. 18 "Louisville Fast Line" leaves Indianapolis 3:55 p m; arrive Louisville, 7:10 pm.

I. & V. DIVISION.

Train No. 21 "Vincennes Accommodation" leaves Indianapolis 3:55 pm; arrive Vincennes, 8:00 pm.

Train No. 41, leaves Indianapolis 5:40 pm, and run to Martinsville only.

For tickets and sleeping car space call on agents, No. 48 West Washington street, Union Station or address

W. W. RICHARDSON, D. P. A.
E. A. FORD, G. P. A.

The VANDALIA LINE

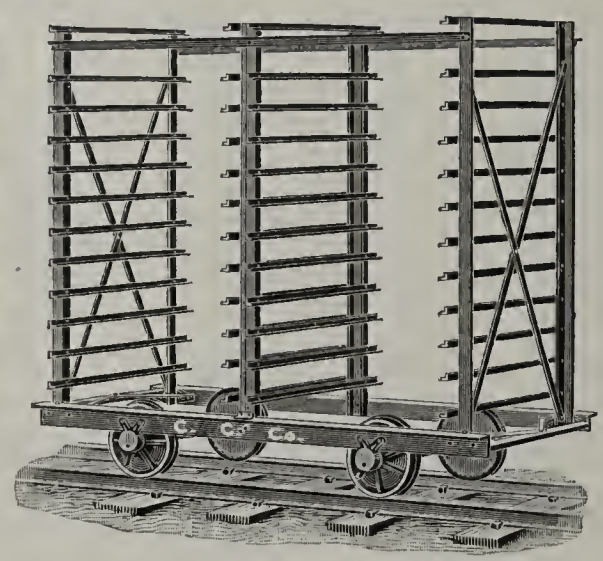
The Short Line for St Louis and the West.

	Leave Indianapolis.	Arrive at Terre Haute.	Arrive St. Louis
No. 15	7:25 am,	9:55 am	5:00 pm
No. 5	6:45 am	8:35 am	12:56 pm
No. 21	12:15 pm	2:05 pm	6:40 pm
No. 7	3:30 pm	5:10 pm	9:40 pm
No. 11	7:05 pm	9:00 pm	1:44 am
No. 19	11:20 pm	1:50 am	7:12 am

No. 3, Ex. Sun. 4:00 p m for Terre Haute.

DAILY.

No. 15, daily 7:25 a m for Terre Haute and St. Louis.
No. 3 Ex. Sunday 4:00 pm. for Terre Haute.
*Sunday only.
All trains carry first-class coaches.
12:15 Noon train has Dining Cars for St. Louis 11:20 pm. train has local sleeping cars starting from Indianapolis for St. Louis and Evansville open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.
Ticket offices, No. 48 West Washington St., and Union Station. W. W. RICHARDSON, District Passenger Agent, Indianapolis, Ind.
E. A. FORD, G. P. A.



No. 257 SOFT MUD RACK. Angle Frame.

OUR Specialty is the building of Dryer Cars. There are none better. Quality is our aim.

LIGHT,
RIGID,
SERVICEABL ,
STRONG,
DURABLE,
EASY RUNNING.

If interested write for particulars and information.

The CLEVELAND CAR CO.,
Cleveland, Ohio.

R·I·P·A·N·S

The following is a pretty strong assertion from a Philadelphia, Pa., resident, but being backed up by so many others of a like nature it can be easily believed: "I gradually lost my appetite, flesh, vitality, ambition. In short, I was dying by inches. I had one foot in the grave and one outside. I thank God I learned of R-I-P-A-N-S Tabules. They made me a hearty, healthy man, with renewed energy, vitality, strength, good memory and strong nerves."

WANTED:—A case of bad health that R·I·P·A·N·S will not benefit. They banish pain and prolong life. One gives relief. Note the word R·I·P·A·N·S on the package and accept no substitute. R·I·P·A·N·S, 10 for 5 cents, may be had at any drug store. Ten samples and one thousand testimonials will be mailed to any address for 5 cents, forwarded to the Ripans Chemical Co., No. 10 Spruce St., New York.

PATENTS GUARANTEED

Our fee returned if we fail. Any one sending sketch and description of any invention will promptly receive our opinion free concerning the patentability of same. "How to obtain a patent" sent upon request. Patents secured through us advertised for sale at our expense.

Patents taken out through us receive *special notice*, without charge, in THE PATENT RECORD, an illustrated and widely circulated journal, consulted by Manufacturers and Investors.

Send for sample copy **FREE.** Address,

VICTOR J. EVANS & CO.,
(*Patent Attorneys,*)
Evans Building, - WASHINGTON, D. C.

The Best Brick Drier

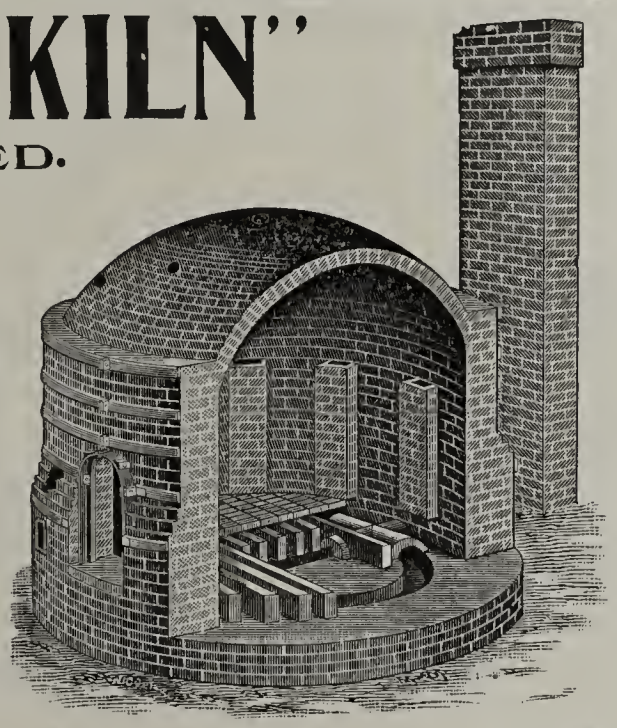
Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. **Phillip's Inside Fan Heater and Dryer,** proves to also be a "Condenser."

If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS. Agent and Patentee, **161 Grand Street, Rahway, N. J.**

The "PIKE KILN"

IMPROVED.



Clayworkers:—

Do not experiment, but take the old reliable, that has long since established itself as doing honest work. It will burn anything from vitrified pavers, to the finest pottery ware, uniformly, and economically. More than 1,200 in use, in three countries.

Reward For Information of Infringements.

Ask for testimonials, and address the patentee,

E. M. PIKE,
Chenoa, Ill.

The ALSIP DOWN DRAFT AND UP DRAFT Kilns and Kiln Appliances.

For **uniformity** in **burning, hardness** of **ware, economy** in **fuel** and **labor** and **final results** my Kilns stand without an equal.

The **Alsip Self-Cleaning Gradual Feed Furnace Grate** burns the **Cheapest Grades** of **Coal** equally as well as the best **Lump,** and it **positively** produces **more heat** from a given quantity of coal with **Less Labor** than any other Furnace or Furnace Appliances in the market.

If the Kilns you now have are not giving satisfaction, or intend to build new ones, the advantages and results of my system will be given by addressing

S. H. ALSIP, Brick Manufacturing Expert. **Belleville, Ill.**

50 YEARS' EXPERIENCE

PATENTS

TRADE MARKS
DESIGNS
COPYRIGHTS &C.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. Handbook on Patents sent free. Oldest agency for securing patents.

Patents taken through Munn & Co. receive *special notice*, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms, $3 a year; four months, $1. Sold by all newsdealers.

MUNN & Co. 361 Broadway, **New York**
Branch Office, 625 F St., Washington, D. C.

Indiana, Decatur & Western RAILWAY.

Short line between **INDIANAPOLIS** and **KANSAS CITY.** The **only line** running **Reclining Chair and Sleeping Cars** between **CINCINNATI** and **INDIANAPOLIS, DECATUR, SPRINGFIELD, JACKSONVILLE, HANNIBAL** and **QUINCY.**

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	4.05 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
Chicago Fast Line	2.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.
Indianapolis, Ind.

LAKE ERIE & WESTERN RAILROAD. NATURAL GAS ROUTE.

Solid Train Between
Sandusky and Peoria
—AND—
INDIANAPOLIS and MICHIGAN CITY,
FT. WAYNE and CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

	Depart.	Arrive.
Toledo, Chicago and Michigan, ex	†7:00 am	*10:25 am
Toledo, Detroit and Chicago lim	*12:20 pm	†4:15 pm
Muncie, Lafayette and Laporte, spec	†7:20 pm	†10:25 pm

*Daily. †Ex-Sunday.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent, Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.,
INDIANAPOLIS, IND.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.
Correspondence solicited.

Office and Works: Clinton, Ind.

R. D. CULVER, Pres. and Gen'l Man. I. G. POSTON, Sec'y and Treas.

The Wabash Clay Co.,

MANUFACTURERS OF ALL SHALE

PAVING **BRICKS** AND BLOCKS.

Our leading brands are POSTON BLOCK, WABASH STANDARDS, "SPECIALS," for crossings on macadam streets, GUTTER BLOCKS and COLUMBIAN SIDEWALK BRICK.

Our material has for years successfully stood the heaviest traffic of Indianapolis, Terre Haute, East St. Louis and dozens of other large cities of Indiana and Illinois. We ask investigation and comparison by those seeking the best paving material. Samples furnished on application.

Office and Works at VEEDERSBURG, IND.

Preston Brick Co.,

MANUFACTURERS OF

Vitrified Shale Paving Brick,

SEWER AND HARD BUILDING BRICK.

Hornellsville, N. Y.

T. B. McAVOY. PRESIDENT. FRANK B. McAVOY, SEC. AND TREAS.

McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA. WORKS:—PERKIOMEN JUNCTION, PENN.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The HARPER-NORTON SHALE BRICK CO.,

Conneaut, Ohio,

MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

We make a specialty of our "Impervious" brick for residences, public buildings, etc., a vitrified, rough faced, glazed brick in a variety of shades.
Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING.

SYRACUSE, N. Y.

W. C. SIBLEY, PRES. J. W. SIBLEY, GEN'L. MAN.

THE COALDALE PAVING BRICK CO.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

COALDALE VITRIFIED PAVERS,
Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT, COALDALE, ALA.
TELEGRAPH OFFICE, WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

The Eastern Paving Brick Co.,

MANUFACTURERS OF THE HIGHEST GRADE

VITRIFIED PAVING BRICK and BLOCK,

For Streets and Sidewalks. Positive guarantee as to wearing qualities. Largest capacity in the East.
Correspondence solicited.

Office and Works, CATSKILL, N. Y.

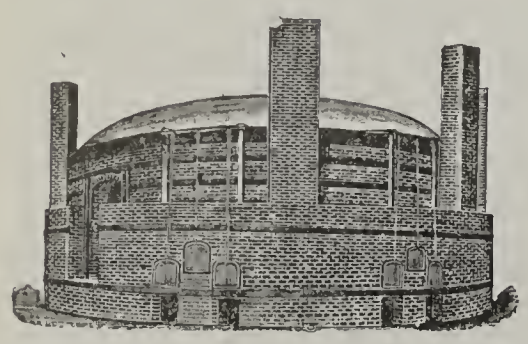
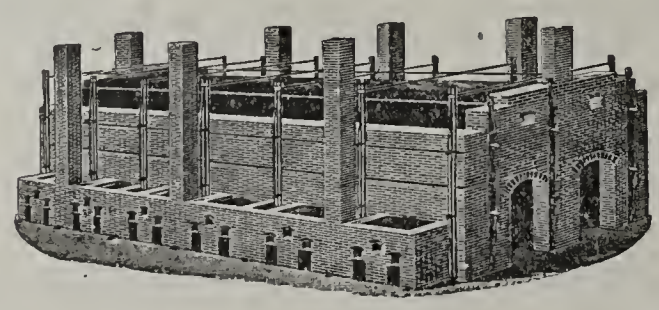
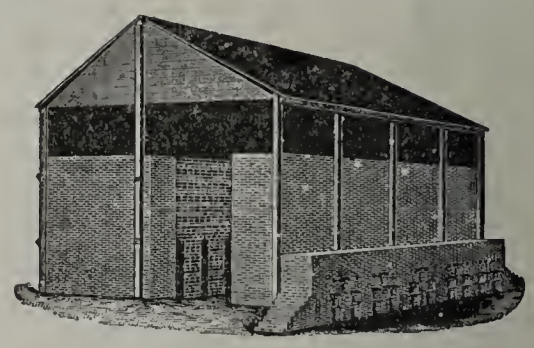
Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date.
By H. A. Wheeler, E. M.
Mailed to any address on receipt of $1.00.

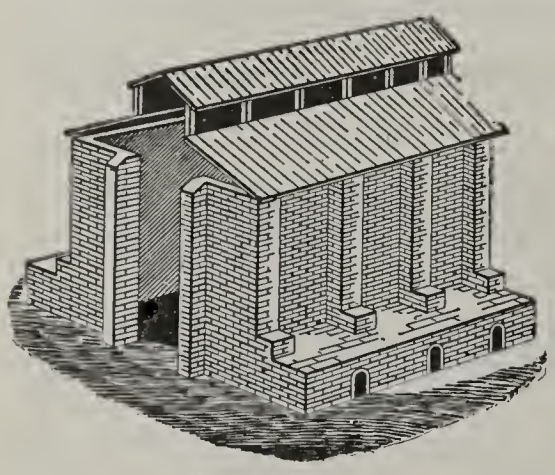
T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The Swift Slack Coal Coking Table Furnace Kiln,

Now in reach of all, both great and small.

$25.00 Will give you a chance to investigate the merits of the famous **Swifts Furnaces** and kilns. Write for particulars. **F. E. SWIFT, Washington, Iowa, U. S. A.**

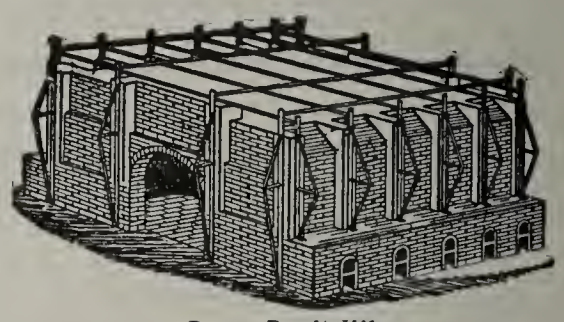


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, **2,422 Chestnut St.,** ***Kansas City, Mo.***

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

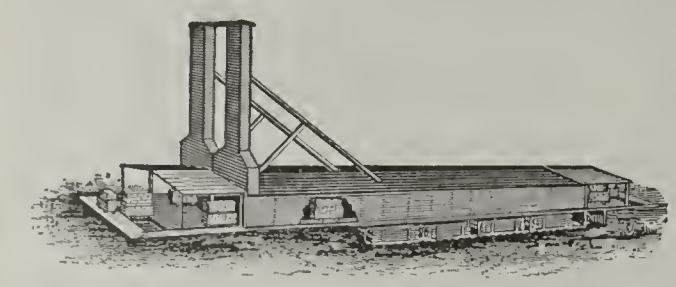
Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

A. F. BARRON,

Patentee and Builder of the

CHICAGO IRON CLAD and BARRON'S TENDER CLAY DRYERS.

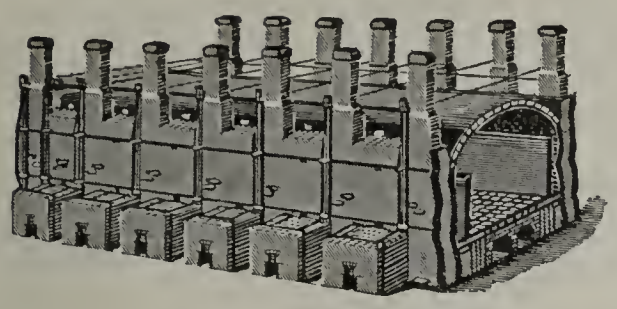


These are the gradual outgrowth of a correct principle patented 28 years ago. Every year since that date has witnessed improvements that has kept this system beyond the reach of competition and we now can build Dryers to dry clay products of every grade, even if the clay is of a tender nature. The original principle is still retained. Crude methods of application displaced by money saving devices in steam fitting and construction—enabling patrons to turn out clay products of highest grade in strength and color and at a great saving in expenditure of fuel. In seeking information mention the peculiar nature of the clay, process of manufacture, etc. Address,

A. F. BARRON,

Temple Court Building. **CHICAGO, ILL.**

The Bushong Down Draft Kiln.



PATENTED JUNE 1896.

Streator, Ill., October 3, 1900.
M. M. BUSHONG, Esq.,
Phoenixville, Pa.

Dear Sir:—Answering yours of September the 27th, we have been using one of the Bushong Down Draft Kilns the past fifteen months and are well pleased with it. We get a larger percentage of No. 1 pavers with a little less fuel than any other kiln on the yard.

Yours truly,
THE BARR CLAY CO.,
Per C. C. Barr, Treas.

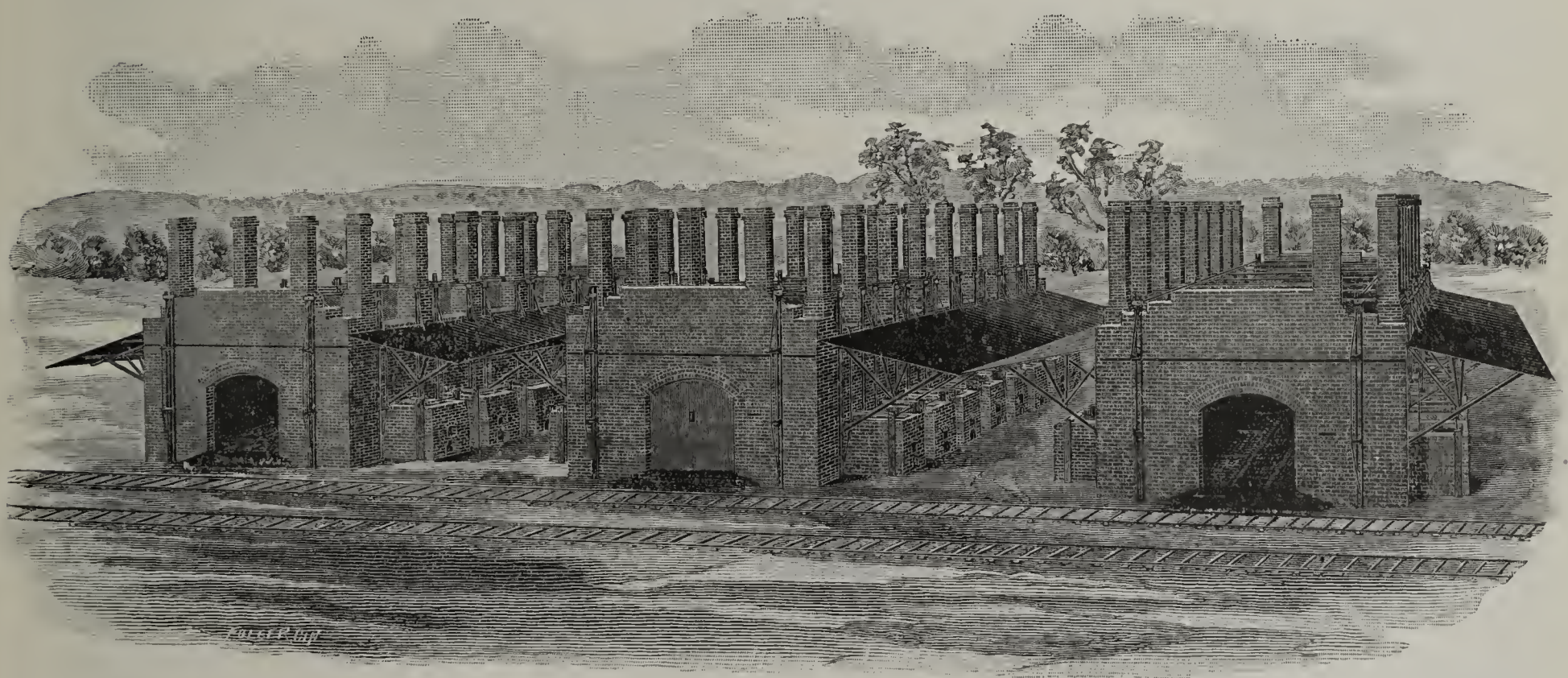
BURNS any kind of fuel.
USES less fuel than any other Kiln.
RESULTS are uniform.
NO damaged wares.
SAVES time and labor.

USED by some of the largest plants.
NO experiment.
IT'S success has been proven.
FULL control of drafts.
ONLY Kiln built that has Double Draft.
REDUCES burning time 24 to 48 hours.
MOST economical in construction.

M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.



These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

JUST OUT.

SECOND EDITION OF

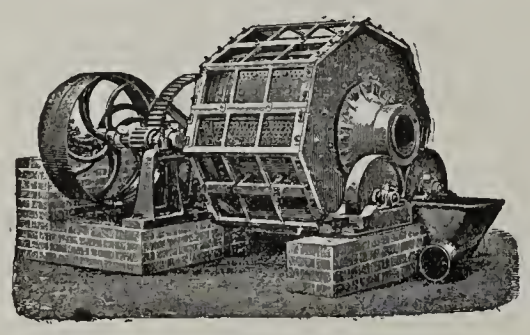
Tables of Analyses of Clays

By ALFRED CROSSLEY.

This valuable book has been carefully revised and enlarged to twice the size of the original edition. Among a large number of new analyses is included the leading PAVING BRICK CLAYS AND SHALES of America. For purposes of comparison this work is invaluable, and should find a place in the library of every clayworker. It is handsomely bound in Morocco and will be mailed postage prepaid to any address on receipt of price, $1.00.

T. A. RANDALL & CO., Publishers, Indianapolis, Ind.

The SMIDTH BALLMILL.



Simplest ✲ Best ✲ Most Efficient.

CRUSHES, GRINDS and SIFTS in one Operation, Working Continuously.
Excells all others in Absolute Uniformity of Product.
Maximum Output. Slight Cost of Repairs. Low Horse Power.
SEND FOR CATALOGS.

F. L. SMIDTH & CO., Engineers,
66 Maiden Lane, N. Y.

COPENHAGEN: Vestergade 29, K.

LONDON: 9 Bridge St., S. W.

Office of T. W. CARMICHAEL,

Wellsburg, West Va., November 15, 1900.

Messrs Brickmaker, The World Over:

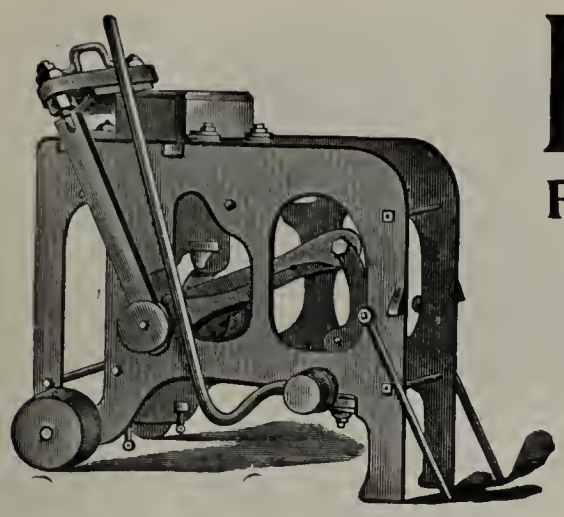
Gentlemen—The Carmichael Clay Screen has eight (8) screening surfaces, each having fifty (50) square feet of actual screening surface. making four hundred (400) square feet in all, and has a simple device for scattering the clay over this vast surface.

Write me stating what process you use and I will send you a sketch drawn to a large scale, showing the Carmichael Screen with your machinery. Compare 400 square feet with the actual screening surface of the screen you are now using or of any screen on the market.

The Carmichael Screen is a Gravity Screen accessible from the floor level. There is no shake, no jar, and no per ''cussing.'"

T. W. CARMICHAEL,
Wellsburg, West Va., U. S. A.

Mention The CLAY-WORKER,
When writing to Advertisers,
Mention The CLAY-WORKER.



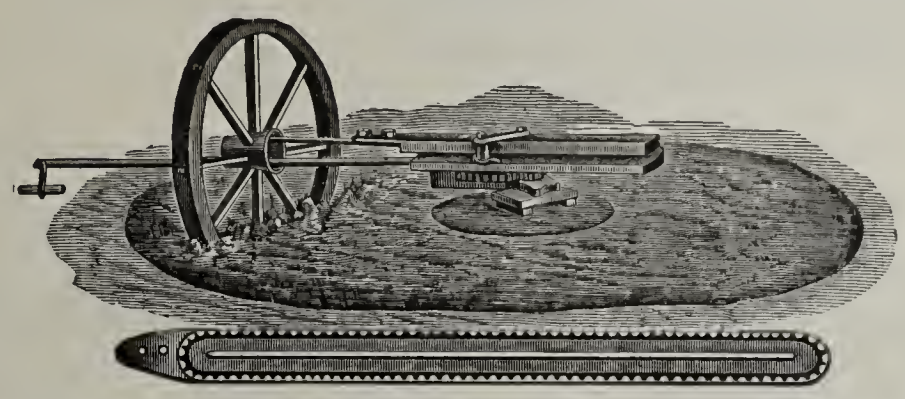
RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,

PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

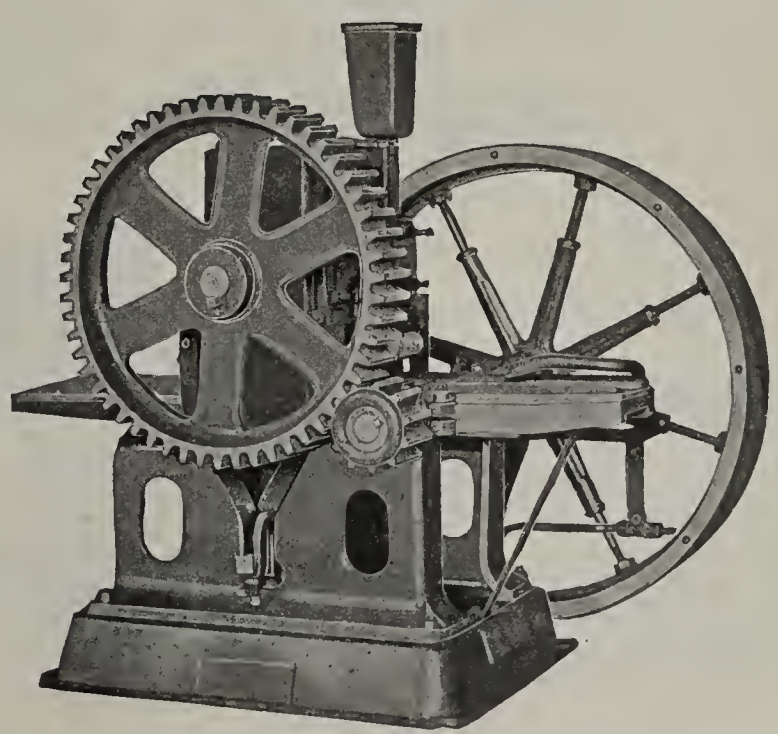
Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.

The "New South" Brickmaking Machinery.

WE manufacture a full line of Brick and Tilemaking Machinery, and are prepared to equip plants for making from 7,000 to 50,000 brick per day. Can furnish almost any machinery needed on a modern brickyard. Your special attention is called to our POWER REPRESS. Write for Catalogue. Correspondence our delight.



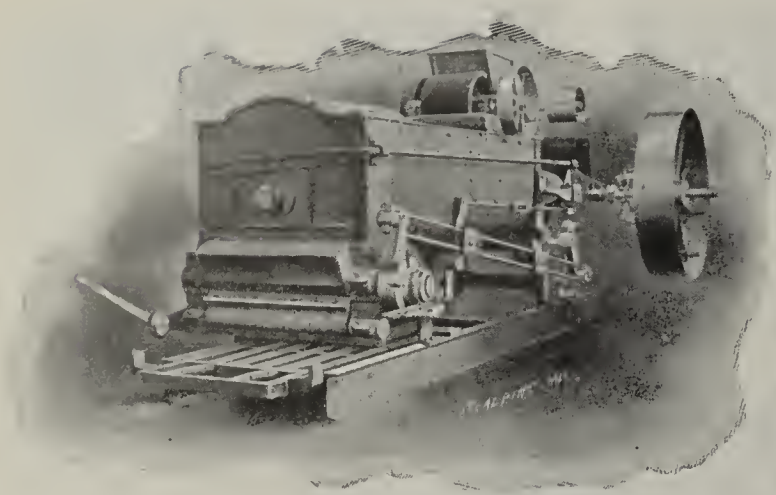
Williamsport, Md., Nov. 27th, 1900.

MESSRS. J. C. STEELE & SONS, Statesville, N. C.

Gentlemen:—Your power represses which we purchased from you last year and summer for our Conococheague Brick and Earthenware Co. here have fully proven by trial and use since, very satisfactory. With raw bricks of proper size for dies, and condition for repressing, good solid bricks are made equal to hand pressed in beauty, and more solid. We repress 9 M per day of 10 hours, on each machine. Of the several represses that we have tried yours is the best.

Yours very truly, VICTOR CUSHWA & SONS.

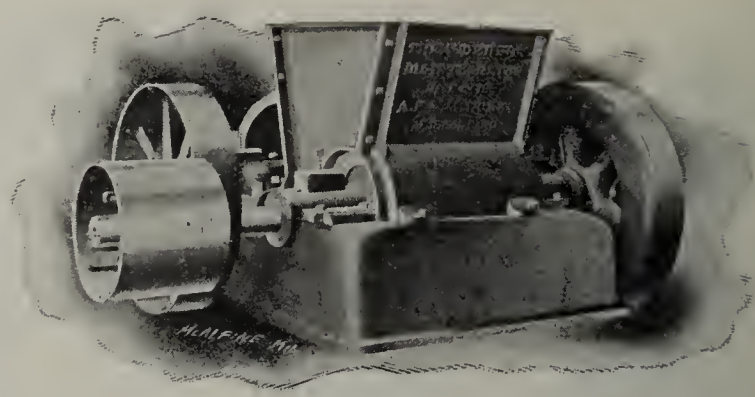
J. C. STEELE & SONS, Statesville, N. C.



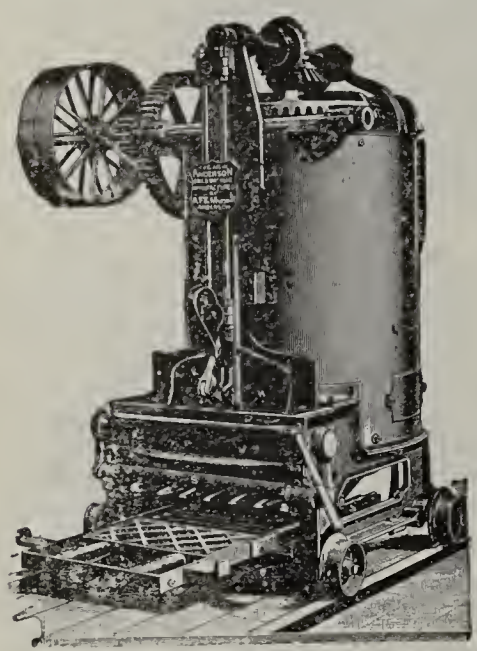
Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save you money.



Best Disintegrator on the Market.



Steel and Iron Upright Stock Brick Machine.

MANUFACTURERS OF . . .

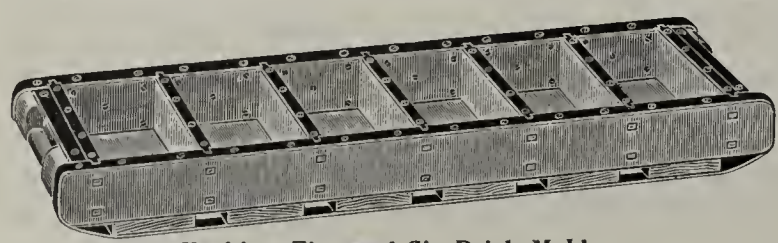
New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Molds, Trucks and Barrows,
And all Brickyard Supplies.

1899 Horse Power Machine.

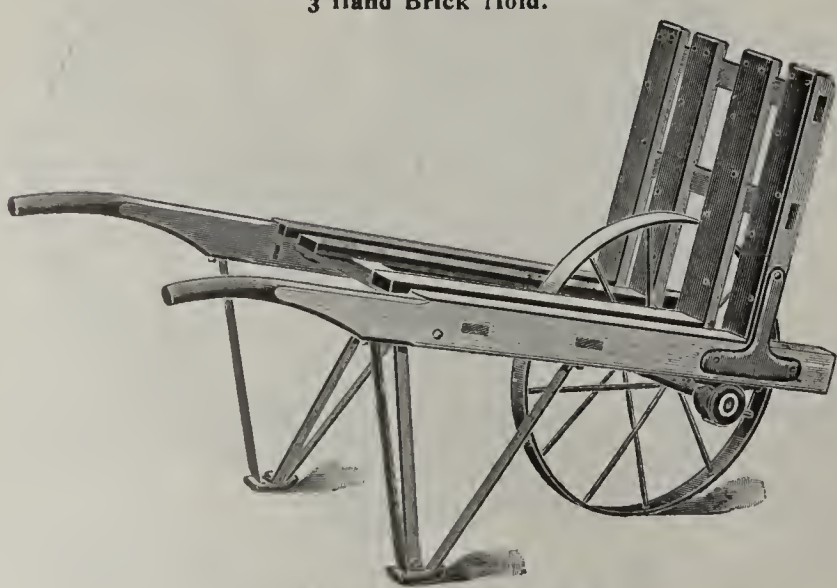
The Anderson Foundry and Machine Works,
Anderson, Ind.



Machine, Five and Six Brick Mold.

6 Brick Hand Mold

3 Hand Brick Mold.



IRON-CLAD BRICK BARROW.

BRICKYARD SUPPLIES,

FOR 1900.

If you want the best there is in the market, the place to get them is at ARNOLD'S. They have the facilities for making them.

MACHINE MOULDS, SPECIAL GRADE, for moulding stiff mud brick for durability they are unexcelled.

MACHINE MOULDS, ORDINARY GRADE, for ordinary brick, moderate price. They make all the various shapes of machine moulds. CIRCLE, SIDE and END wedge. Moulds lined full depth or three-quarters of an inch down at ends of brick. Panel bottoms, brands, etc.

HAND MOULDS. One, Two, Three, Four and Six Brick.

STEEL MOULDS. One, Two and Three Brick.

BRICK BARROWS AND TRUCKS in great variety. Iron-clad brick barrows (with Roller Bearings when desired.) The Strongest and Easiest Running Barrow in the market.

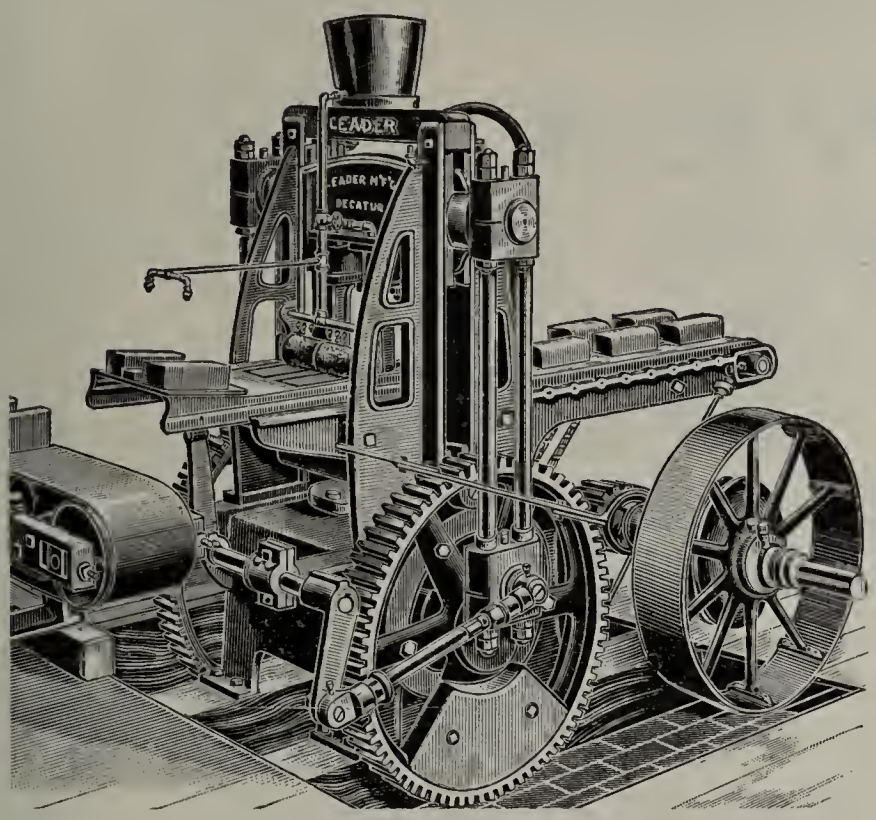
SPECIAL BARROWS AND TRUCKS made to order from your own designs at very reasonable prices. If you are not familiar with these goods send a sample order and be convinced.

Address,

D. J. C. ARNOLD,

New London, O.

WELL PLEASED WITH THE RESULT.



Leader Brick Repress.

GEO. W. BATES, President. SIDNEY SMITH, Secretary.
F. S. AKIN, Vice-President. A. P. TIFFT, Treasurer.
HARRY HOWARD, Manager.

Diamond Vitrified Brick Company,

INCORPORATED.

PAVING BRICK A SPECIALTY.

613 Chamber of Commerce.

Portland, Oregon, November 12th, 1900.

LEADER MANUFACTURING CO.,
Decatur, Illinois.

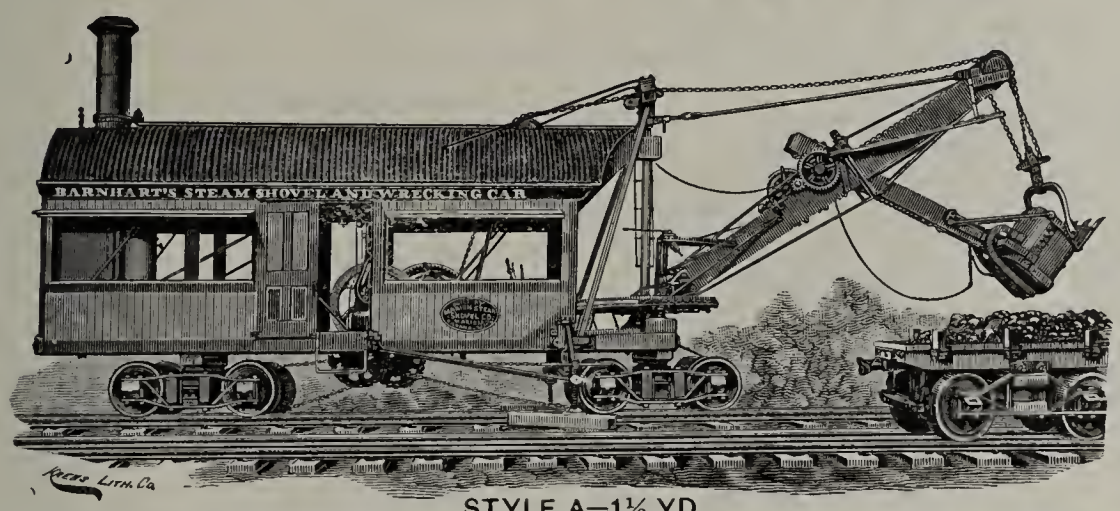
Gentlemen:—The machinery we bought of you, consisting of a No. 9 Pug Mill, "B" Crusher, Automatic Cut-off and a Double Die Repress, have all DONE ALL YOU PROMISED, and WE ARE WELL PLEASED WITH THE RESULT.

Yours very truly,
DIAMOND VITRIFIED BRICK CO.

Let us send you our printed matter showing all of this machinery.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

How Much Could You SAVE BY USING A Crown Dryer.

THE WARREN BRICK AND TILE COMPANY.

MANUFACTURERS OF

BUILDING BRICK AND DRAIN TILE.

WARREN, OHIO, November 7, 1900.

THE CROWN DRYER CO., Cleveland, Ohio.

GENTLEMEN: On September 12th we made a test for fuel consumption on the Dryer which you installed for us, showing the following results:

Fifty cars dried—448 Brick per car—22,400 Brick.

Green Brick weigh 8 lbs., Dry 6½ lbs.—1½ lbs. Water per Brick—33,600 lbs.

		Water.
Amount	Coal for 24 hours	1880 lbs.
"	Ash for 24 "	357 "
"	Combustible for 24 hours	1523 "
"	Water per pound Combustible	22.06 "
"	Water per " Coal	17.87 "
"	Combustible per Brick	68 "
"	Coal per Brick	84 "
Cost of	Coal per ton	$2.00
"	" " Thousand Brick	8.4 cents.

We enclose check in final payment for Dryer, and cheerfully recommend it as being, in our opinion, the best and most economical on the market.

We shall be pleased at any time to show it to interested parties and afford them every opportunity for investigation.

Yours very truly,

THE WARREN BRICK & TILE CO.

E. C. WOLCOTT, MGR.

The CROWN DRYER is not only the **Most Economical** on the market, but is **Reliable, Simple, Durable,** has nothing to get out of order or need repairs, is under the **Positive** and **Absolute Control** of the operator in all respects and is comparatively inexpensive to construct.

Write for information.

The CROWN DRYER CO.,

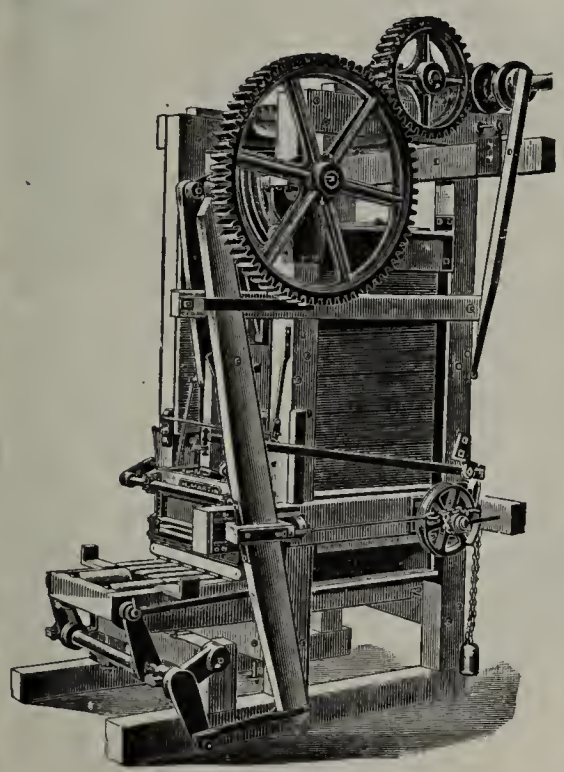
New England Building.
CLEVELAND, OHIO.

A Proposal

To Equip Your Plant with the Very Latest Improved and Best

BRICK MACHINERY

WILL BE CHEERFULLY SUBMITTED.



Style "A," Capacity 50,000.

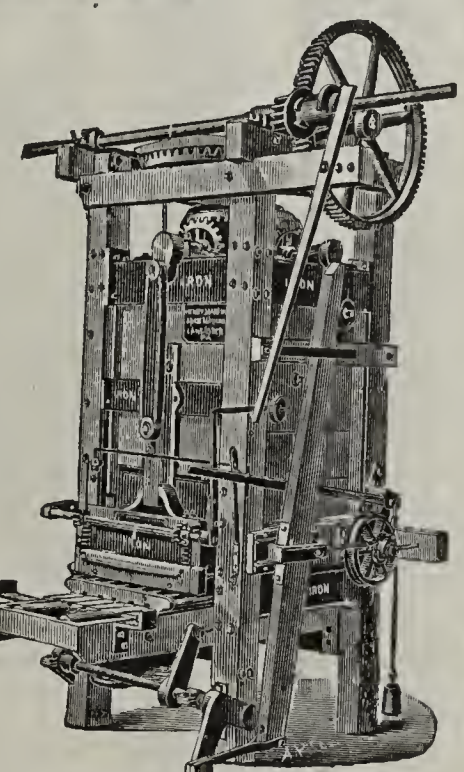
Soft Mud Machinery.

Dry Press or Wire-cut Outfits.

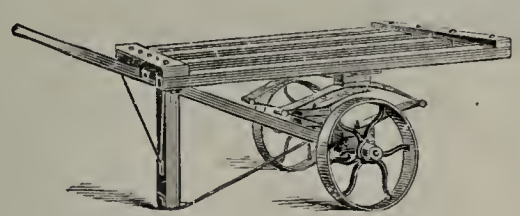
Dry Pans and Disintegrators.

Rock and Ore Crushers.

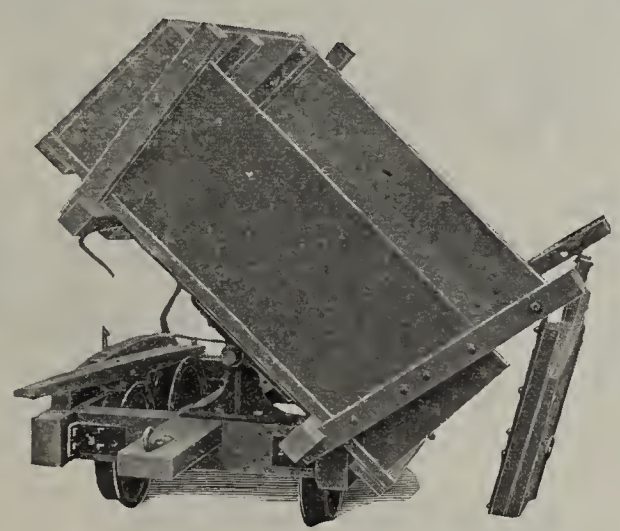
Hoisting Drums and Cable.



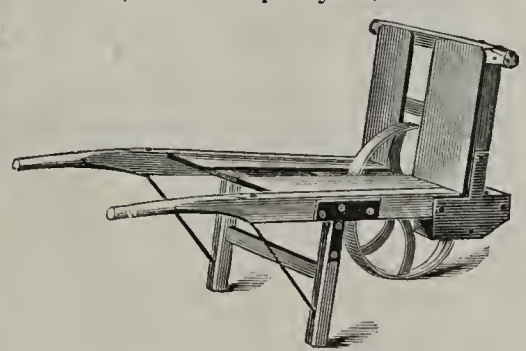
Style "B," Capacity 40,000.



TRUCKS, Etc., built to Your Order.



Side, End or Rotary Dump Cars.



BARROWS, White Oak, Expressly for Brickyard Use.

The Martin Steam Brick Dryer.

We Use No cars, no tunnels, no engines, no fans, no track, no direct hot air flues.

We Do Use The exhaust from your engine during the day and live steam only during the night.

YOUR BRICK DRIED INSIDE OF 24 HOURS.

The Latest Improved, Simplest, Cheapest and Best.

Send for our General Catalogue of EVERYTHING A BRICKMAKER NEEDS.

The Henry Martin Brick Machine Mfg. Co.,

LANCASTER, PA., U. S. A.

BUILT RIGHT RUNS RIGHT

THE MONARCH

KING OF THE WORLD

World Wide Winners.

AT ALL the International Expositions, medals have been awarded to the "**Built Right, Run Right**" line. Philadelphia Centennial; International Cotton Exposition, St-Louis; Mechanical Exposition, Louisville; Chicago; New South Wales; Pennsylvania State; New York; Indiana; Ohio and all other expositions of note where these machines have been exhibited they have been awarded prizes.

Why is it?

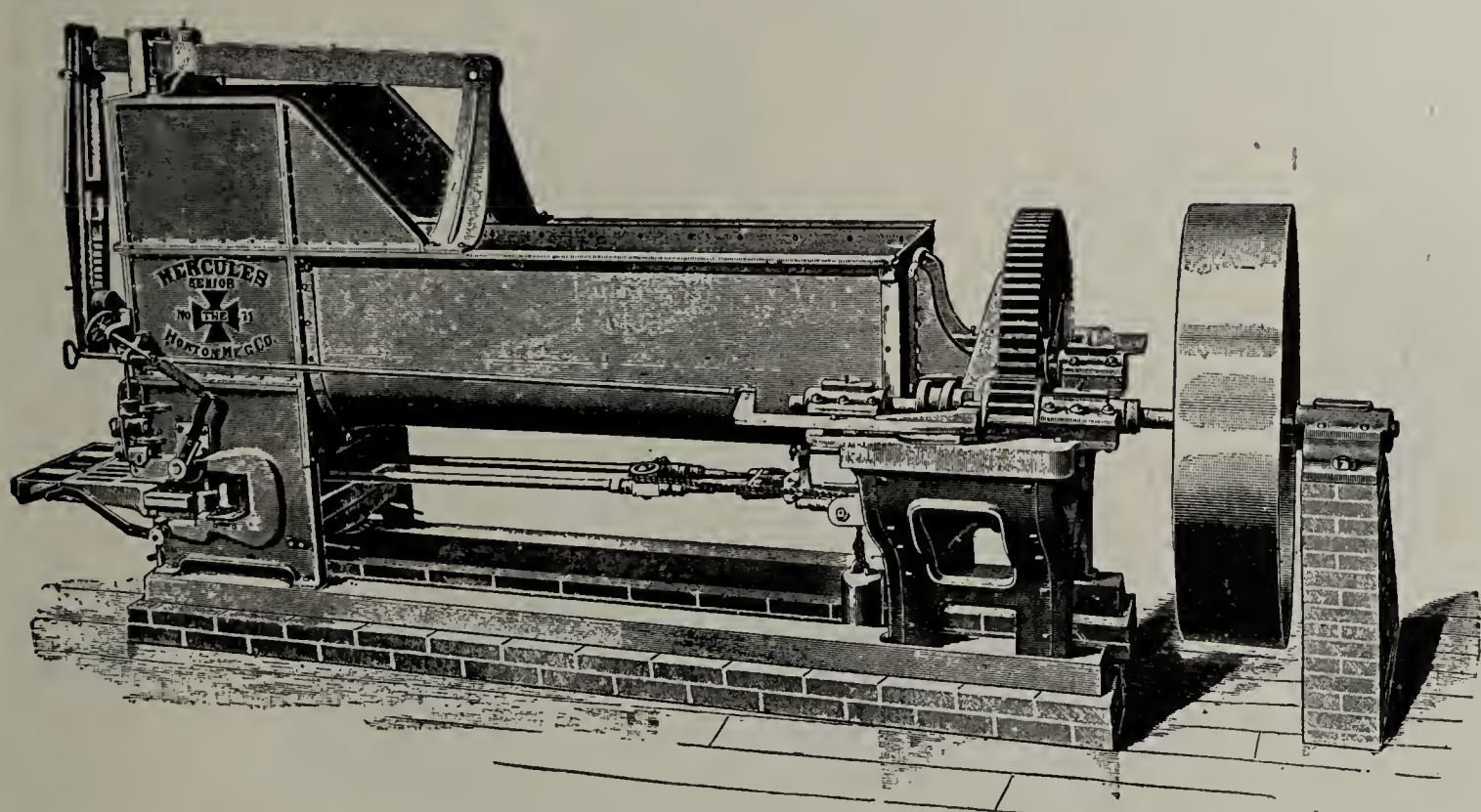
It's because merit wins and the judges sanction the verdict of the Clayworkers, all of whom pronounce these machines the best beyond comparison. They,re "**Built Right**" and "**Run Right.**" Your inquiries solicited. We build Dry Press, Stiff Mud, Soft Mud, Pottery and Cement Machinery.

The American Clay=Working Machinery Co.,
BUCYRUS, OHIO, U. S. A.
NEW YORK OFFICE:--39-41 Cortlandt St.

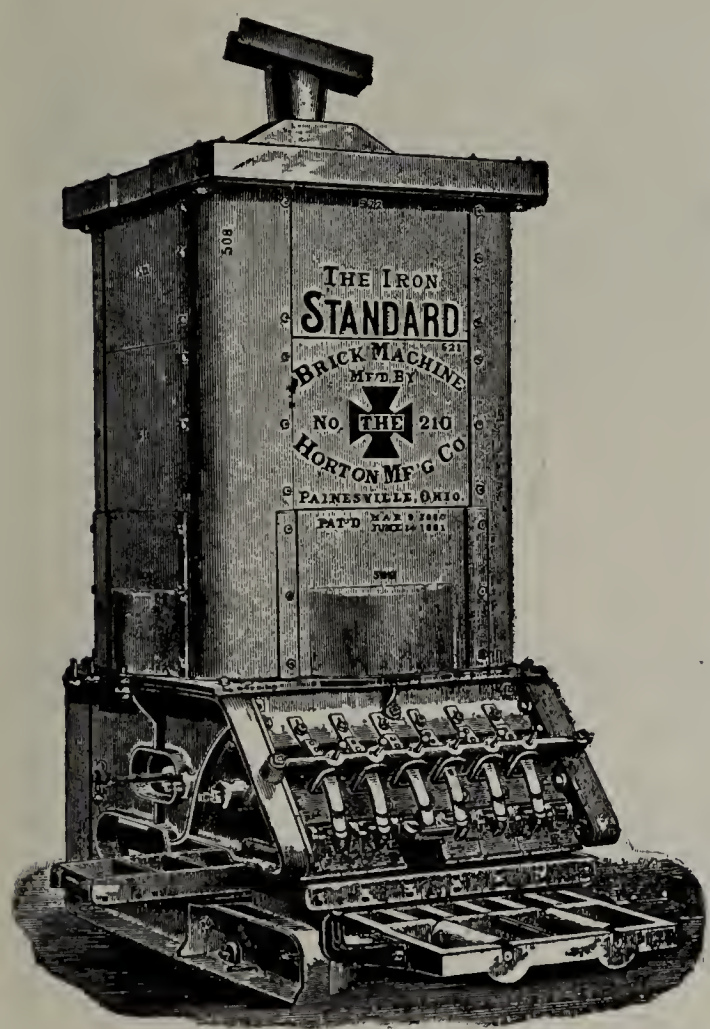
See Ads. on Pages 473 and 505.

Our Brick Machine Family.

THE BEST IN THE WORLD.



HERCULES



IRON STANDARD HORSE POWER.

We also manufacture PUG MILLS, FRICTION HOISTING DRUMS, CLAY ELEVATORS, DUMP CARS, TRUCKS, BARROWS, TEMPERING WHEELS and all Brickyard Supplies.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE, OHIO.

Standard Heavy Steam Power.

Write us for 1900 CATALOGUE C.

Now Will You Be ....Good....

NCE MORE the **Potts Patents** on **Clay Disintegrators** are delared to be good and valid. That all machines using adjustably secured or solid bars cast to the roll, are infringements of the Potts Patents.

It is now only a matter of a short time until all manufacturers of these infringing machines will be prohibited from manufacturing or selling the same.

Don't let this trouble you as **C. & A. Potts & Co.,** are still in the business, and will furnish all the Disintegrators wanted. You will never have to go back to the old and expensive rolls.

The manufacturers of these infringing Disintegrators have the past six years told you the Disintegrator was the machine for you to use, if this was the case then it must be so now.

Remember the Disintegrator is the only machine ever made that will work any kind of clay direct from the bank and not choke or clog—it will grind the small stones and separate the large ones, it does not pack the clay into thin hard sheets, but leaves it in a loose open condition, so it will take water quickly and is easily pugged. It saves labor and improves the quality of Brick or Tile.

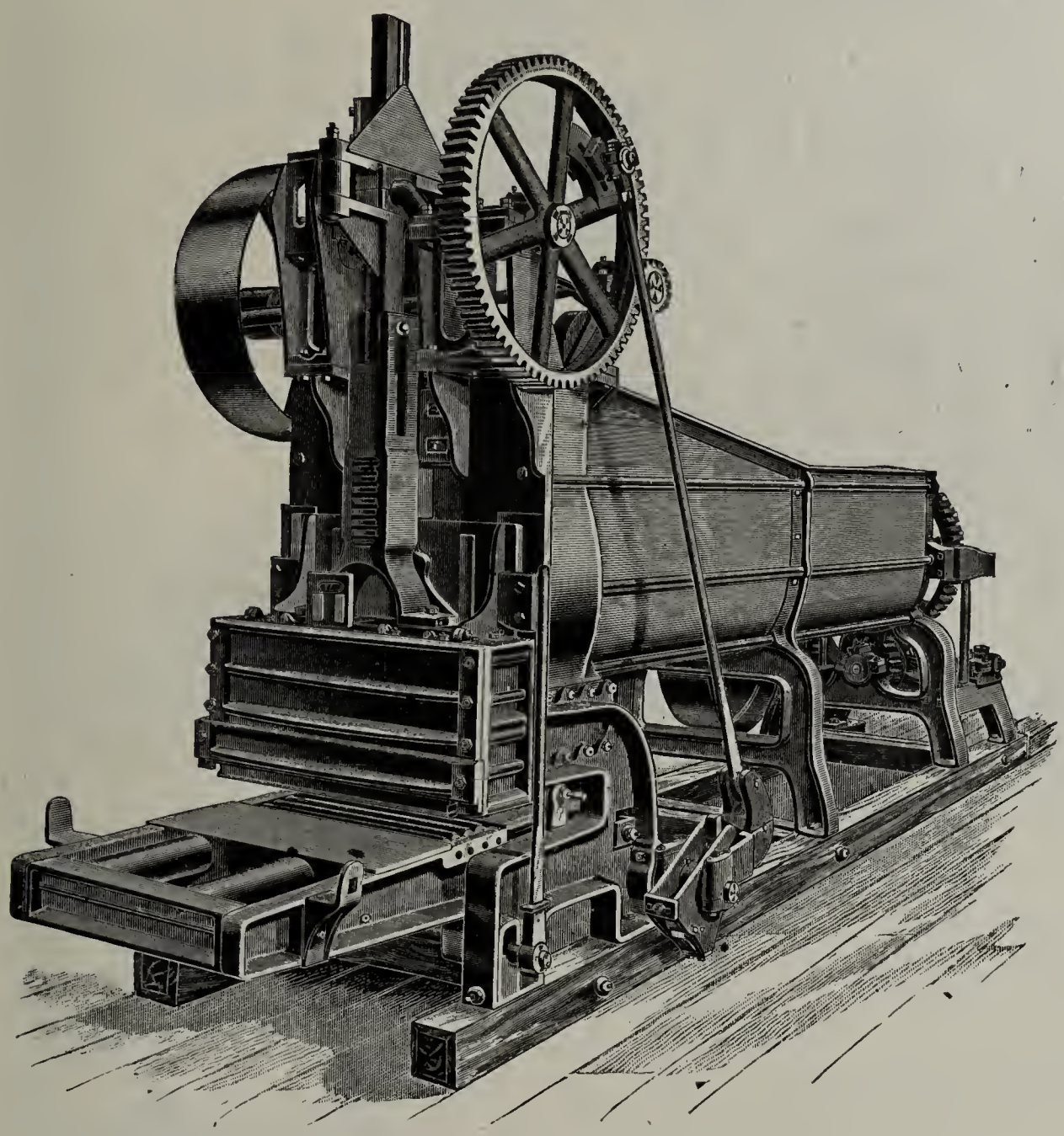
For prices write

C. & A. POTTS & CO.,
Indianapolis, Ind.

CHAMBERS BROS. CO., Philadelphia, Pa.,
Are the only Licensed Manufacturers.

We Think So Too.

Once use a **Potts Brick Machine** you will never use any other. Fair treatment and doing as we agree, always hold a customer.



WE MANUFACTURE

Brick Machines,
Disintegrators,
Mould Sanders,
Granulators,
Pug Mills,
Elevators,
Winding Drums,
Clays Cars,
Moulds,
Trucks and
Barrows.

SAVE Money by Purchasing from first hands.

The above is the kind of a machine Mr. Butterworth orders. It is the Best Built, Heaviest and Strongest Machine made.

Danville, Ill., Nov. 13th, 1900.

C. & A. POTTS & CO., Indianapolis, Ind.

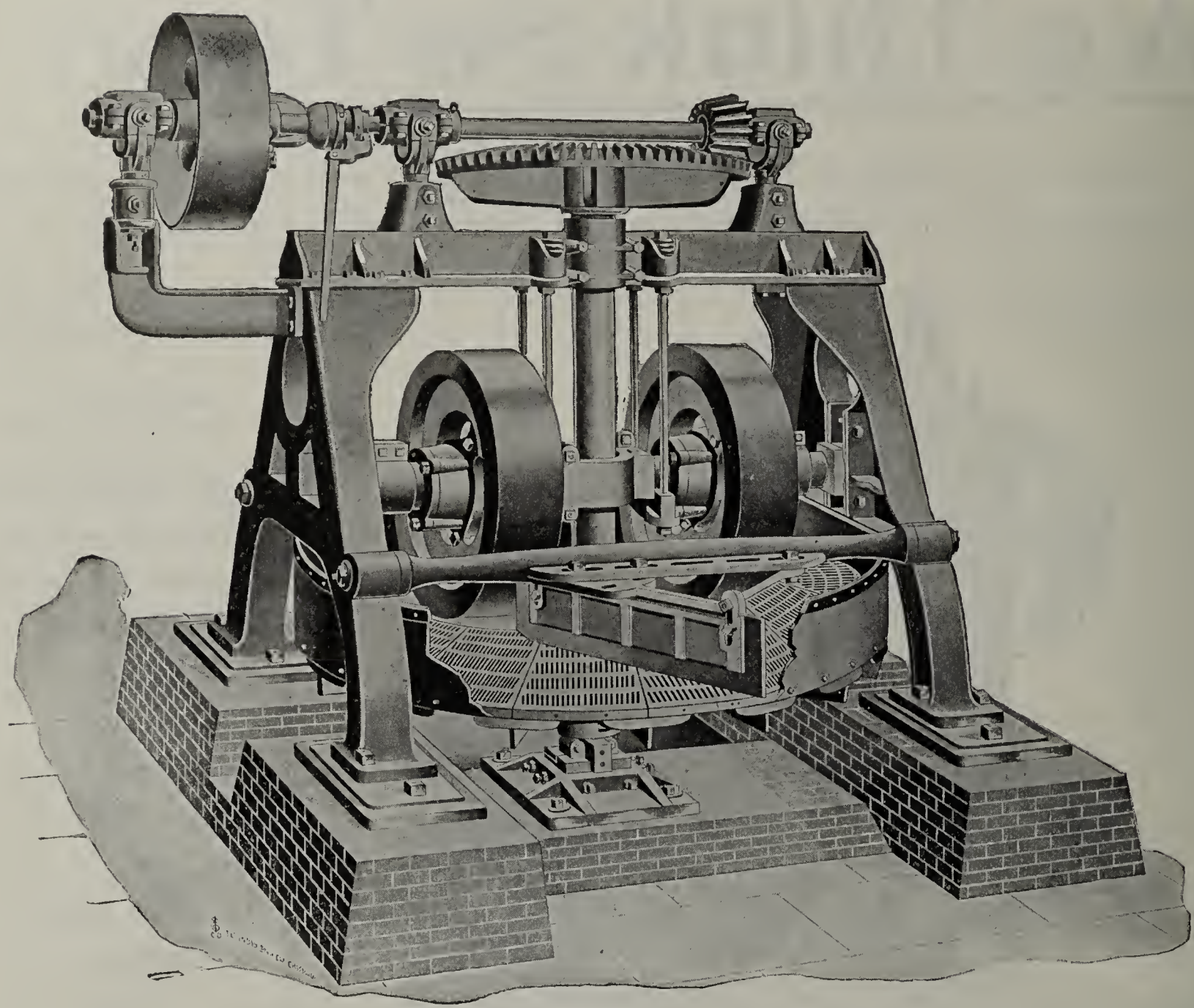
Gentlemen:—Please enter our order for one All Iron Horizontal Stock Brick machine, Mould Sander, Disintegrator and Revolving Dump Table.

This make the sixth Potts Machine used by Companies with which I have been connected, some of them have been in use continuously for nine years. The fact that I am equipping the soft mud end of the new works with another, is surely sufficient indorsement of the machines good qualities.

Yours truly, WESTERN BRICK CO.,
F. W. Butterworth.

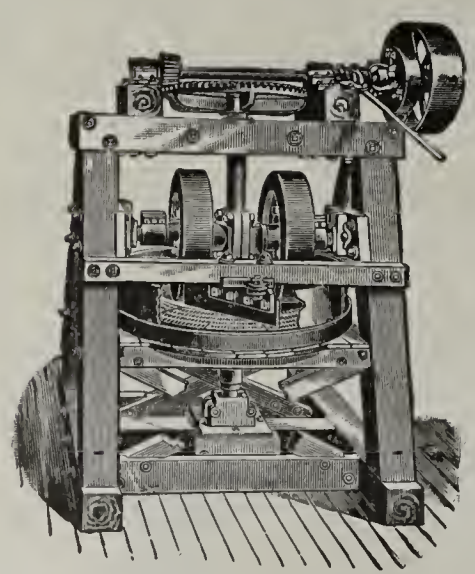
Write for Prices and Terms.

C. & A. POTTS & CO., = Indianapolis, Ind.



OUR SPECIALTY IS

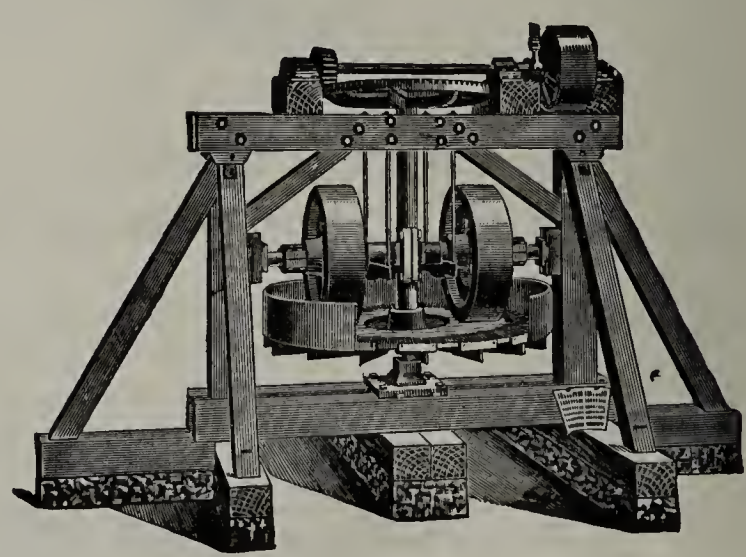
DRY PANS.



IRON FRAMES,

WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill., U. S. A.

Uncle Sam

AND

The Eagle Repress.

UNCLE SAM is proud of the record made by the **Eagle Repress** at the Paris Exposition, where it received a medal and the highest commendation. But Uncle Sam is prouder still of the record attained by the **Eagle** at home. In the United States it has for years been recognized as the peer of presses. It's not surprising that its fame should spread to lands beyond the sea.

There is only one secret of the **Eagle's** success and that is—**MERIT.** From top most tip to bottom most sill it's built to stand the most exacting tests. Flawless material, faultless workmanship and superiority of patents, places the **Eagle** in your plant equipped for any contest and equipped to win. If you want scrap iron buy it of your junk dealer. If you want the quality that will last and prove a valuable investment, your selection should be the **Eagle Repress.** Particulars for a postal. We build the best Dry Press, Stiff Mud, Soft Mud, Pottery and Cement Machinery.

Inquiry solicited. Satisfaction guaranteed.

The American Clay-Working Machinery Company,

BUCYRUS, OHIO, U. S. A.

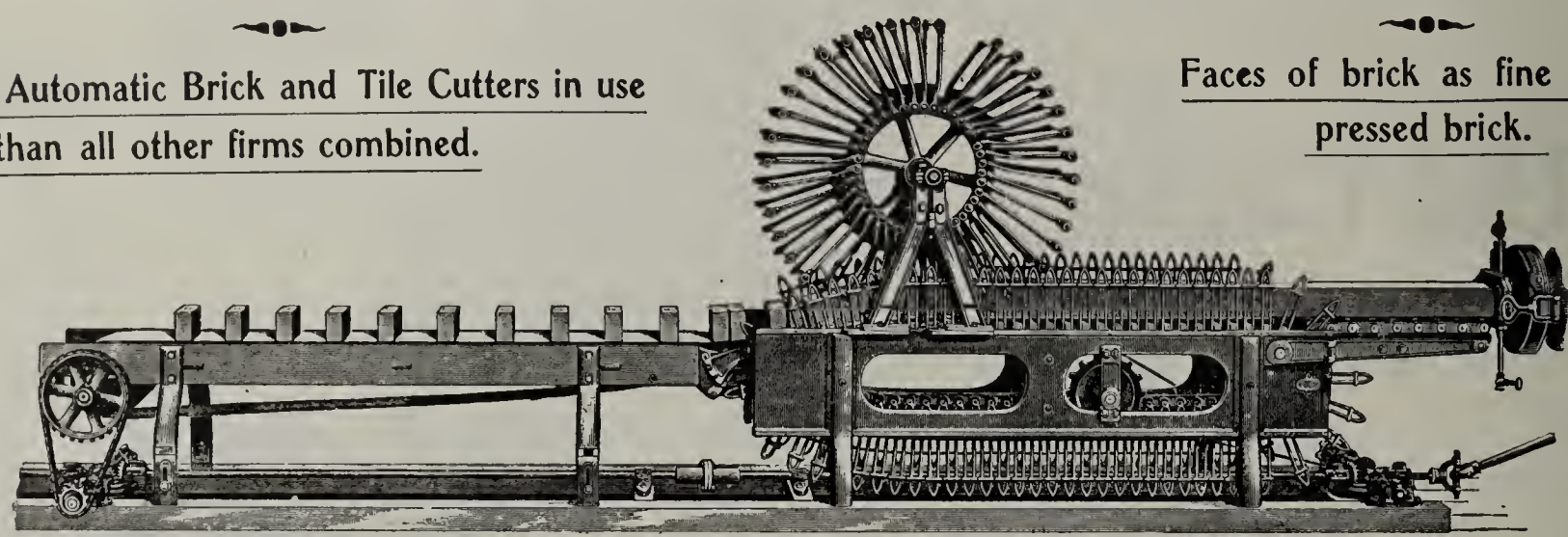
New York Office--39 and 41 Cortlandt Street.

PROGRESSIVE BRICK MAKERS

Are not easily deceived. They know the value of **points** like these—**Strength, Endurance, Reliability,** no "break-down," no "lay-off," but **every day** full capacity of **brick of guaranteed quality.**

More Automatic Brick and Tile Cutters in use than all other firms combined.

Faces of brick as fine as re-pressed brick.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Lancaster, Ohio, June 25th, 1900.

J. D. FATE & CO., Plymouth, Ohio.

Dear Sirs:—I presume you are wondering how we are coming on with Brick Table. Well, we are cutting brick all right. We had to reverse the motion to suit the mill, a thing I did not think of when ordering, aside from that we made no other change. We have made about 100,000 brick since setting up table, and are more than satisfied with it. If it continues to do good work as it does (and I feel sure it will) I would not part with it under any consideration if I could not get another.

Inclosed you will find my check for balance due you, and accept my thanks for your efforts in interesting me in the table. Respectfully, W. B. HENRY.

Montreal, Canada, May 3rd, 1900.

J. D. FATE & CO., Plymouth, Ohio.

Gentlemen:—The Automatic Side-cut Table we purchased from you has now been running three weeks and is giving the best of satisfaction, I had a little trouble the first few hours in getting it adjusted, as well as from everything being new and stiff. As soon as it got limbered up we had no trouble. It does not take one tenth the oil our old table used. We have not yet tried the belt for large sized brick; however, I do not anticipate any trouble from that source. Your table will cut any clay when it does ours so successfully, as our shale is very hard to reduce to powder, therefore, it is very coarse and very short. We have made no mistake in putting in your table. We are making 45,000 to 50,000 brick per day, and as far as the table is concerned it is only limited to the capacity of the Brick Machine, and needs no expert to run it. We will be quite willing to show your table to any one that may visit us for that purpose, as I hope to make 100,000 per day this season.

LA PRAIRIE BRICK CO.
WM. BAILLIE, Supt.

The manufacturers of this table do not guarantee it to do as good work as any other, but BETTER WORK—they guarantee it to deliver on the off-bearing belt, better, smoother faced, sharper edged brick than can be produced by any other brick cutter ever made.

A full line of "Stiff Mud" Brick Machinery.
Also "Soft Mud" Brick Machinery, both Steam and Horse Power.
Write us for Catalogue of the **best** brick machinery built.

J. D. FATE & CO.,

Manufacturers of

BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

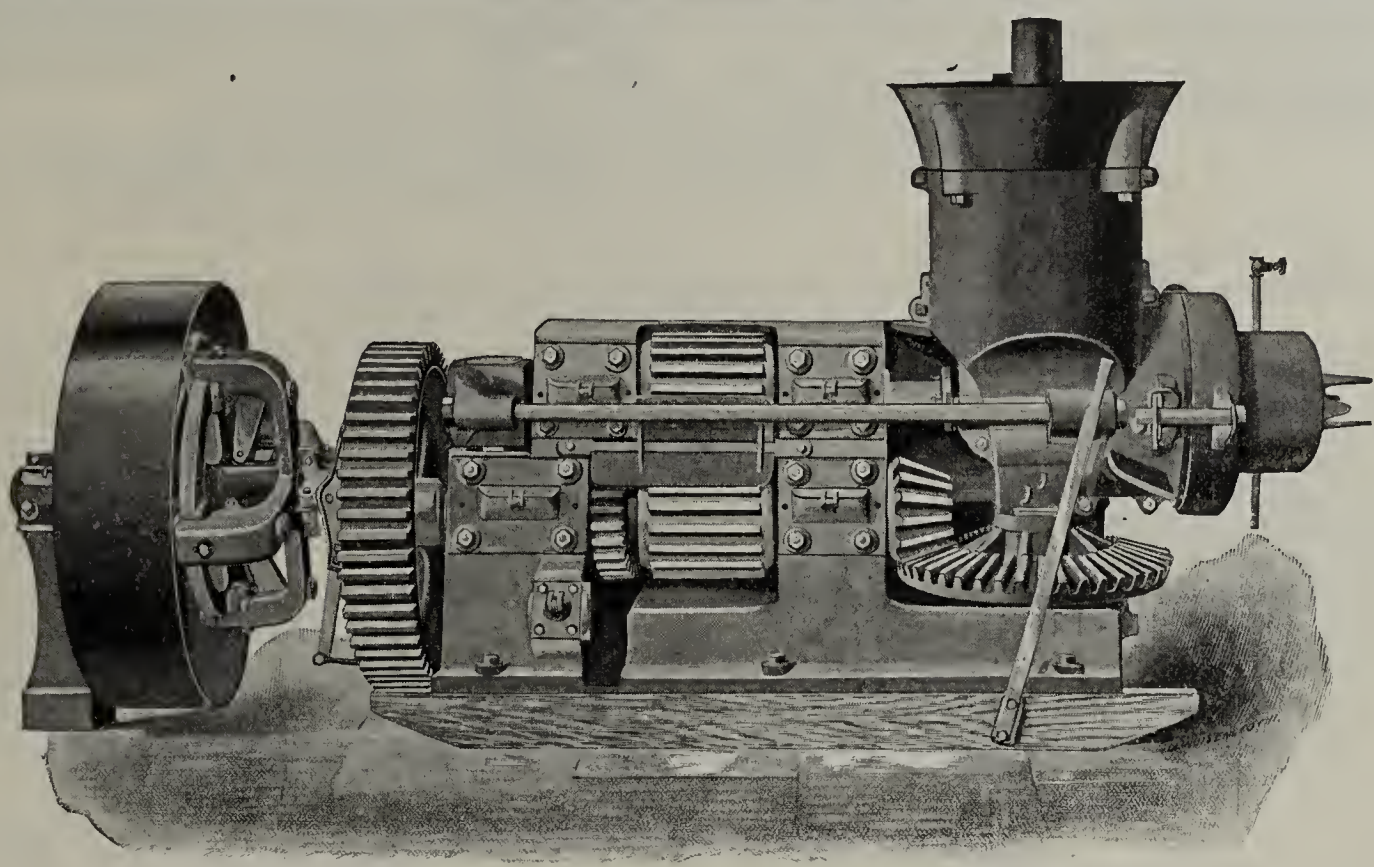
Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.
Agent for Virginia and North Carolina: H. L. JACOBS Suffolk, Va.

Have You Troubles of Your Own.

Most brickmakers have when their clay laminates.

If you have this trouble—tell us about it—let us help you bear your burdens—buy a **Wonder Brick Machine** and your troubles cease.

Lamination completely destroyed.



Big Wonder Brick Machine.

Write for our No. 16 catalogue and Good Luck Booklet. Sent free on application.

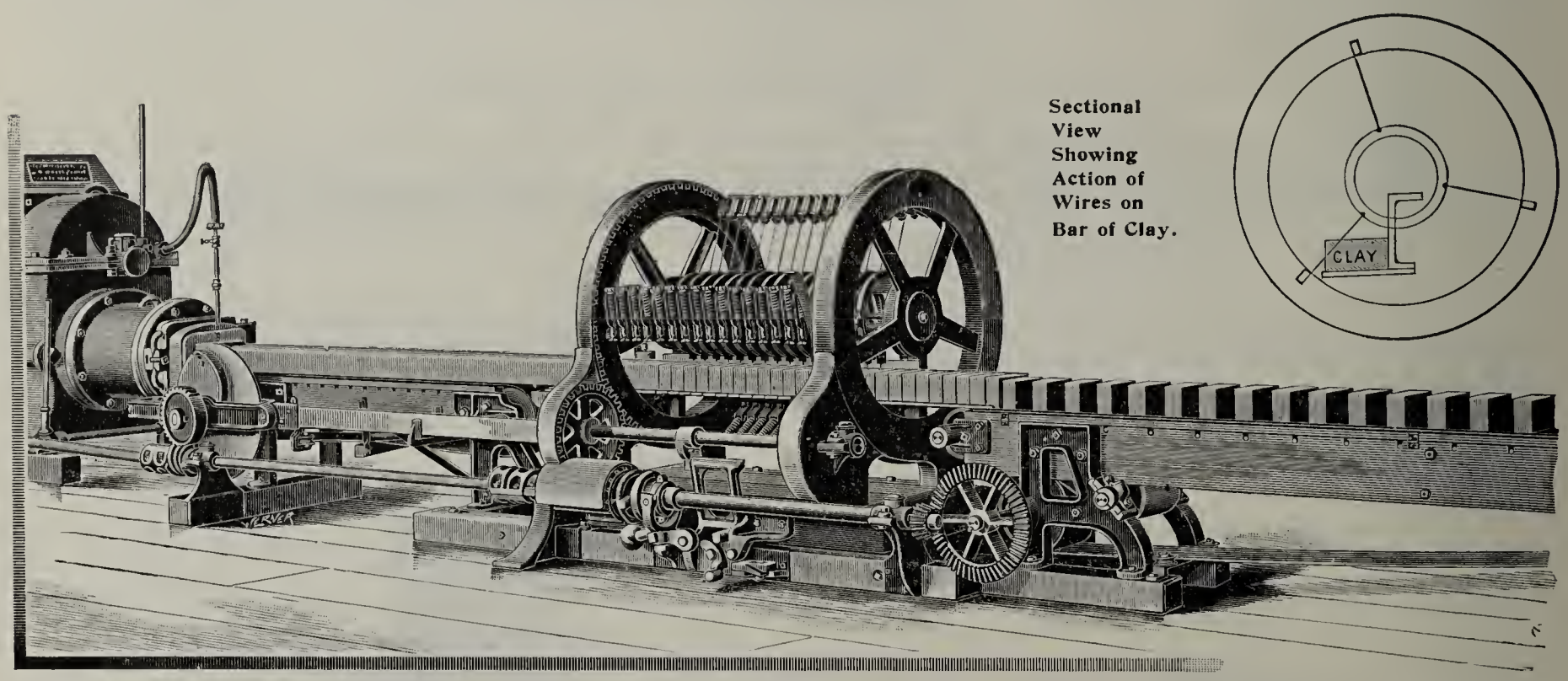
The Wallace Mfg. Co.,

FRANKFORT, IND.

WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

SOUTHERN MACHINERY CO., Charlotte, N. C., Agents for Tennessee, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina and Virginia.

Merit Wins Success.



Don't Jump at Conclusions,

You Can Count on This Cutter.

As being entirely automatic and worthy of your consideration. It is driven direct and needs no auxiliary power or slip belts.

The cutting wires are short and have a downward shearing movement, which insures a clean, smooth cut.

Broken wires can easily be replaced without stopping the machine.

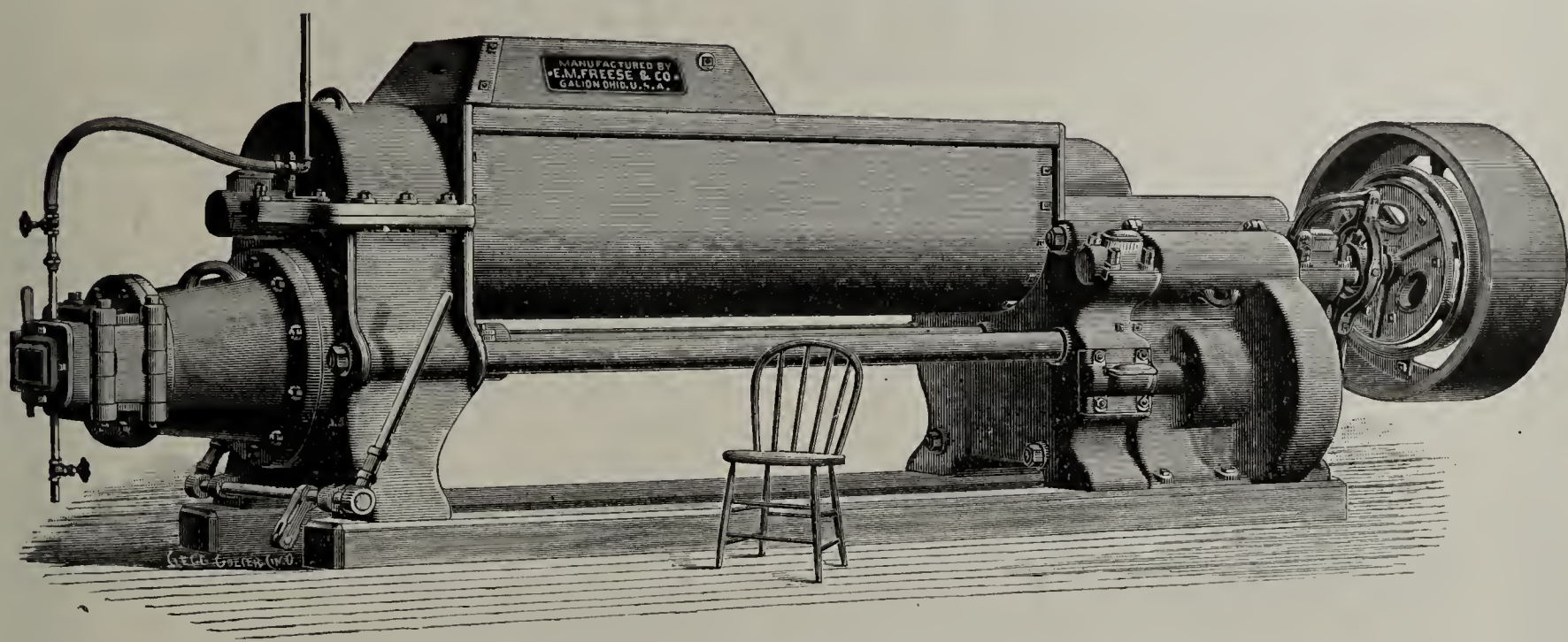
Your request for particulars is solicited.

E. M. FREESE & CO.,

Galion, Ohio.

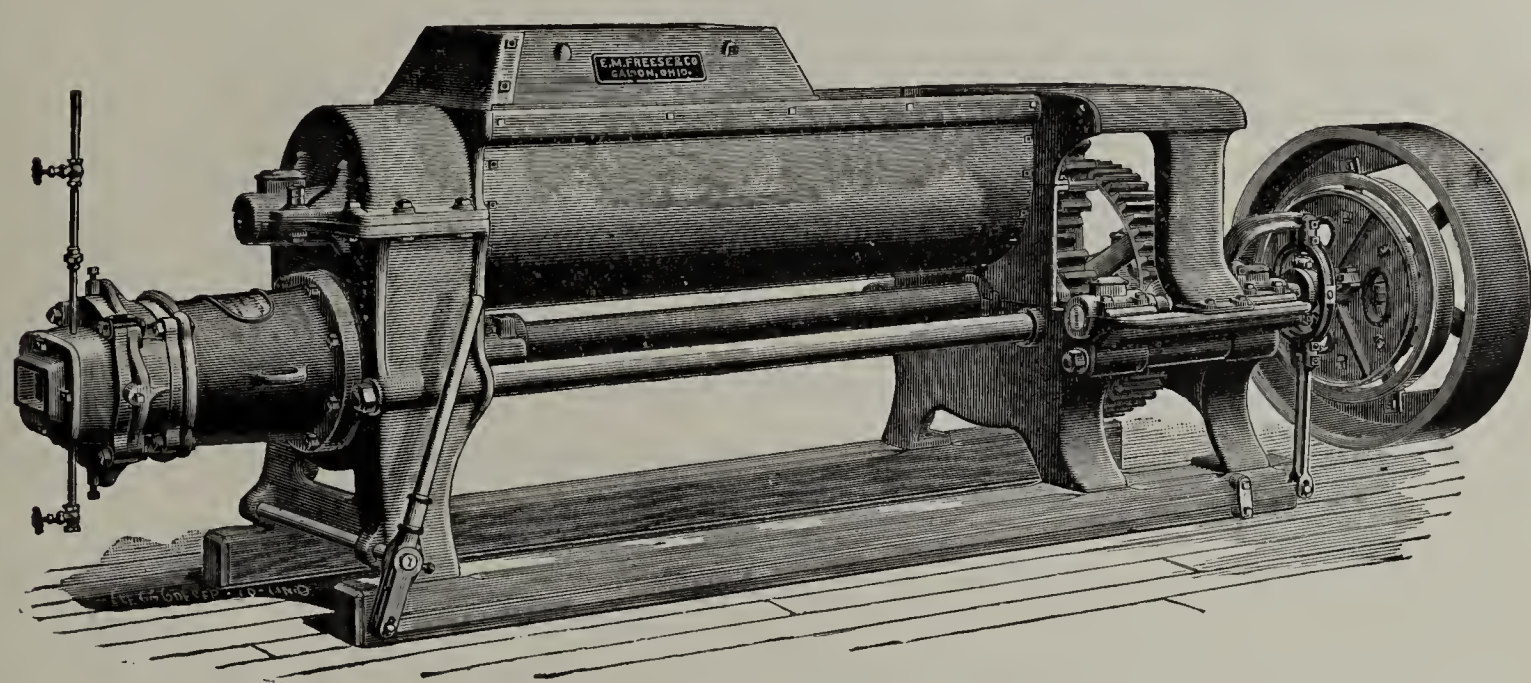
In This Union There is Strength,

AS WELL AS DURABILITY, CONVENIENCE, ECONOMY AND MANY OTHER DESIRABLE FEATURES.



SPECIAL SIZE.

Our UNION BRICK MACHINES have fairly EARNED their reputation for Excellence.



No. 1 SIZE.

BUILT IN FOUR SIZES. Daily Capacity 20,000 to 80,000.

WHAT ARE THE EASIEST THINGS in the World to make? Answer: Extravagant claims and a mistake in selecting a Brick Machine.

Those who bought our Machines made no mistake. They will tell you so. Among them are some of the most prominent brick manufacturers.

Write us for particulars.

E. M. FREESE & CO.,
Galion, Ohio.

Some of the Articles we Make

Horizontal ... Vertical Brick Machines

CLAY GRANULATORS,
PUG MILLS,
CLAY ELEVATORS,
CLAY CARS,
REVOLVING DUMP TABLES,
TEMPERED STEEL BRICK STRIKES,
KILN CASTINGS
AND OTHER CASTINGS.

Friction Winding Machines,
Friction Clutches,
Friction Clutch Pulleys,
Friction Cut-off Couplings.

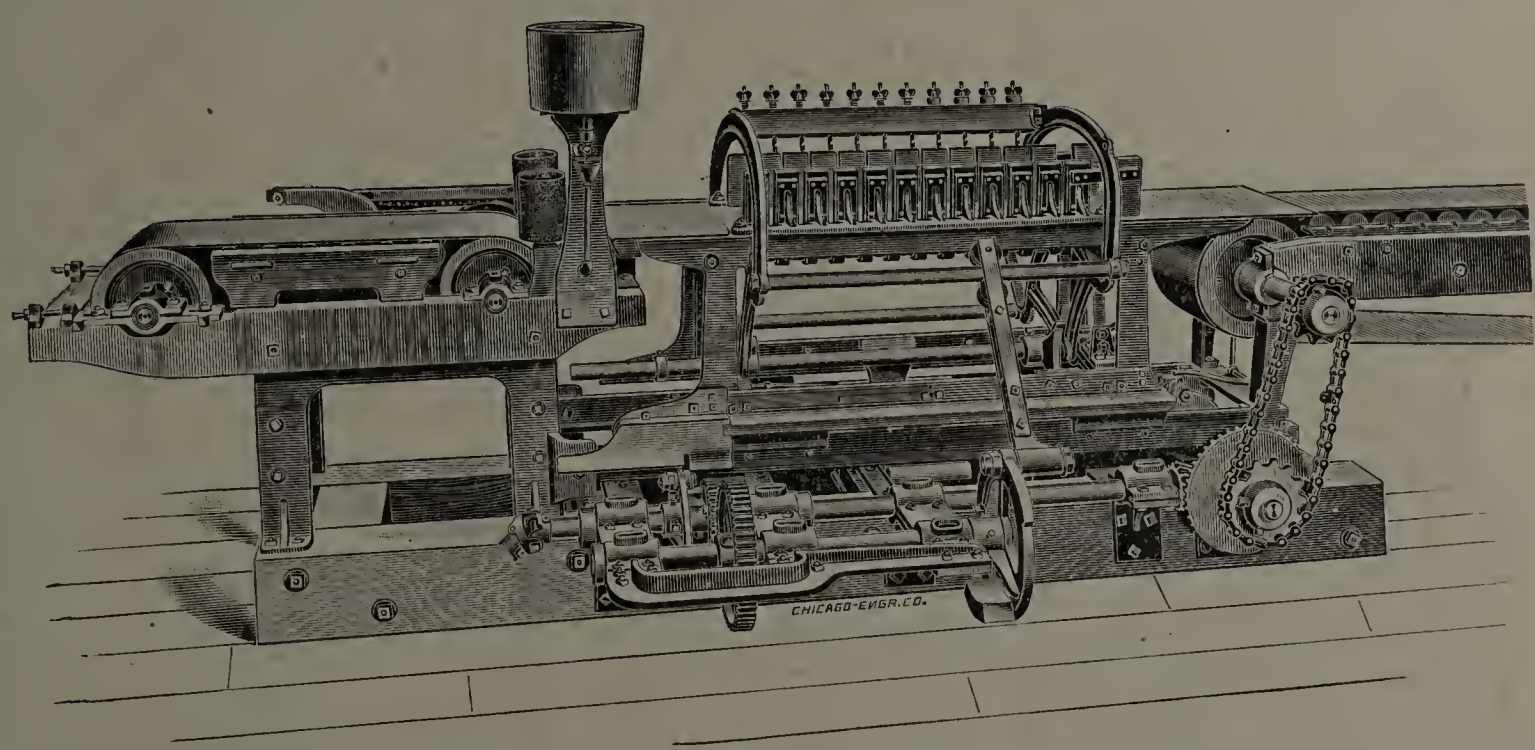
POWER FREIGHT ELEVATORS,
HOISTING MACHINES
AND SOME OTHER THINGS.

Have printed descriptive sheets describing many of these articles, which we will be happy to furnish, with prices on application. It's not our aim to build the cheapest but we do try to build the best. BETTER INVESTIGATE THEM.

The Eastern Machinery Co.,
NEW HAVEN, CONN.

Three in One Town.

How's that for an infant two seasons old? We now have three of our **No. 60 Full Automatic Brick Cutters** at work in Mason City, Ia. We sold one, that one sold the second and the first two sold the third. Brickmakers see 'em, like 'em, buy 'em, and that's all there is to it.



The BREWER No. 60 AUTOMATIC CUTTER.

Why? Because it's simple and has few parts. Because there isn't any little do-dads about it that have to be taken to a watchmaker to be fixed. Because any brickmaker can see through the whole thing in about ten minutes. Because it runs quietly and smoothly without any rattle-ti-bang busi- that knocks a machine out in about three months.

Always ready and doing; from dawn to dusk, from start to finish, from whistle to whistle; putting money into the pocket of the user and making his muddy old brickyard seem like a reserved seat in Paradise.

Catalogs and Information for the asking.

H. BREWER & CO., *Tecumseh, Mich., U. S. A.*

The Rome Brick Co., Rome, Ga., writes:

"Replying to your request under date of 26th ult. for a testimonial in regard to you system of drying brick, we cheerfully bear testimony to the fact that your apparatus installed about the first of April last is doing all that your company claimed for it.

During the interval mentioned, we have been hampered somewhat with insufficient boiler power, but this deficiency in no wise militated against the working of your drying system, only it did not give us the best results obtainable We : re now placing a boiler of 250 h. p. as against 150 h. p., and when we start up, we know positively that every claim which you advanced will be more than fulfilled.

We have been contemplating this method of drying our brick for several years, but until we investigated your plans, we were not satisfied of the perfect utility of the tunnel system advocated by other companies, but we would not change back for twice the cost of your dryer to our former way of drying brick. The cost test we have not fully tried, but later if you desire figures on this line, we will gladly furnish them."

American Blower Company,
Detroit, Michigan.
New York. Chicago. London.

All Railway Materials

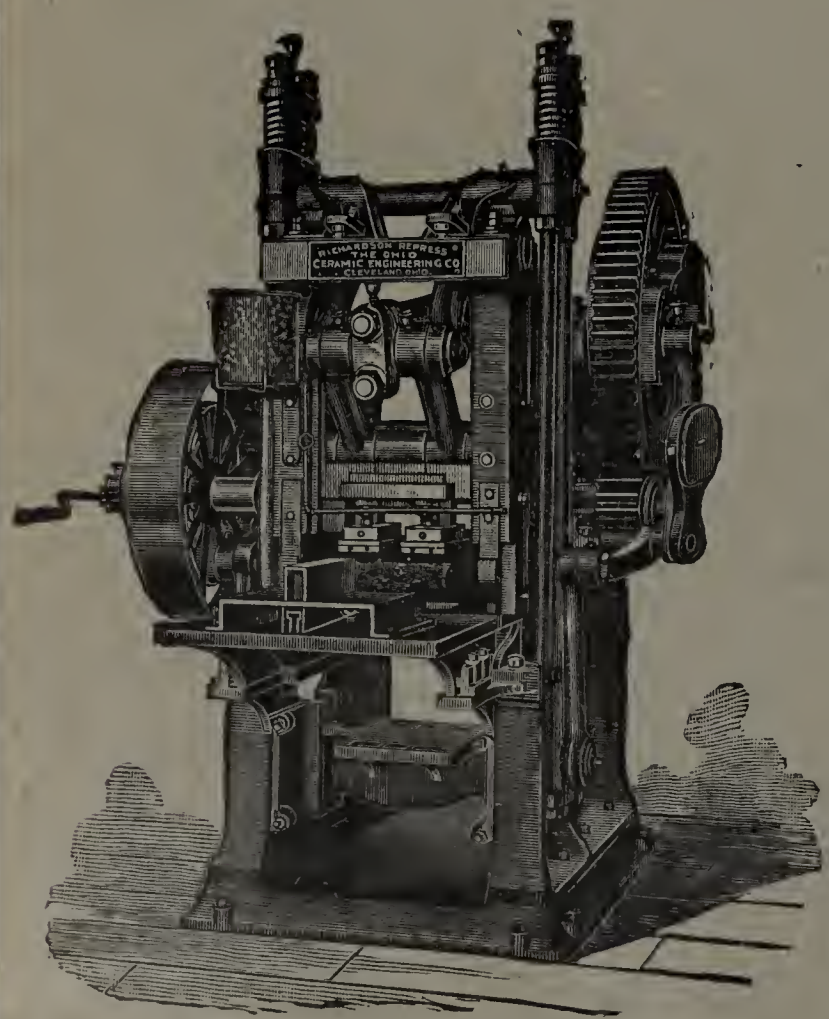
For Brickyards and Clay Mines, Cement, Lime Works, Quarries, Etc.

CARS of all Types, Styles and Capacities.
RAILS of all weights with accesories.
Switches, Frogs, Wheels, Axles, Turntables, Bolts and Spikes.

ALWAYS IN STOCK

Write for Catalogues and Prices.

ARTHUR KOPPEL, New York,
66 and 68 Broad St.



The RICHARDSON REPRESS.

IF YOU GIVE THEM A CHANCE, OUR REPRESSES AND OTHER MACHINES WILL SPEAK FOR THEMSELVES AND FOR US. SEND FOR CATALOGUE.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

UNIVERSITY OF ILLINOIS-URBANA
3 0112 052630032